

# Initial Microprobe Setup

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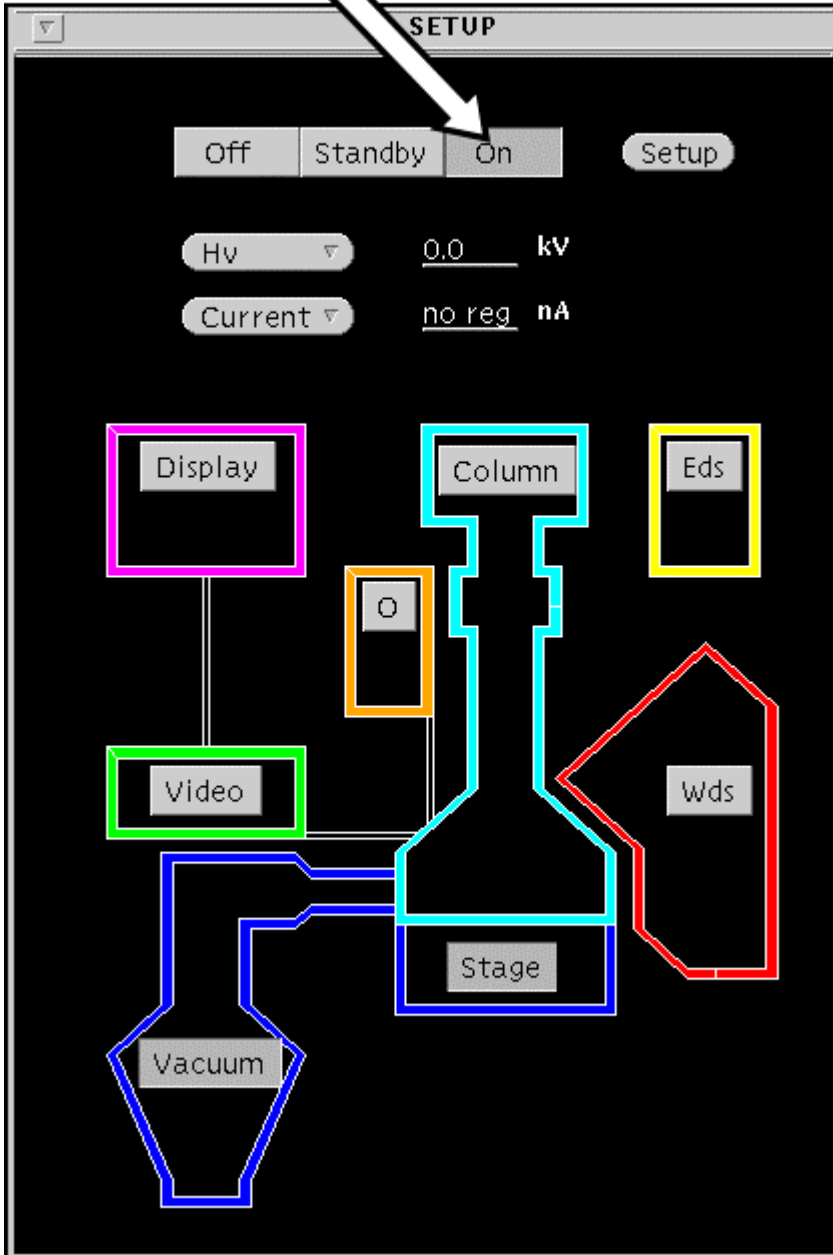
Kenneth Domanik  
Electron Microprobe Laboratory Manager  
Lunar and Planetary Laboratory  
University of Arizona  
May 2005

Note: These instructions reflect current procedures in our lab on our Cameca SX50 only.

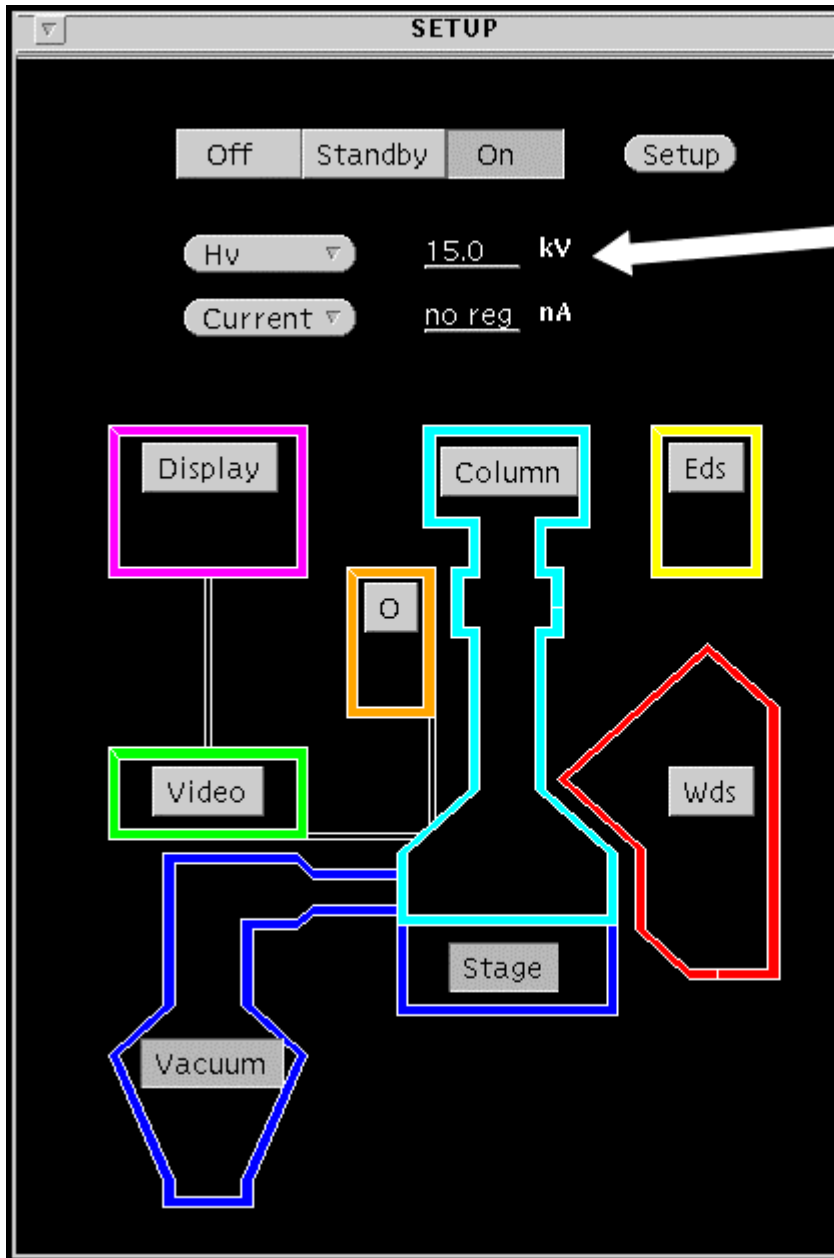
# **1: Start the Beam**

# Step 1

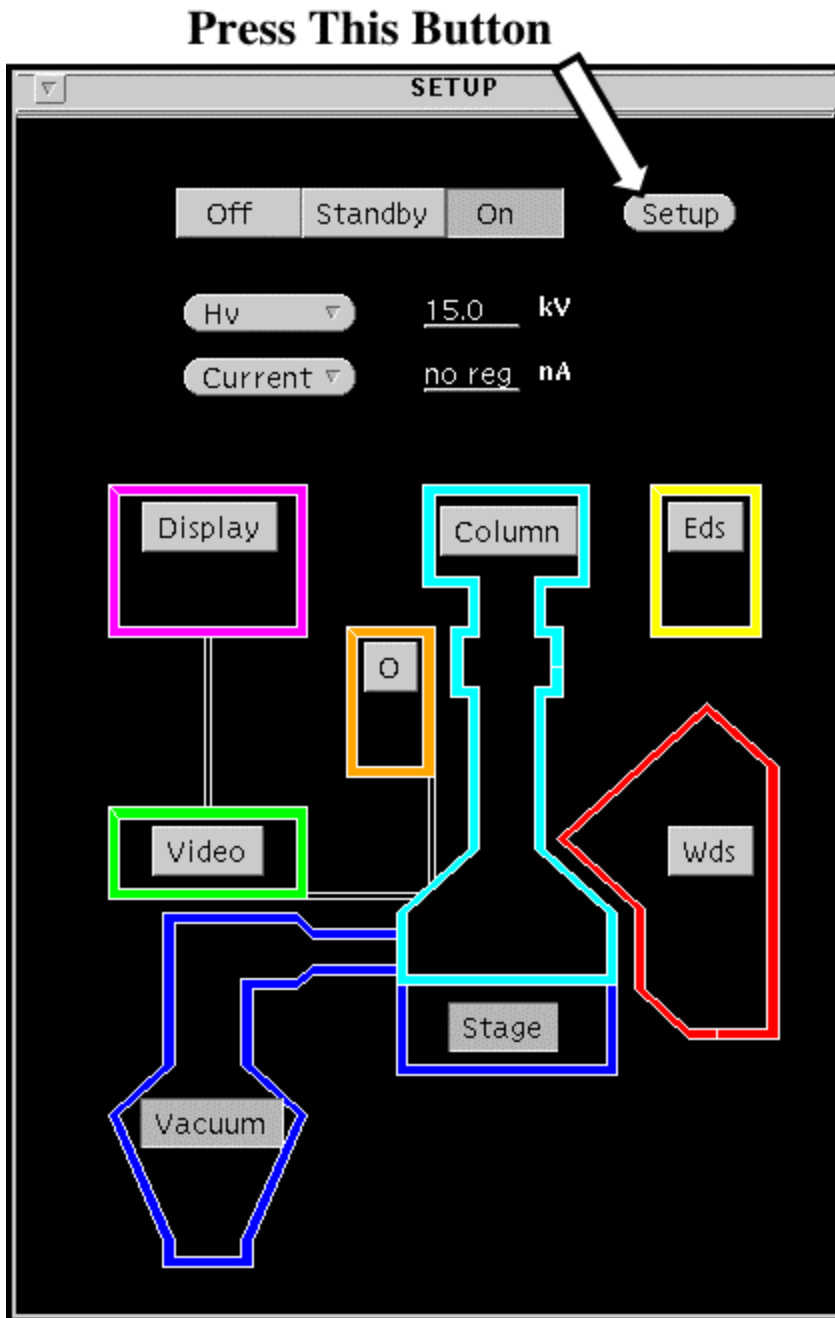
**Press This Button**



## Step 2



### Step 3



## Step 4

Click on  
HV15

SAVE/LOAD SETUP FILES

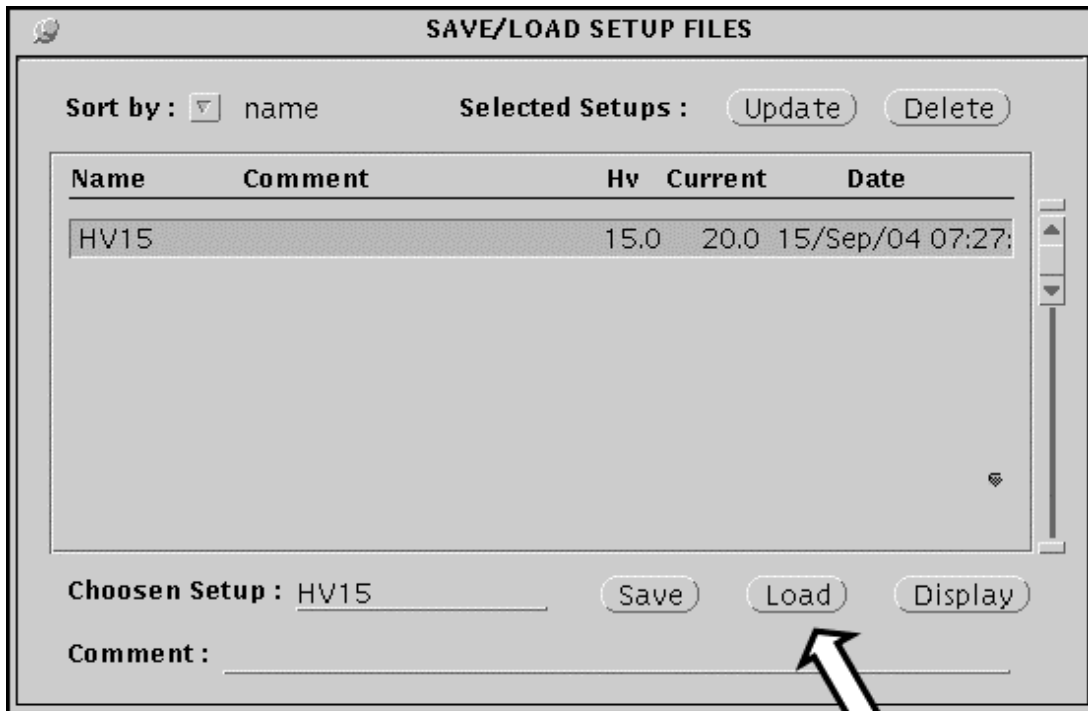
Sort by:  Selected Setups:

Name	Comment	Hv	Current	Date
HV15		15.0	20.0	15/Sep/04 07:27:

Chosen Setup : \_\_\_\_\_

Comment : \_\_\_\_\_

## Step 5



**Press This Button**

## Step 6

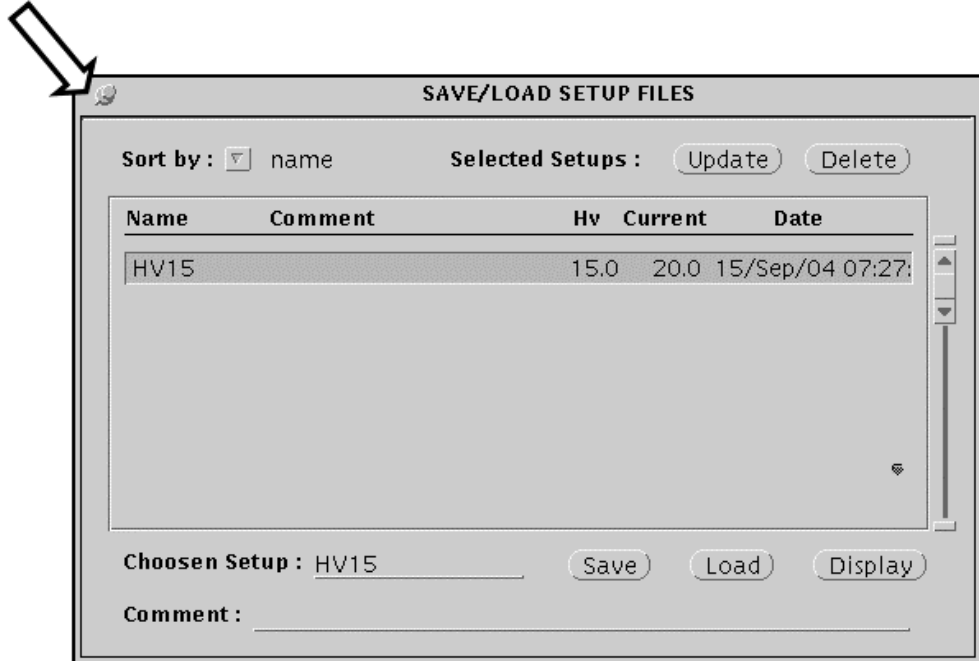


**Wait for this message to appear.**

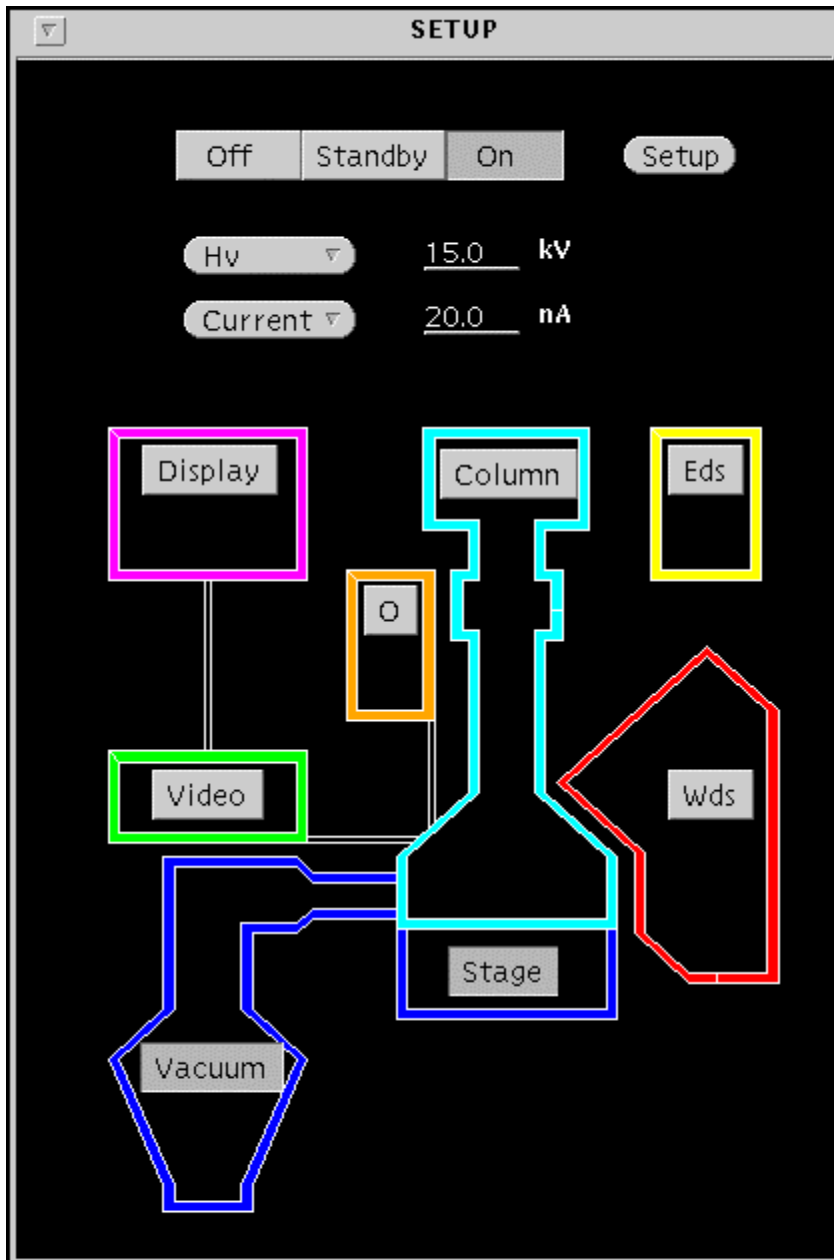


## Step 7

Click this pin  
to close window



## Step 8

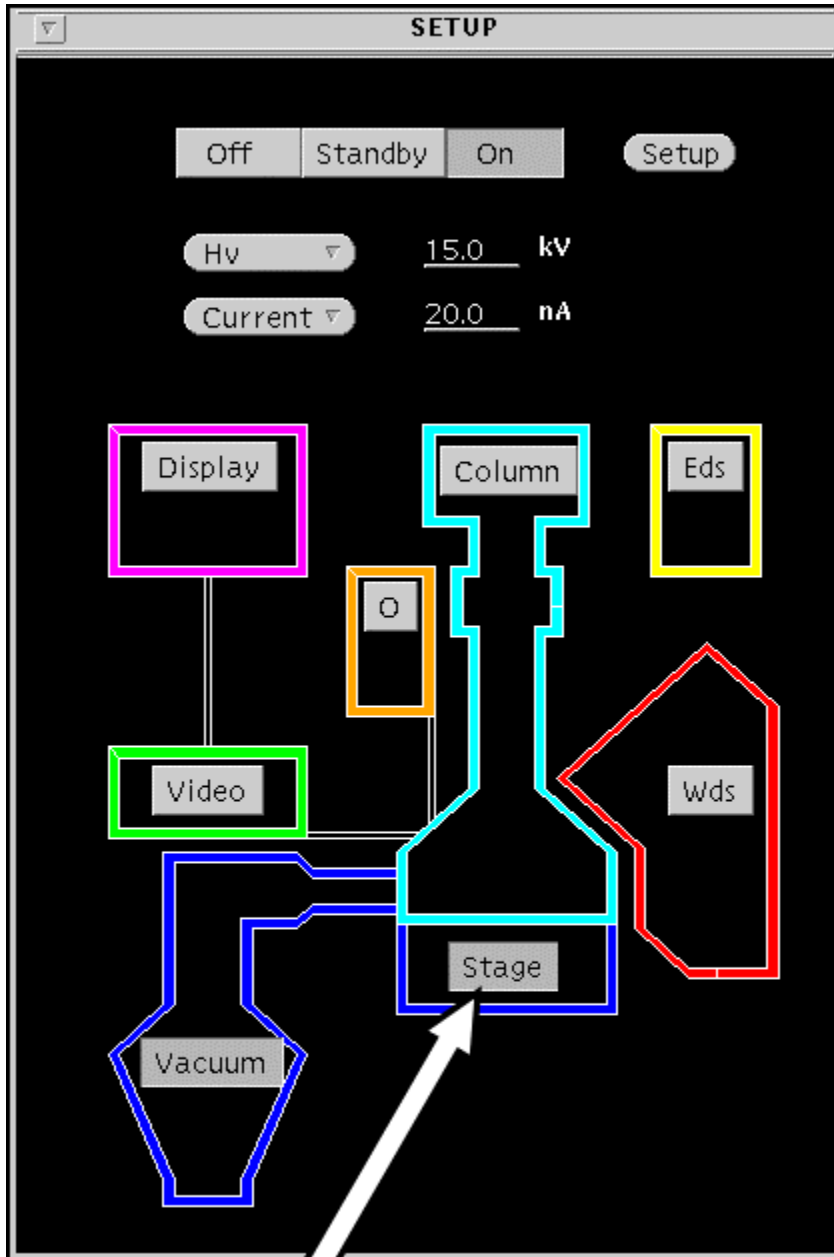


**Beam On  
Ready for Next Step**

## **2: Verify the Stage Position**

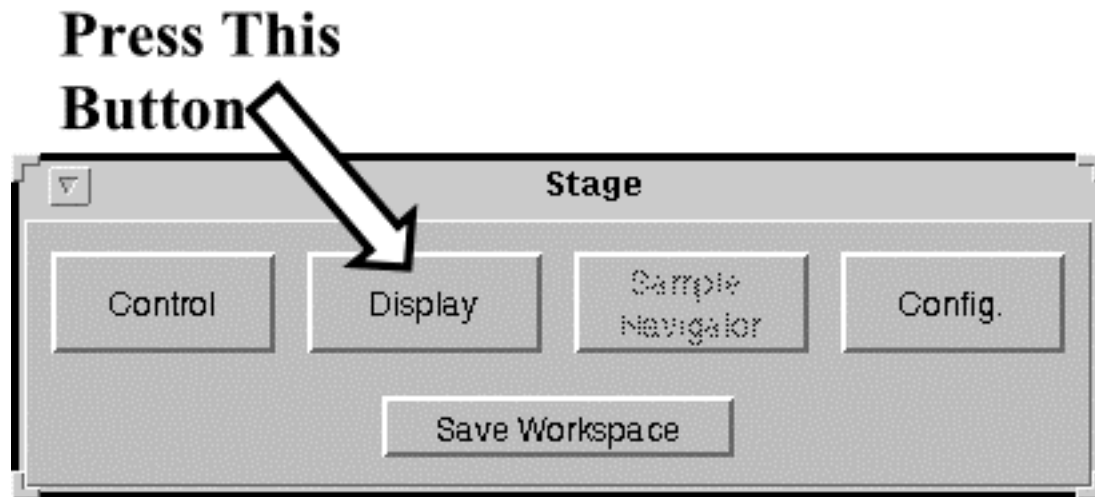
## Step 1

If the Stage window is not already open:



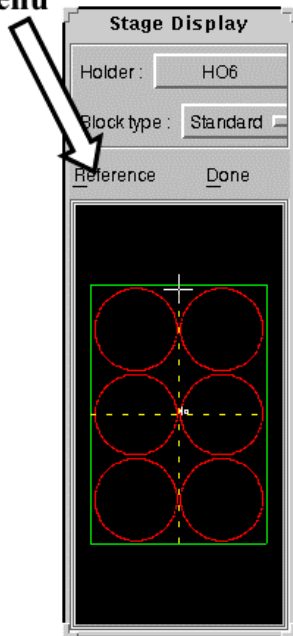
**Press This  
Button**

## Step 2



## Step 3

**R-Click and select:  
MOVE STAGE TO REFERENCE  
from the menu**



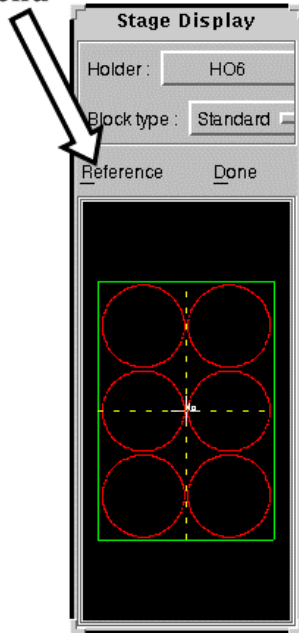
Then:

**On the reflected light image, focus the image of the stage center pin and center it in the crosshairs.**



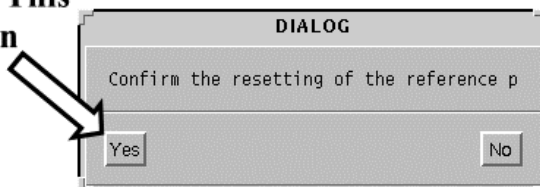
## Step 4

**R-Click and select:**  
**SET STAGE REFERENCE**  
from the menu



**Then:**

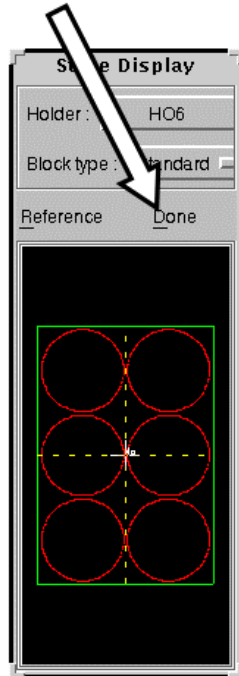
**Press This  
Button**





## Step 5

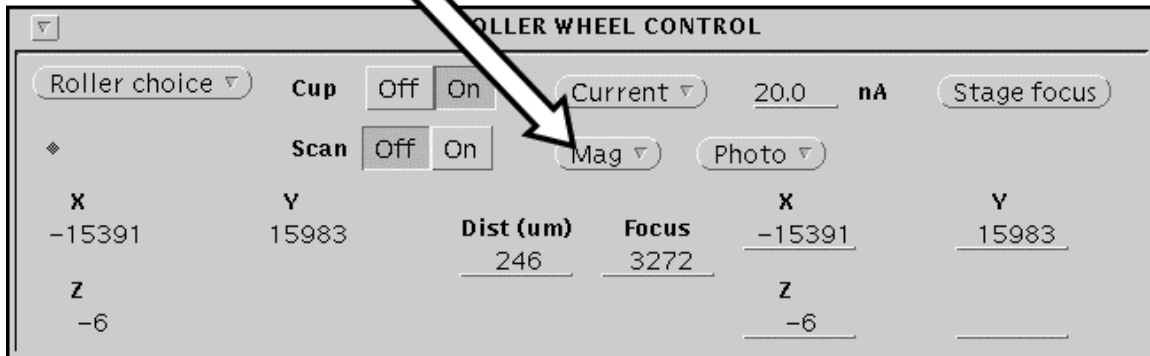
**Press This  
Button  
To close window**



### **3: Turn On Secondary Electron Imaging (If not already on)**

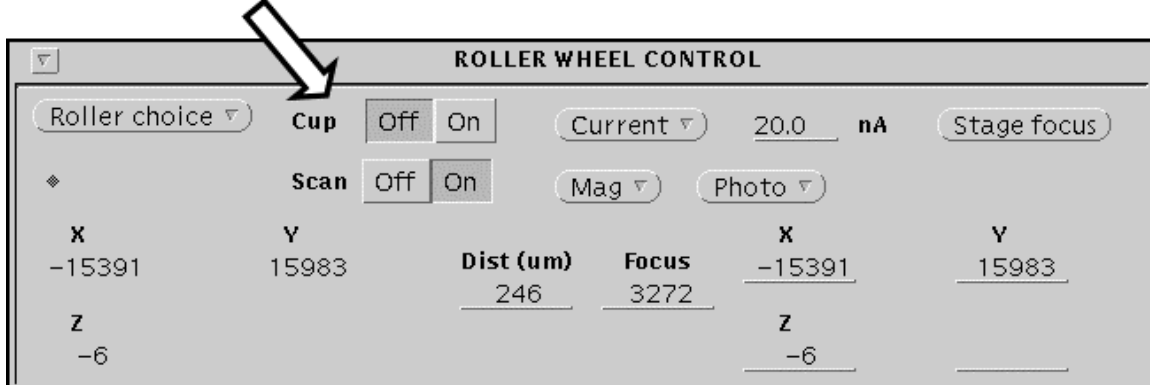
## Step 1

**R-Click and select MIN from menu.**

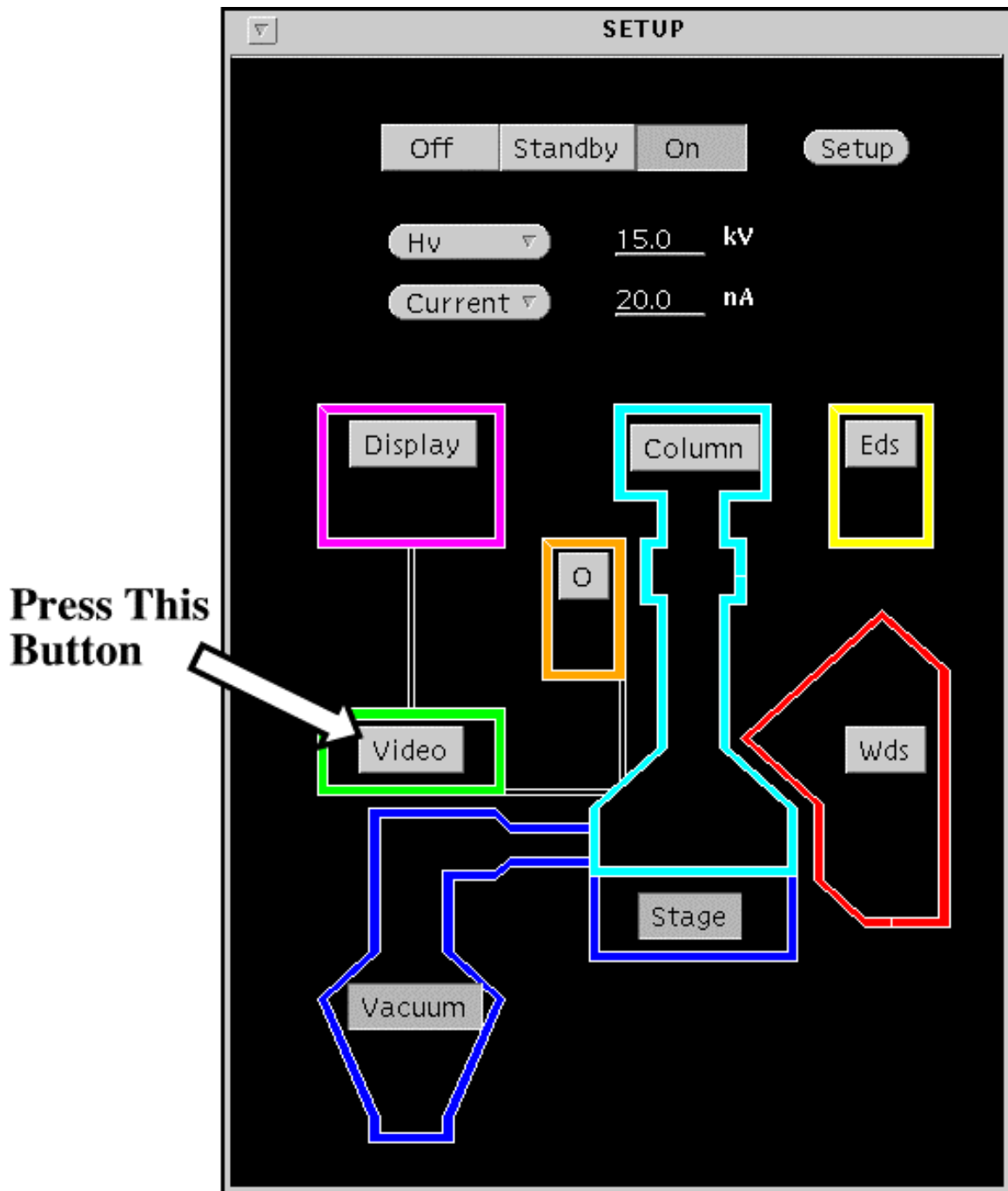


**Then:**

**Turn the Cup Off and  
Turn the Scan On**

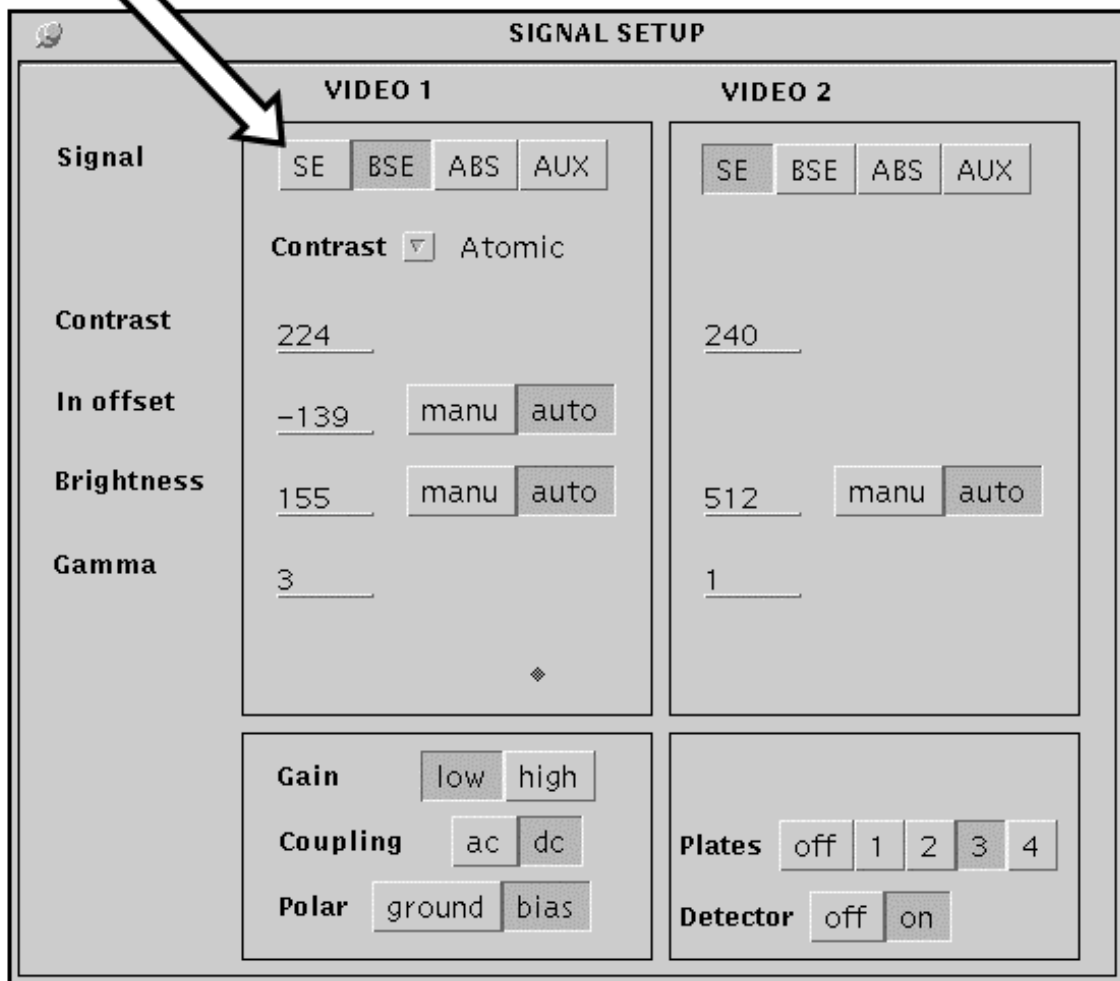


## Step 2



### Step 3

**Press This Button**



The image shows a 'SIGNAL SETUP' menu with two columns for VIDEO 1 and VIDEO 2. An arrow points to the 'SE' button in the VIDEO 1 signal selection row.

	VIDEO 1	VIDEO 2
<b>Signal</b>	<input checked="" type="button" value="SE"/> <input type="button" value="BSE"/> <input type="button" value="ABS"/> <input type="button" value="AUX"/>	<input checked="" type="button" value="SE"/> <input type="button" value="BSE"/> <input type="button" value="ABS"/> <input type="button" value="AUX"/>
<b>Contrast</b>	Contrast <input type="button" value="v"/> Atomic 224	240
<b>In offset</b>	-139 <input type="button" value="manu"/> <input type="button" value="auto"/>	
<b>Brightness</b>	155 <input type="button" value="manu"/> <input type="button" value="auto"/>	512 <input type="button" value="manu"/> <input type="button" value="auto"/>
<b>Gamma</b>	3	1
<b>Gain</b>	<input type="button" value="low"/> <input type="button" value="high"/>	
<b>Coupling</b>	<input type="button" value="ac"/> <input type="button" value="dc"/>	
<b>Polar</b>	<input type="button" value="ground"/> <input type="button" value="bias"/>	
<b>Plates</b>		<input type="button" value="off"/> <input type="button" value="1"/> <input type="button" value="2"/> <input checked="" type="button" value="3"/> <input type="button" value="4"/>
<b>Detector</b>		<input type="button" value="off"/> <input type="button" value="on"/>

## Step 4

**If not already  
on:**

**Press This  
Button**

**SIGNAL SETUP**

	VIDEO 1	VIDEO 2
Signal	<input type="button" value="SE"/> <input type="button" value="BSE"/> <input type="button" value="ABS"/> <input type="button" value="AUX"/>	<input type="button" value="SE"/> <input type="button" value="BSE"/> <input type="button" value="ABS"/> <input type="button" value="AUX"/>
Contrast	184	240
In offset		
Brightness	114 <input type="button" value="manu"/> <input type="button" value="auto"/>	217 <input type="button" value="manu"/> <input type="button" value="auto"/>
Gamma		1

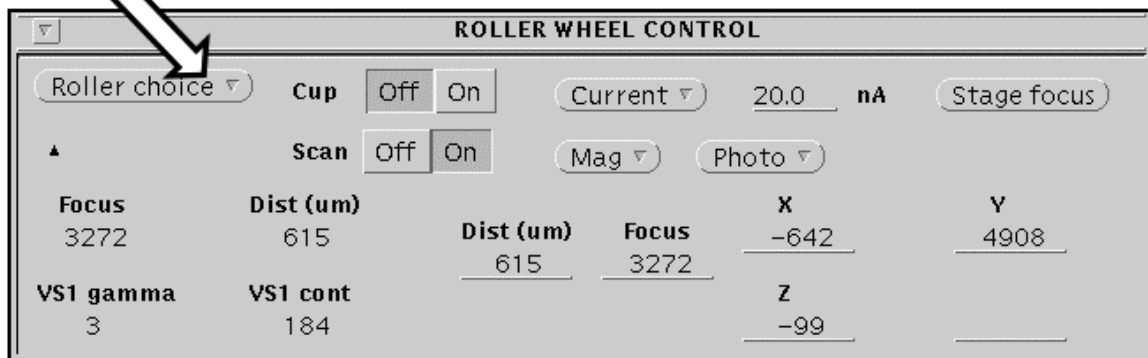
**Pm**   419

**Detec.**

**Plates**

## Step 5

**L-Click this button  
to set Roller wheels back to Stage**



**When the contrast of the SE image is done auto-adjusting**

**Then:**

Turn the **Cup On** and  
Turn the **Scan Off**

ROLLER WHEEL CONTROL

Roller choice ▾ **Cup** Off On Current ▾ 20.0 nA Stage focus

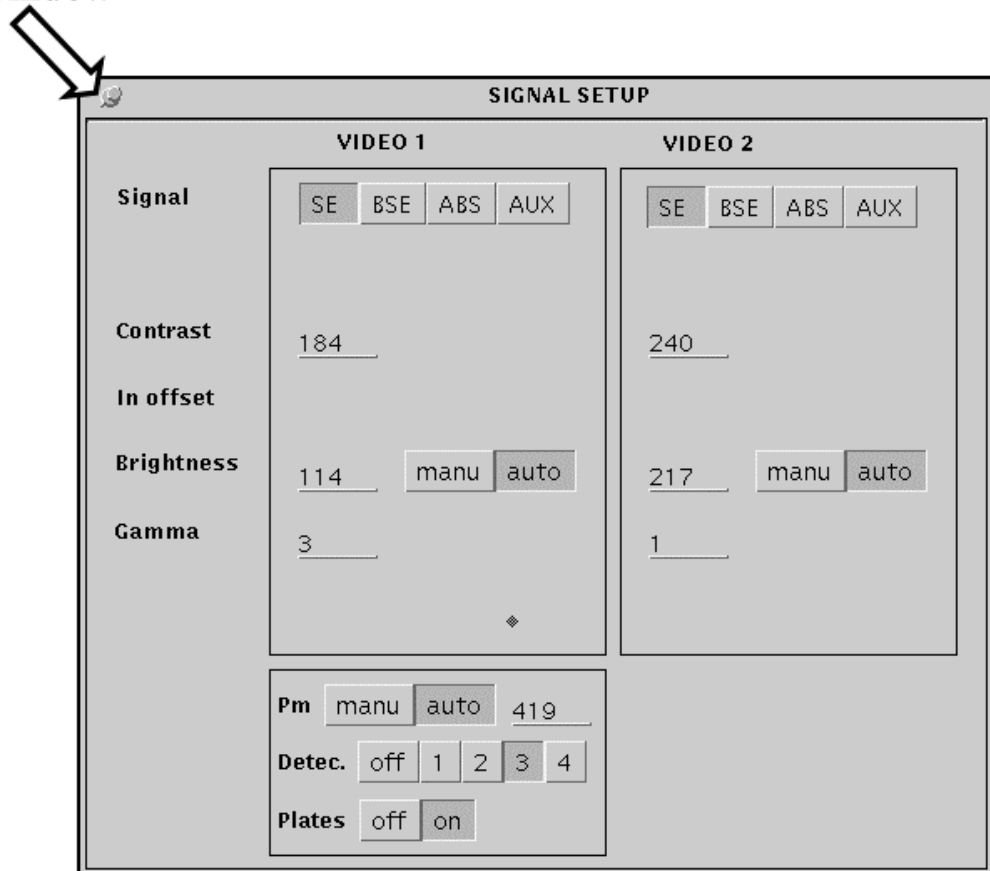
◆ Scan Off On Mag ▾ Photo ▾

<b>X</b>	<b>Y</b>	<b>Dist (um)</b>	<b>Focus</b>	<b>X</b>	<b>Y</b>
-15391	15983	246	3272	-15391	15983
<b>Z</b>				<b>Z</b>	
-6				-6	



## Step 5

Click this pin  
to close window



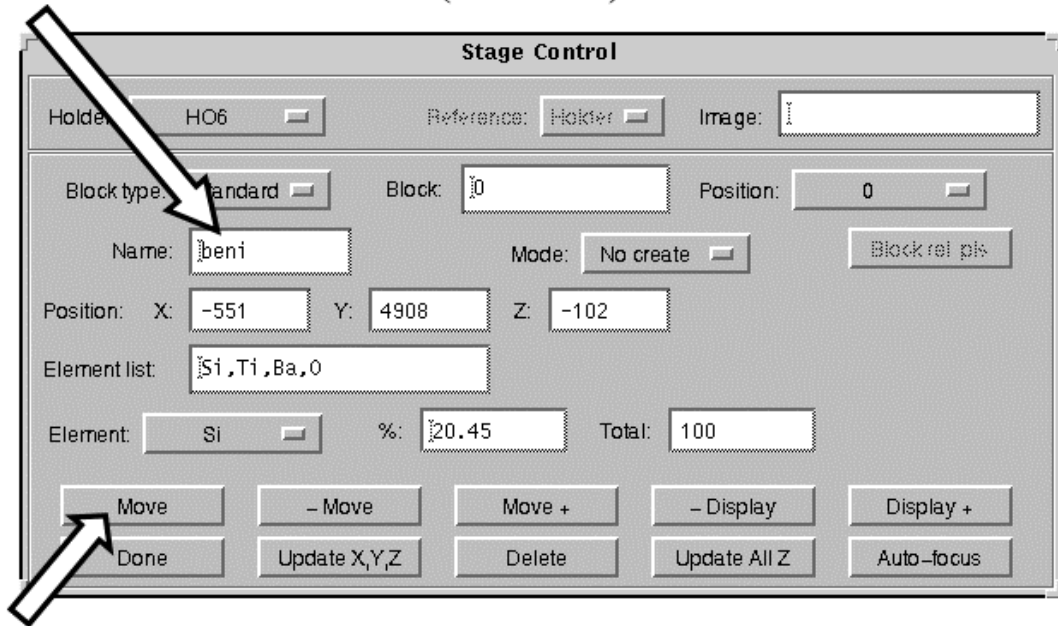
The image shows a 'SIGNAL SETUP' window with a pin icon in the top-left corner. An arrow points to this pin with the text 'Click this pin to close window'. The window is divided into two columns, 'VIDEO 1' and 'VIDEO 2', and a bottom section for common settings.

	VIDEO 1	VIDEO 2
Signal	<input type="radio"/> SE <input type="radio"/> BSE <input type="radio"/> ABS <input type="radio"/> AUX	<input type="radio"/> SE <input type="radio"/> BSE <input type="radio"/> ABS <input type="radio"/> AUX
Contrast	<input type="text" value="184"/>	<input type="text" value="240"/>
In offset		
Brightness	<input type="text" value="114"/> <input type="radio"/> manu <input type="radio"/> auto	<input type="text" value="217"/> <input type="radio"/> manu <input type="radio"/> auto
Gamma	<input type="text" value="3"/>	<input type="text" value="1"/>
◆		
Pm	<input type="radio"/> manu <input type="radio"/> auto	<input type="text" value="419"/>
Detec.	<input type="radio"/> off <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4	
Plates	<input type="radio"/> off <input type="radio"/> on	

## **4: Center Camera and Focus Electron Beam**

# Step 1

**First: R-click and Select Beni (Benitoite) Standard**



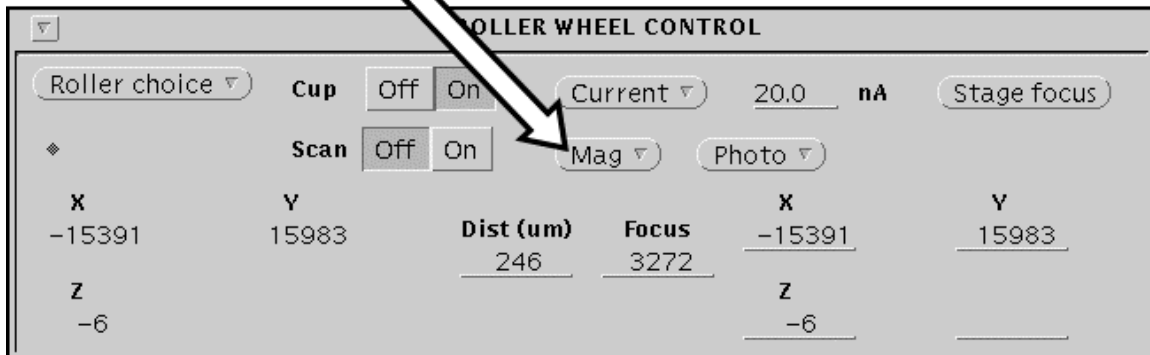
**Second: Press this Button**

## Step 2

**Optically focus the reflected light image using the Z roller wheel.**

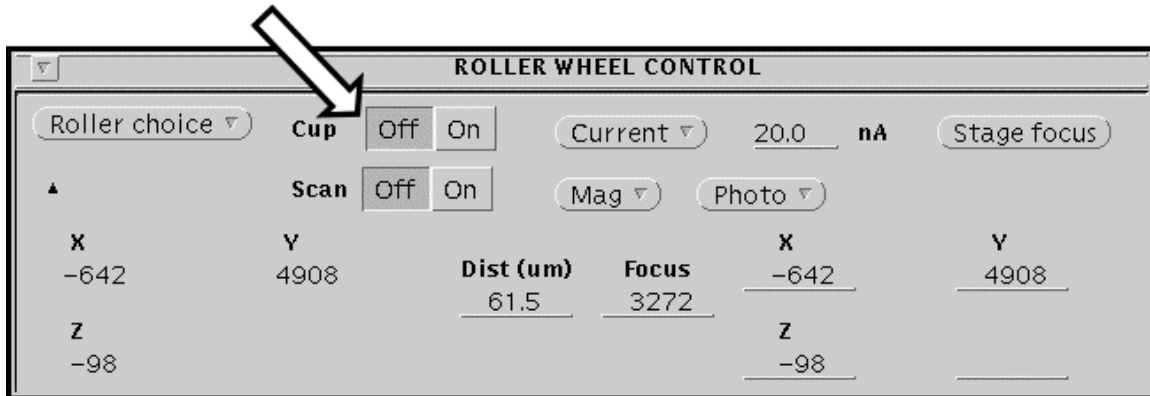
**Then:**

**R-Click and select Mag 2000 from menu.**



### Step 3

Turn the **Cup Off** and  
Turn the **Scan Off**

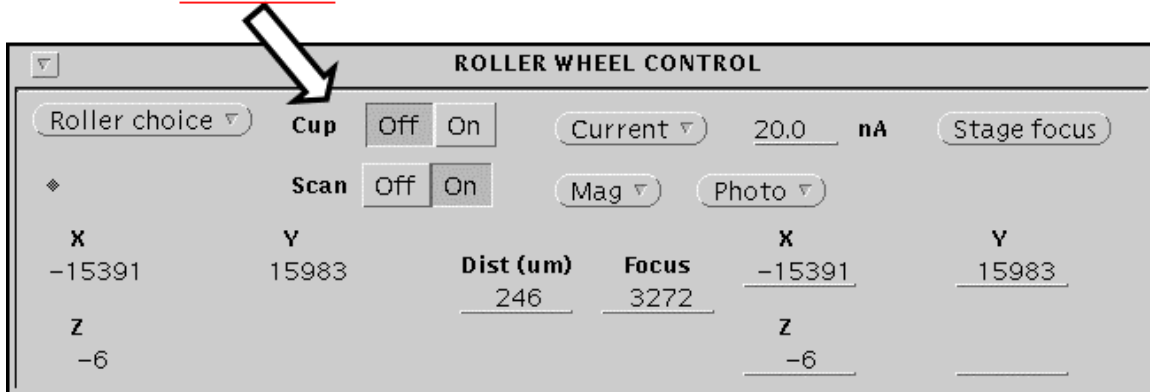


**Then:**

**Center the beam in the crosshairs on the reflected light image. Use the two allen keys located on each side of the electron column just above spectrometers 1 and 4 to adjust the CCD camera image.**

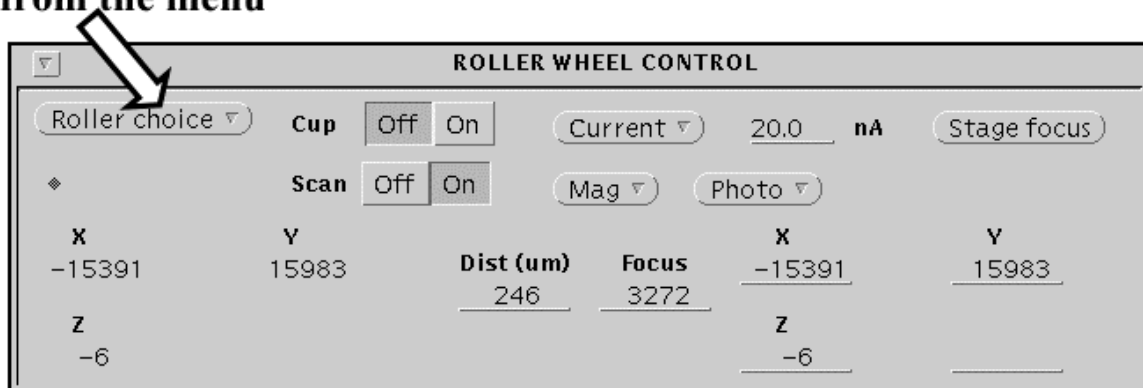
## Step 4

Turn the **Cup Off** and  
Turn the **Scan On**



Then:

R-Click this button and select **FOCUS FINE**  
from the menu

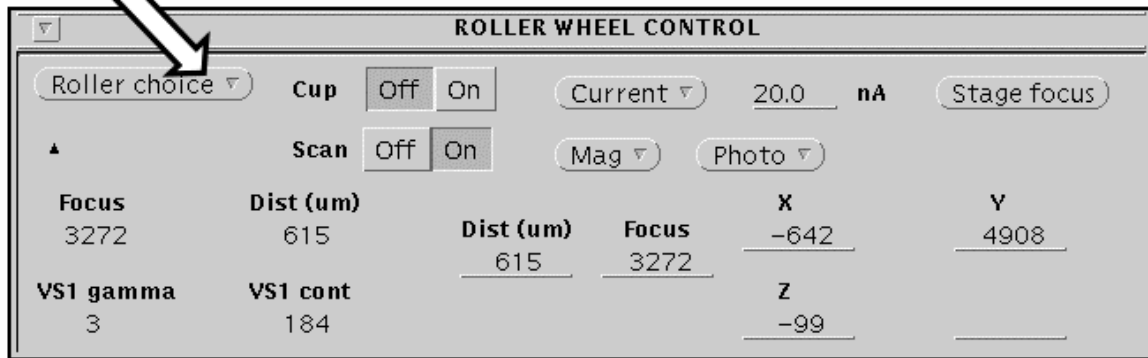


## Step 5

Find a small bright object (like a dust grain) in the SE image. Adjust the Upper Left Roller Wheel (i.e. the Focus wheel) to get the object in the sharpest focus.

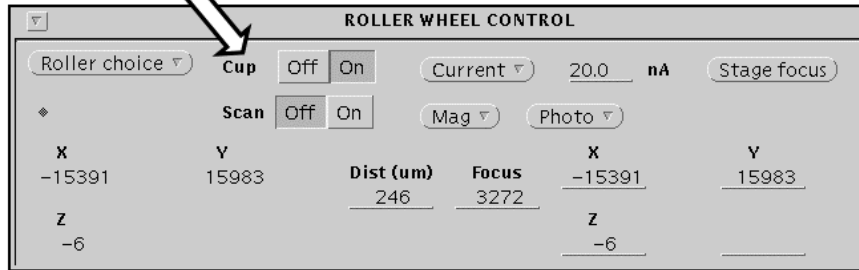
Then:

L-Click this button  
to set Roller wheels back to Stage



## Step 6

Turn the **Cup On** and  
Turn the **Scan Off**



ROLLER WHEEL CONTROL

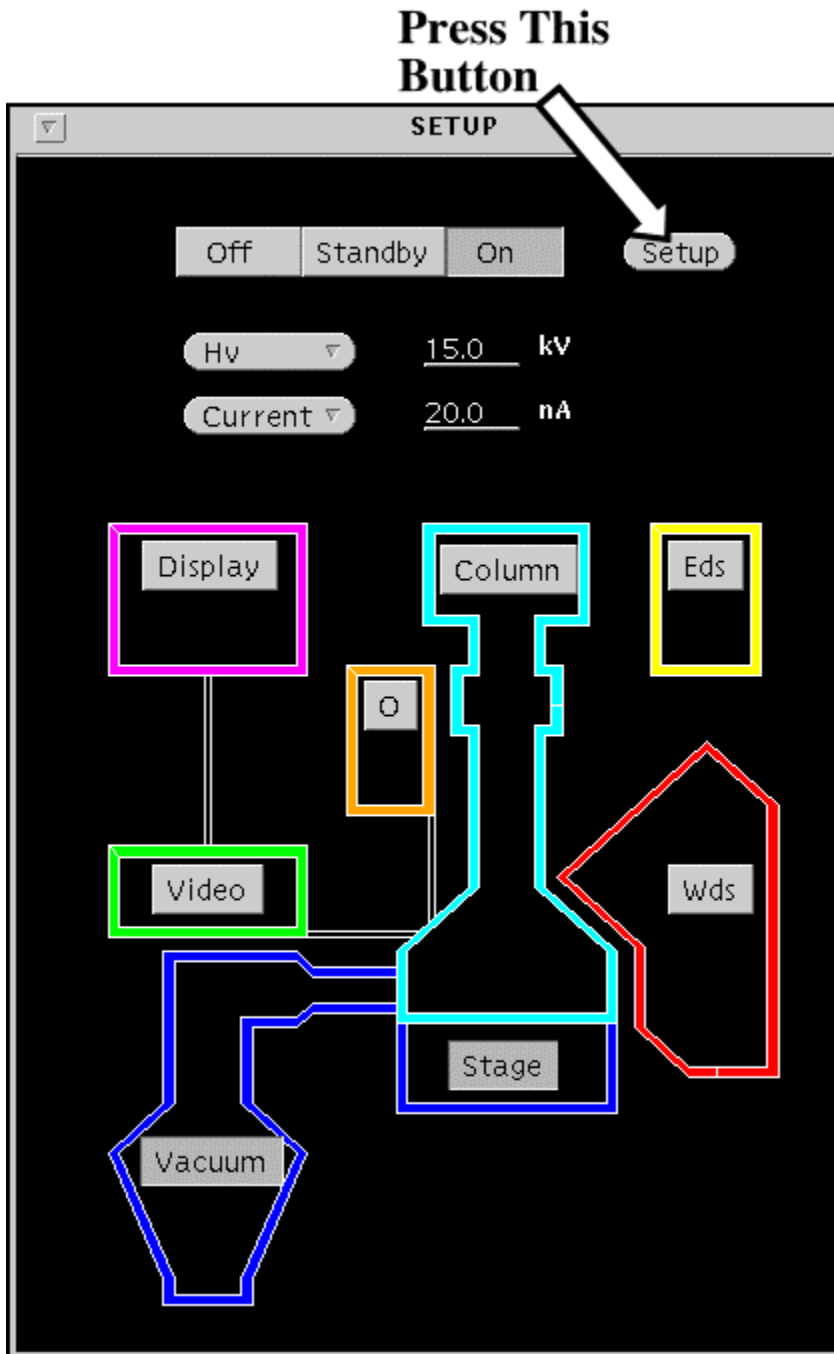
Roller choice ▾ Cup  Off  On Current ▾ 20.0 nA Stage focus

Scan  Off  On Mag ▾ Photo ▾

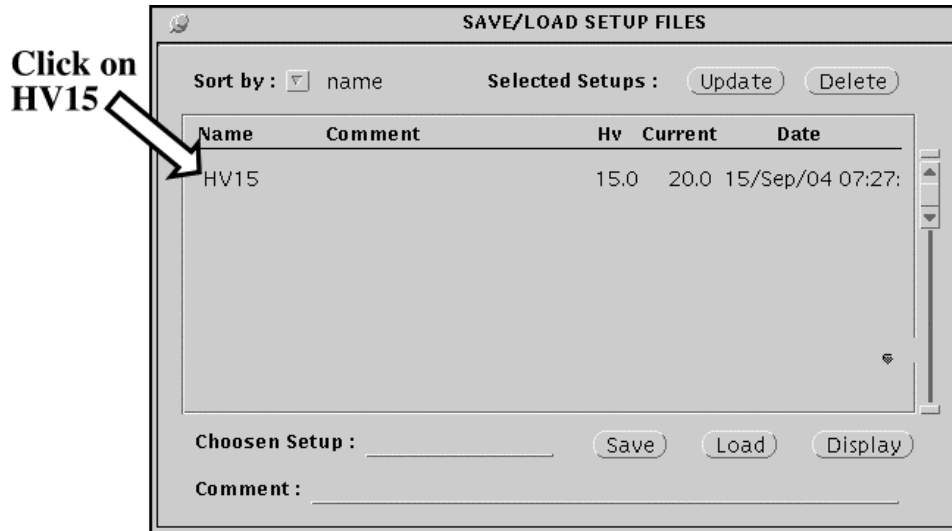
X	Y	Dist (um)	Focus	X	Y
-15391	15983	246	3272	-15391	15983
Z				Z	
-6				-6	



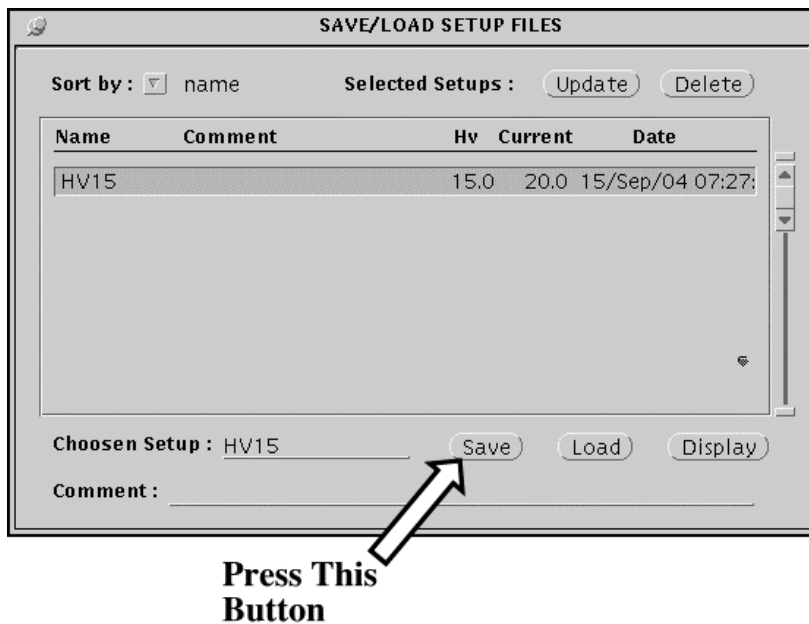
## Step 7



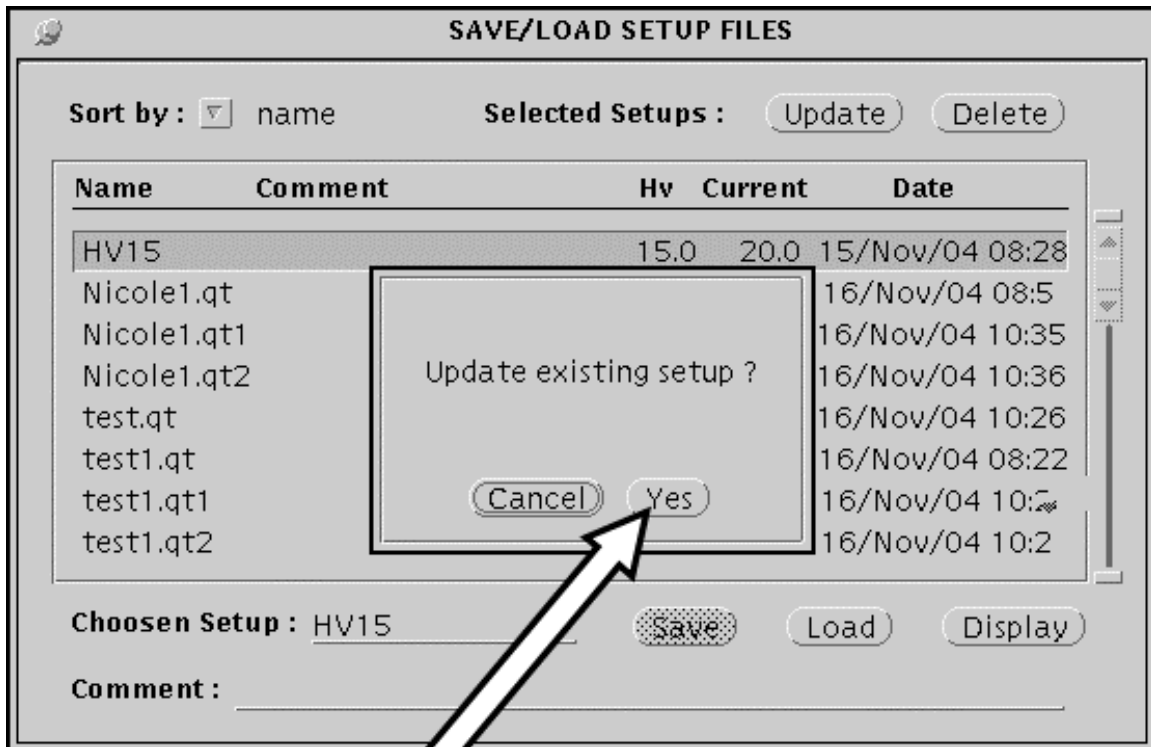
## Step 8



Then:



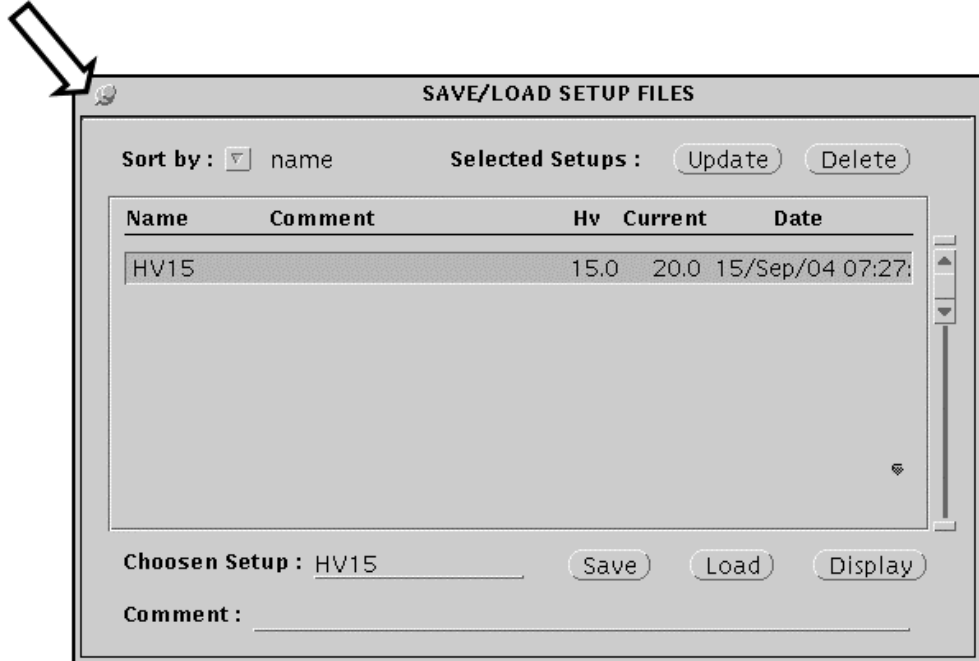
## Step 9



**Press This  
Button**

## Step 10

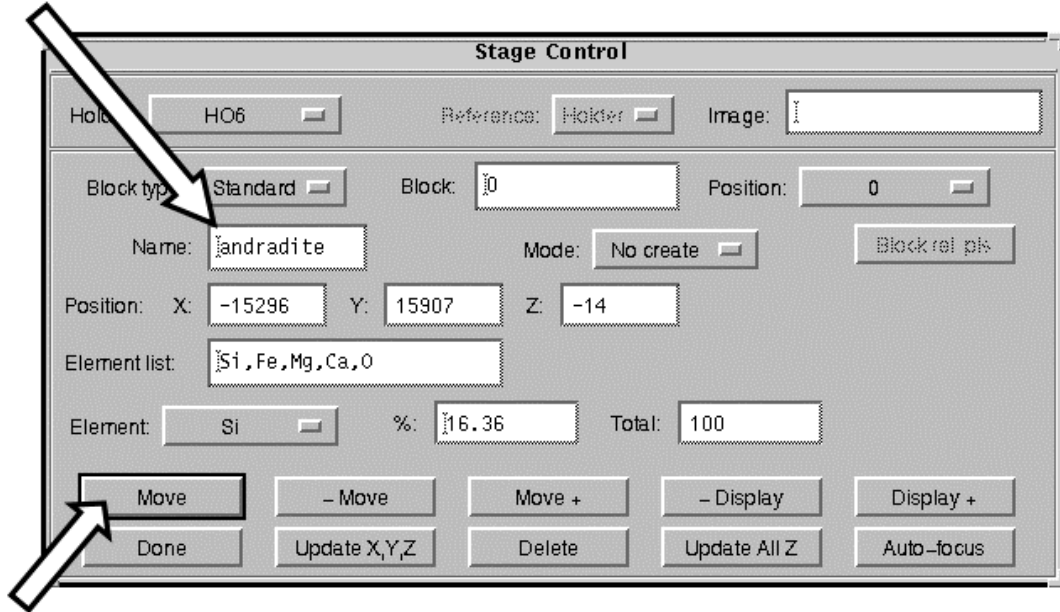
Click this pin  
to close window



## **5: Verify Spectrometers and Adjust Detector Bias**

## Step 1

**First: R-click and Select Andradite Standard**



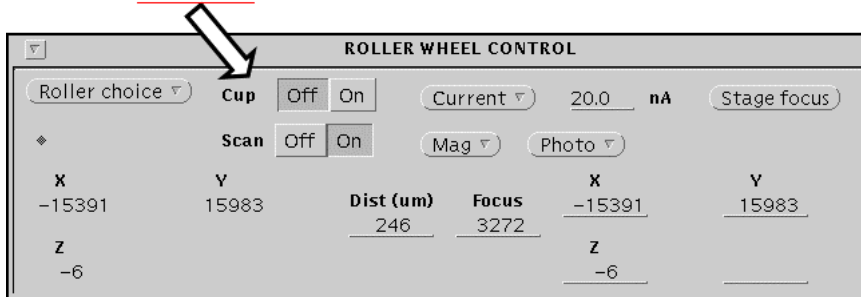
**Second: Press this Button**

## Step 2

Optically focus the reflected light image using the Z roller wheel.

Then:

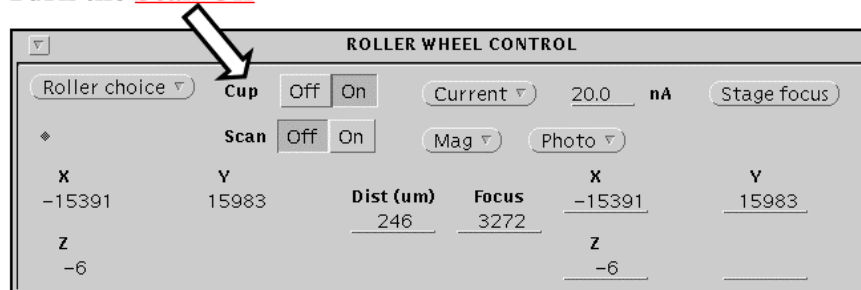
Turn the **Cup Off** and  
Turn the **Scan On**



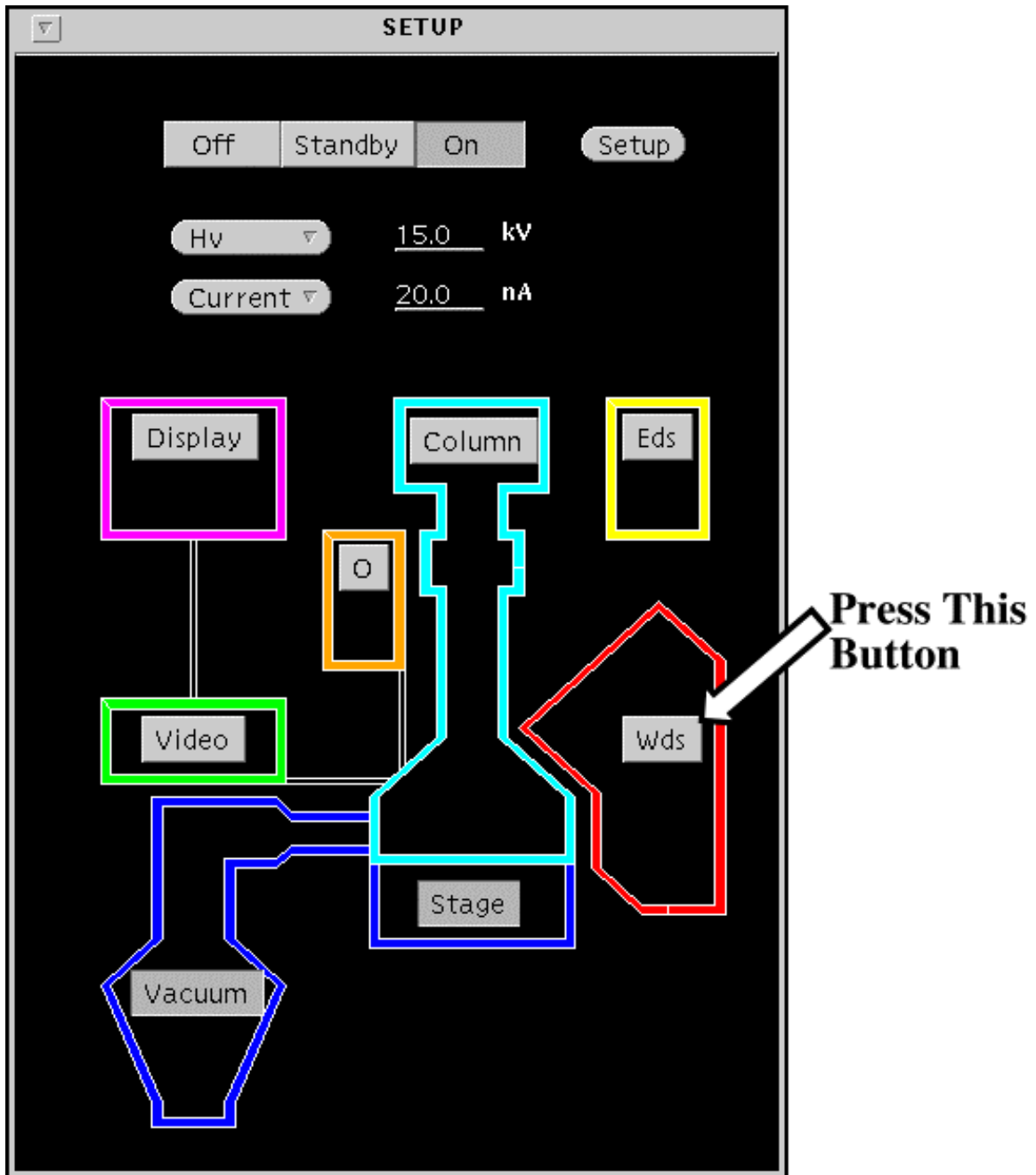
Find a clean spot using the secondary electron image

Then:

Turn the **Cup On** and  
Turn the **Scan Off**



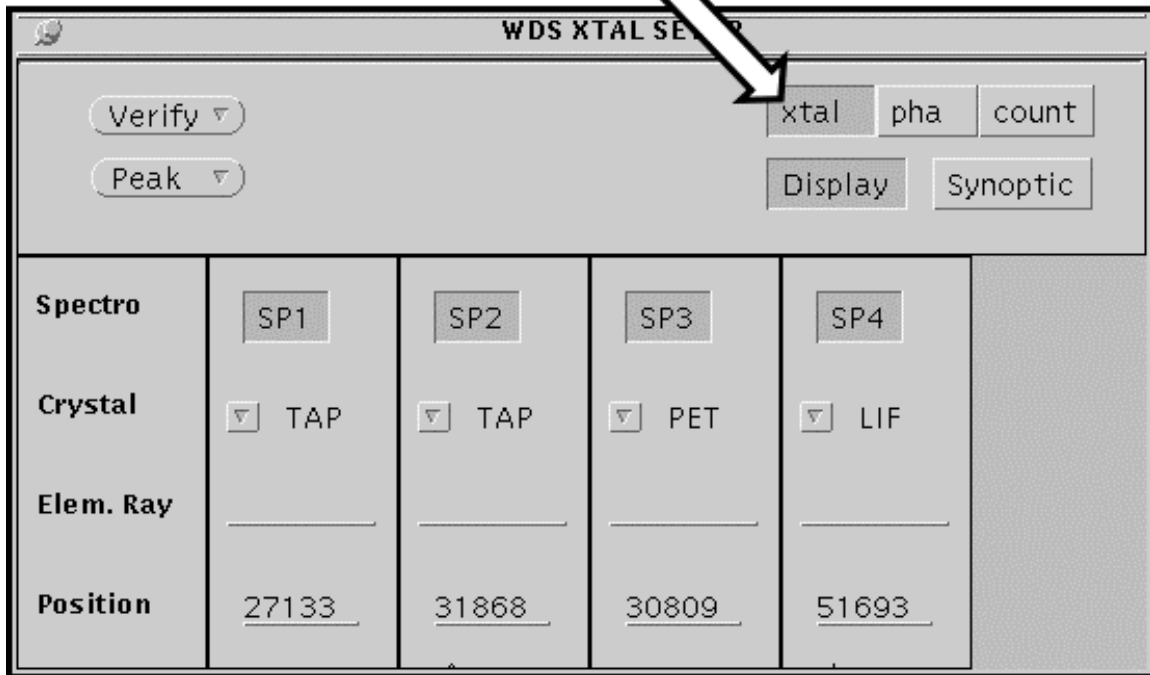
### Step 3





## Step 4

**Press This Button**



The screenshot shows a software interface titled "WDS XTAL SELECTION". At the top, there are two dropdown menus labeled "Verify" and "Peak". To the right of these are three buttons: "xtal", "pha", and "count". Below these are two more buttons: "Display" and "Synoptic". An arrow points from the text "Press This Button" to the "xtal" button. The main area of the interface is a table with four columns labeled "SP1", "SP2", "SP3", and "SP4". The rows are labeled "Spectro", "Crystal", "Elem. Ray", and "Position".

	SP1	SP2	SP3	SP4
<b>Spectro</b>	SP1	SP2	SP3	SP4
<b>Crystal</b>	▼ TAP	▼ TAP	▼ PET	▼ LIF
<b>Elem. Ray</b>	_____	_____	_____	_____
<b>Position</b>	27133_	31868_	30809_	51693_

## Step 5

**L-Click to turn on each spectrometer  
(SP button is dark when on)**

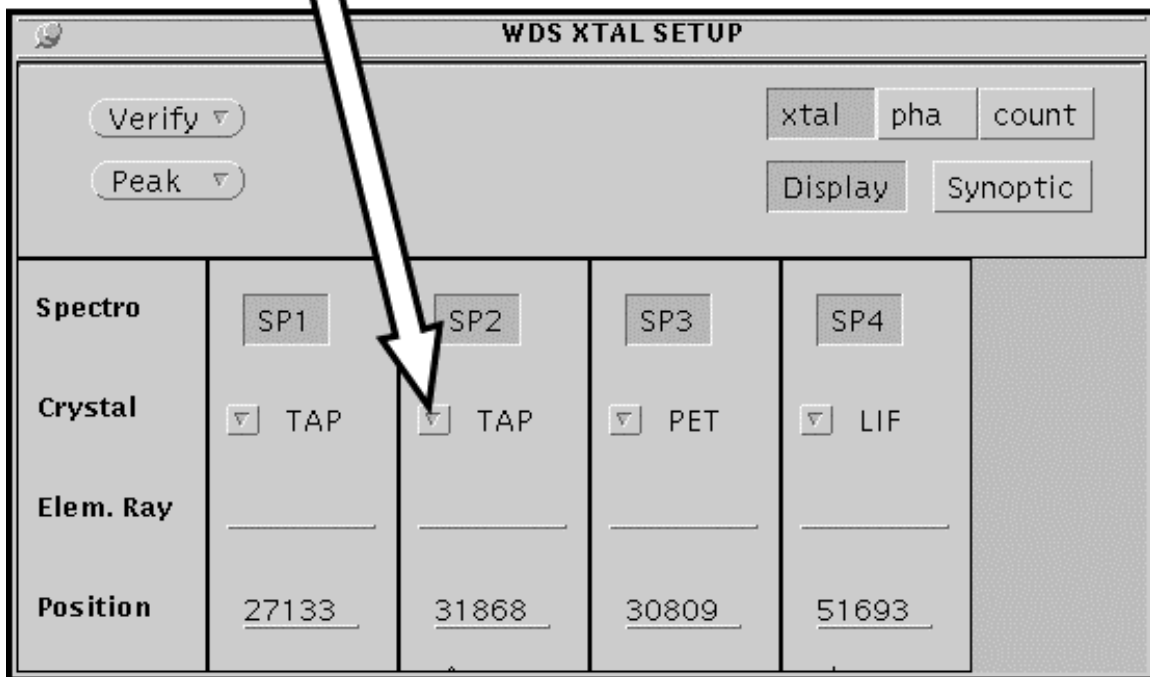
The screenshot shows the 'WDS LOCAL SETUP' window. At the top, there are buttons for 'Verify', 'Peak', 'al', 'pha', 'count', 'Display', and 'Synoptic'. Below this is a table with four columns representing spectrometers SP1, SP2, SP3, and SP4. Each column has a 'Spectro' row with a button labeled 'SP1' through 'SP4'. Below the 'Spectro' row is the 'Crystal' row with dropdown menus showing 'TAP', 'TAP', 'PET', and 'LIF'. The 'Elem. Ray' row has empty text boxes. The 'Position' row has text boxes containing '27133', '31868', '30809', and '51693'. Four white arrows point from the top of the page to each of the 'SP' buttons.

	SP1	SP2	SP3	SP4
<b>Spectro</b>	SP1	SP2	SP3	SP4
<b>Crystal</b>	TAP	TAP	PET	LIF
<b>Elem. Ray</b>				
<b>Position</b>	27133	31868	30809	51693

## Step 6

If you need to change a crystal on one (or more) spectrometers:

**R-Click on arrow and use RIGHT BUTTON to select new crystal from menu.**



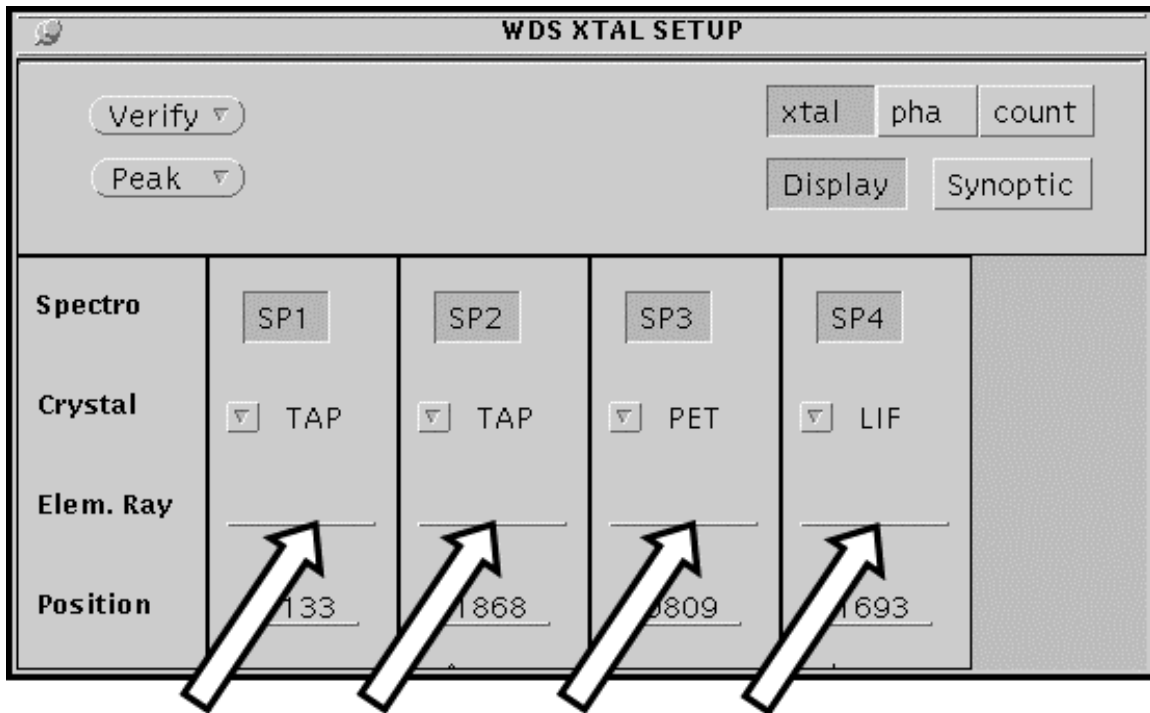
The screenshot shows a window titled "WDS XTAL SETUP" with a table of spectrometer configurations. The table has four columns for spectrometers SP1, SP2, SP3, and SP4. The rows are labeled "Spectro", "Crystal", "Elem. Ray", and "Position".

Spectro	SP1	SP2	SP3	SP4
Crystal	▼ TAP	▼ TAP	▼ PET	▼ LIF
Elem. Ray	_____	_____	_____	_____
Position	27133	31868	30809	51693

Additional controls in the window include "Verify" and "Peak" dropdown menus, and buttons for "xtal", "pha", "count", "Display", and "Synoptic".

**Repeat for any other spectrometers that need to have the crystal changed.**

## Step 7



**R-Click for each spectrometer and select the correct reference X-ray line from the periodic table.**

### Reference X-Ray Lines

TAP - Si Ka  
PET - Ca Ka  
LIF - Fe Ka  
PC1 - O Ka  
PC2 - O Ka  
PC3 - B Ka

## Step 8

**VERY IMPORTANT!**  
**R-CLICK** this button  
**(Do NOT L-CLICK)**

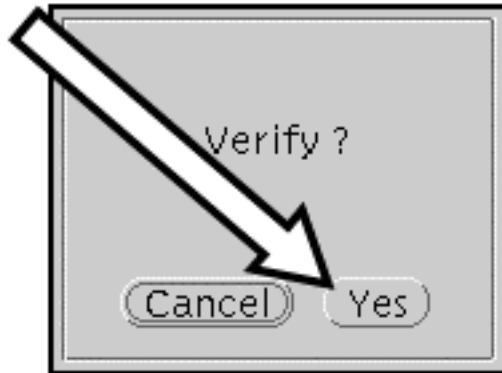
Then:

Select “On current Position”  
from the menu.

WDS XTAL SETUP				
	Verify ▾			xtal pha count
	Peak ▾			Display Synoptic
<b>Spectro</b>	SP1	SP2	SP3	SP4
<b>Crystal</b>	▾ TAP	▾ TAP	▾ PET	▾ LIF
<b>Elem. Ray</b>	Si Ka 1	Si Ka 1	Ca Ka 1	Fe Ka 1
<b>Position</b>	27737	27737	38387	48084

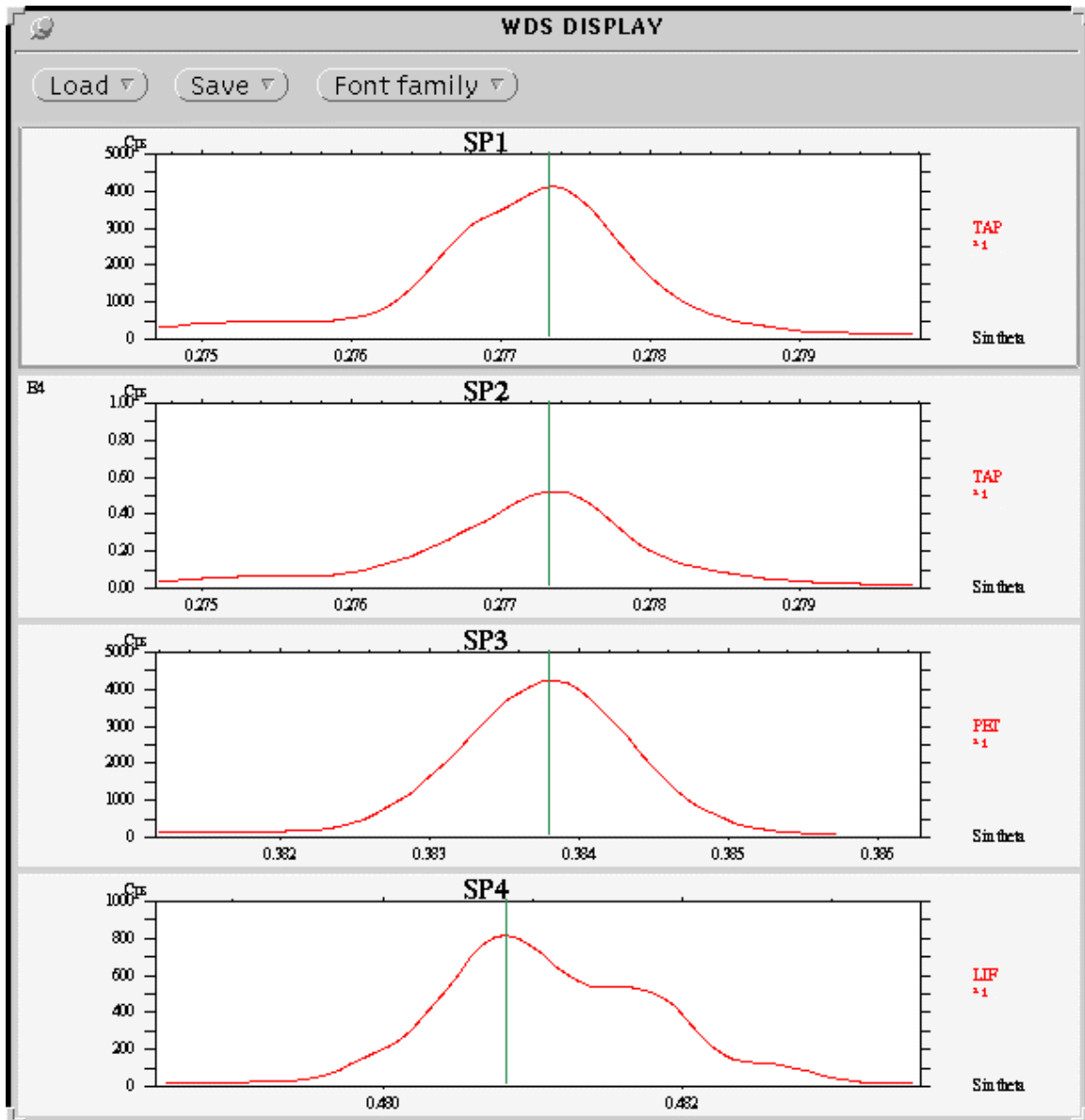
## Step 9

**Press This  
Button**



## Step 10

A peak search to locate the position of the reference X-ray lines will be performed.

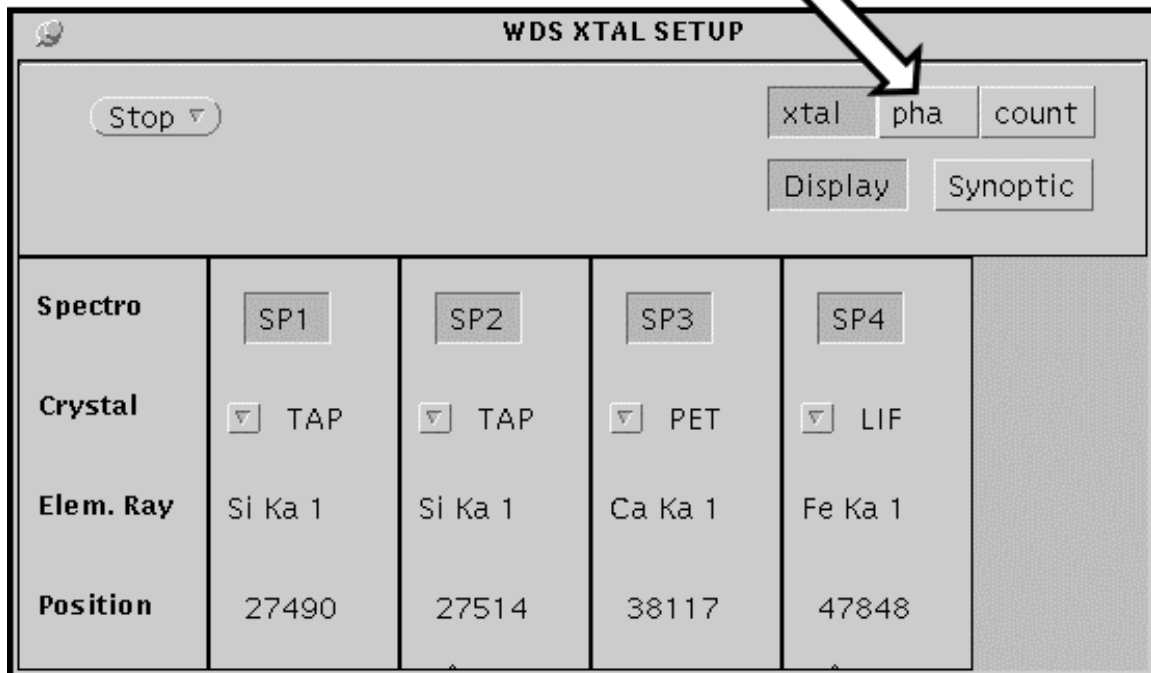


## Step 11

**When verification is done.**

**Then:**

**Press This Button**



The screenshot shows the 'WDS XTAL SETUP' window. At the top left is a 'Stop' button with a dropdown arrow. To the right are three buttons: 'xtal', 'pha', and 'count'. Below these are 'Display' and 'Synoptic' buttons. The main area is a table with four columns (SP1, SP2, SP3, SP4) and four rows (Spectro, Crystal, Elem. Ray, Position). An arrow points to the 'pha' button.

	SP1	SP2	SP3	SP4
<b>Spectro</b>	SP1	SP2	SP3	SP4
<b>Crystal</b>	▼ TAP	▼ TAP	▼ PET	▼ LIF
<b>Elem. Ray</b>	Si Ka 1	Si Ka 1	Ca Ka 1	Fe Ka 1
<b>Position</b>	27490	27514	38117	47848



## Step 12

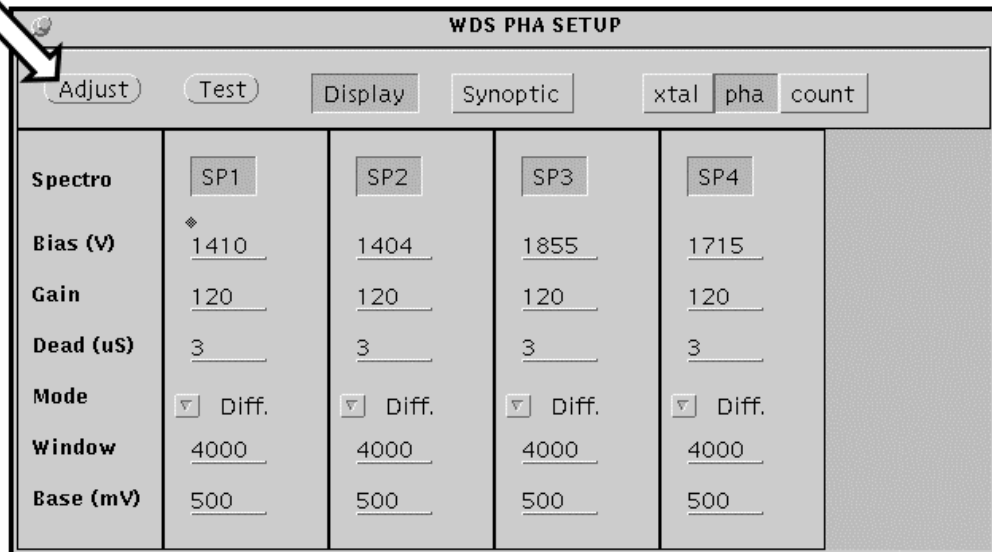
**Make sure these settings are correct (see below)**

	SP1	SP2	SP3	SP4
<b>Spectro</b>	SP1	SP2	SP3	SP4
<b>Bias (V)</b>	1410	1404	1855	1715
<b>Gain</b>	120	120	120	120
<b>Dead (uS)</b>	3	3	3	3
<b>Mode</b>	Diff.	Diff.	Diff.	Diff.
<b>Window</b>	4000	4000	4000	4000
<b>Base (mV)</b>	500	500	500	500

## Step 13

Then:

Press This  
Button

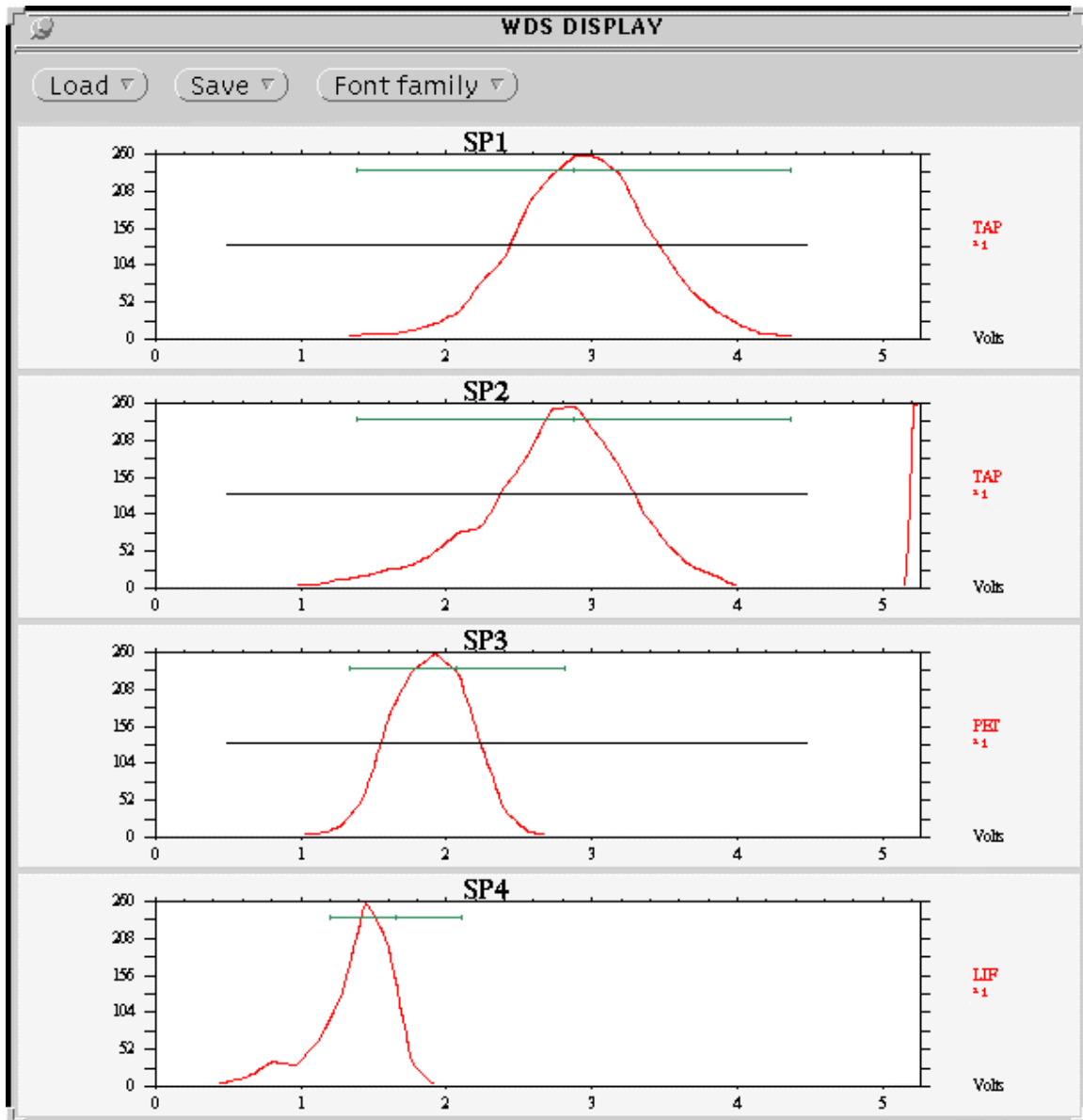


The screenshot shows the 'WDS PHA SETUP' window. At the top, there are four buttons: 'Adjust', 'Test', 'Display', and 'Synoptic'. To the right of these buttons are three tabs: 'xtal', 'pha', and 'count'. Below the buttons is a table with columns for 'SP1', 'SP2', 'SP3', and 'SP4'. The rows represent different parameters: 'Spectro', 'Bias (V)', 'Gain', 'Dead (uS)', 'Mode', 'Window', and 'Base (mV)'. Each cell in the table contains a numerical value or a dropdown menu.

	SP1	SP2	SP3	SP4
Spectro	SP1	SP2	SP3	SP4
Bias (V)	1410	1404	1855	1715
Gain	120	120	120	120
Dead (uS)	3	3	3	3
Mode	Diff.	Diff.	Diff.	Diff.
Window	4000	4000	4000	4000
Base (mV)	500	500	500	500

## Step 14

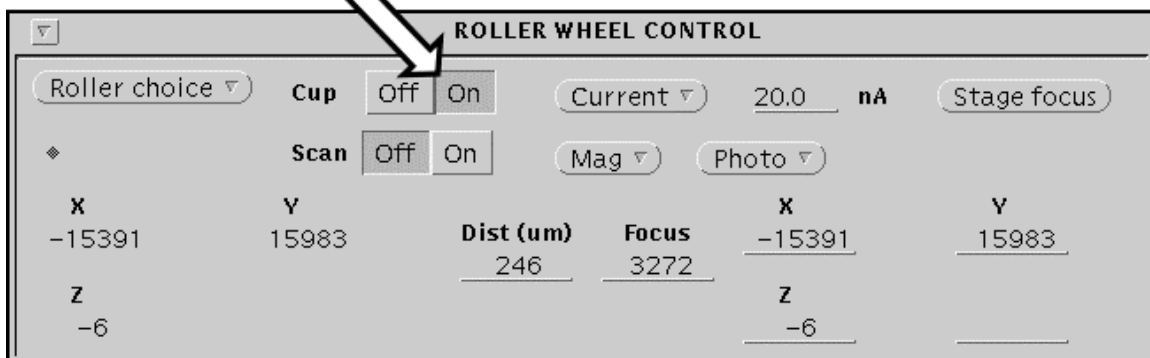
The detector voltage and PHA settings will be set.



## Step 15

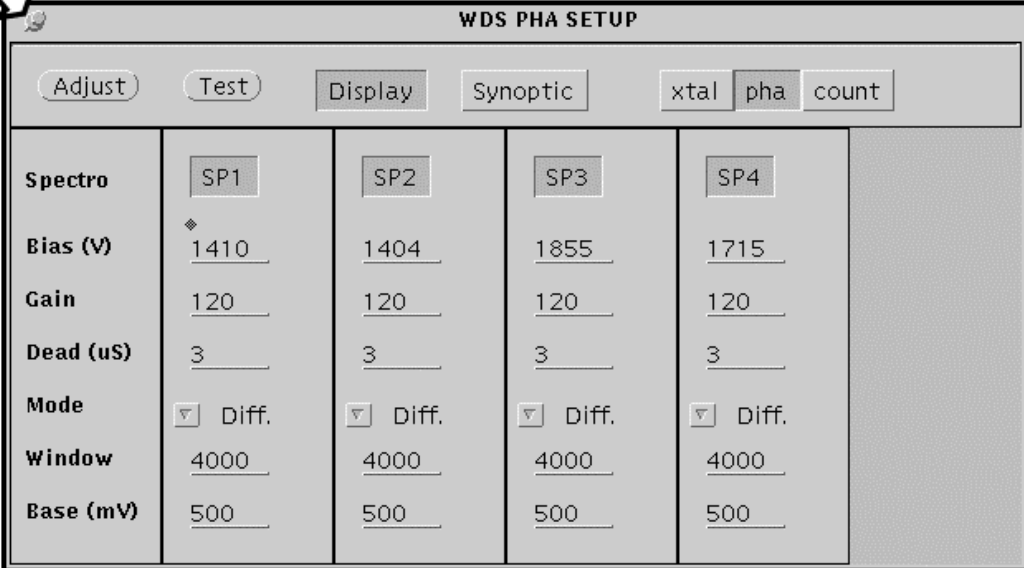
When the PHA settings are complete. **Turn the cup on.**

**Turn the Cup - ON.**



## Step 16

Click this pin  
to close window



The screenshot shows a software window titled "WDS PHA SETUP". At the top left of the window is a small circular icon with a pin, which is highlighted by a white arrow pointing from the text "Click this pin to close window". The window contains several tabs: "Adjust", "Test", "Display", "Synoptic", "xtal", "pha", and "count". The "pha" tab is currently selected. Below the tabs is a table with four columns labeled "SP1", "SP2", "SP3", and "SP4". The rows in the table represent different parameters: "Spectro", "Bias (V)", "Gain", "Dead (uS)", "Mode", "Window", and "Base (mV)". Each parameter has a corresponding value for each of the four spectrometers.

Spectro	SP1	SP2	SP3	SP4
Bias (V)	1410	1404	1855	1715
Gain	120	120	120	120
Dead (uS)	3	3	3	3
Mode	Diff.	Diff.	Diff.	Diff.
Window	4000	4000	4000	4000
Base (mV)	500	500	500	500

**Startup Procedure Completed**

# **Next Step**

**Go to Calibration  
Instruction Set**