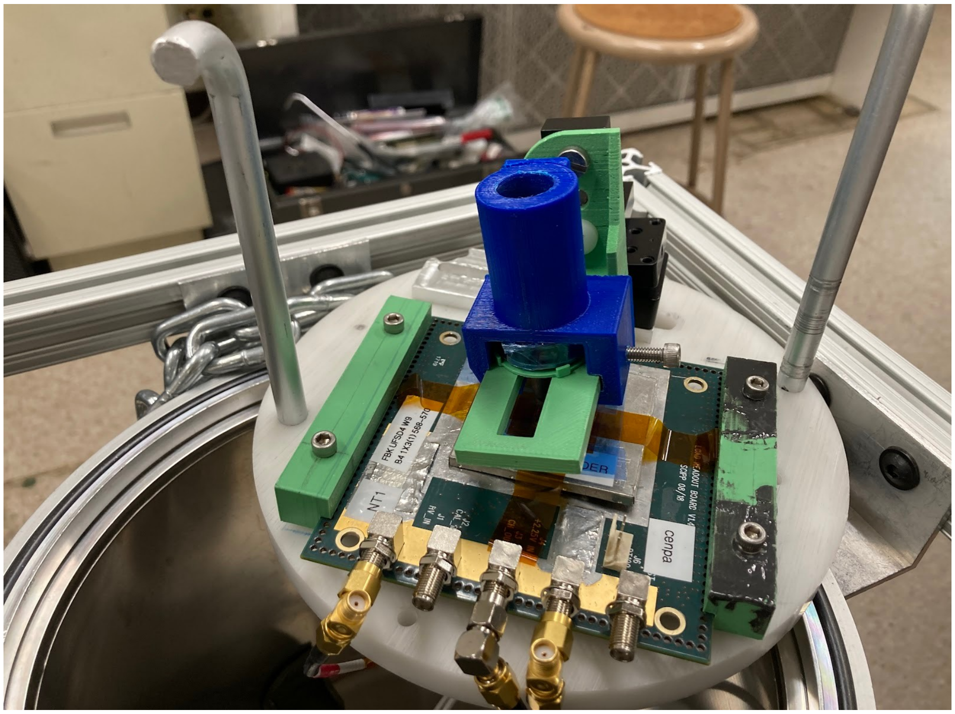
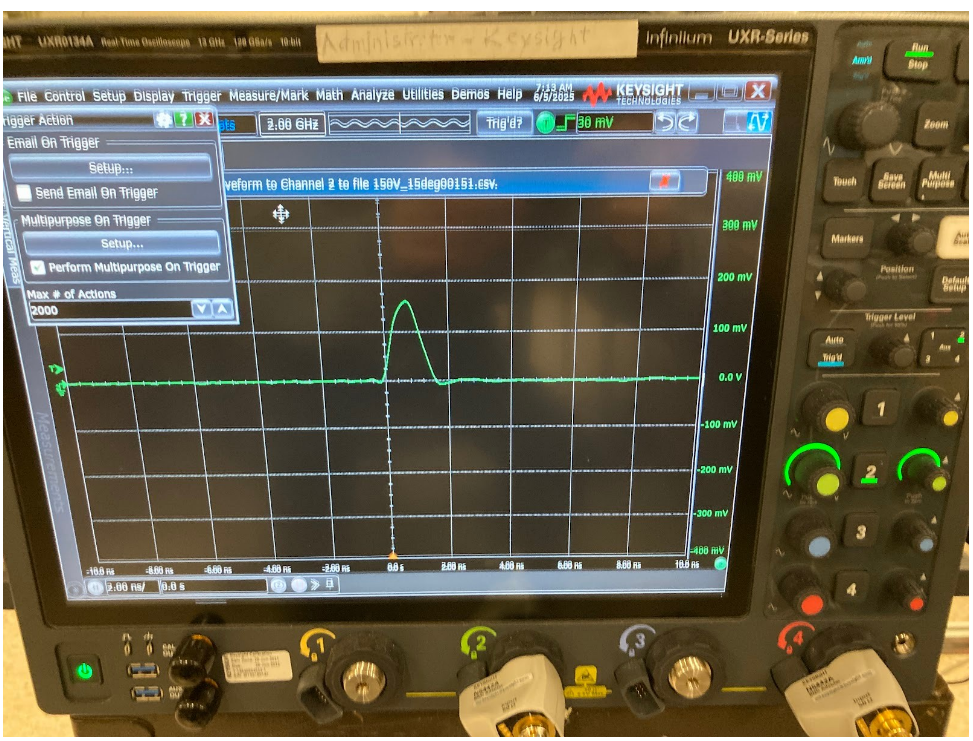
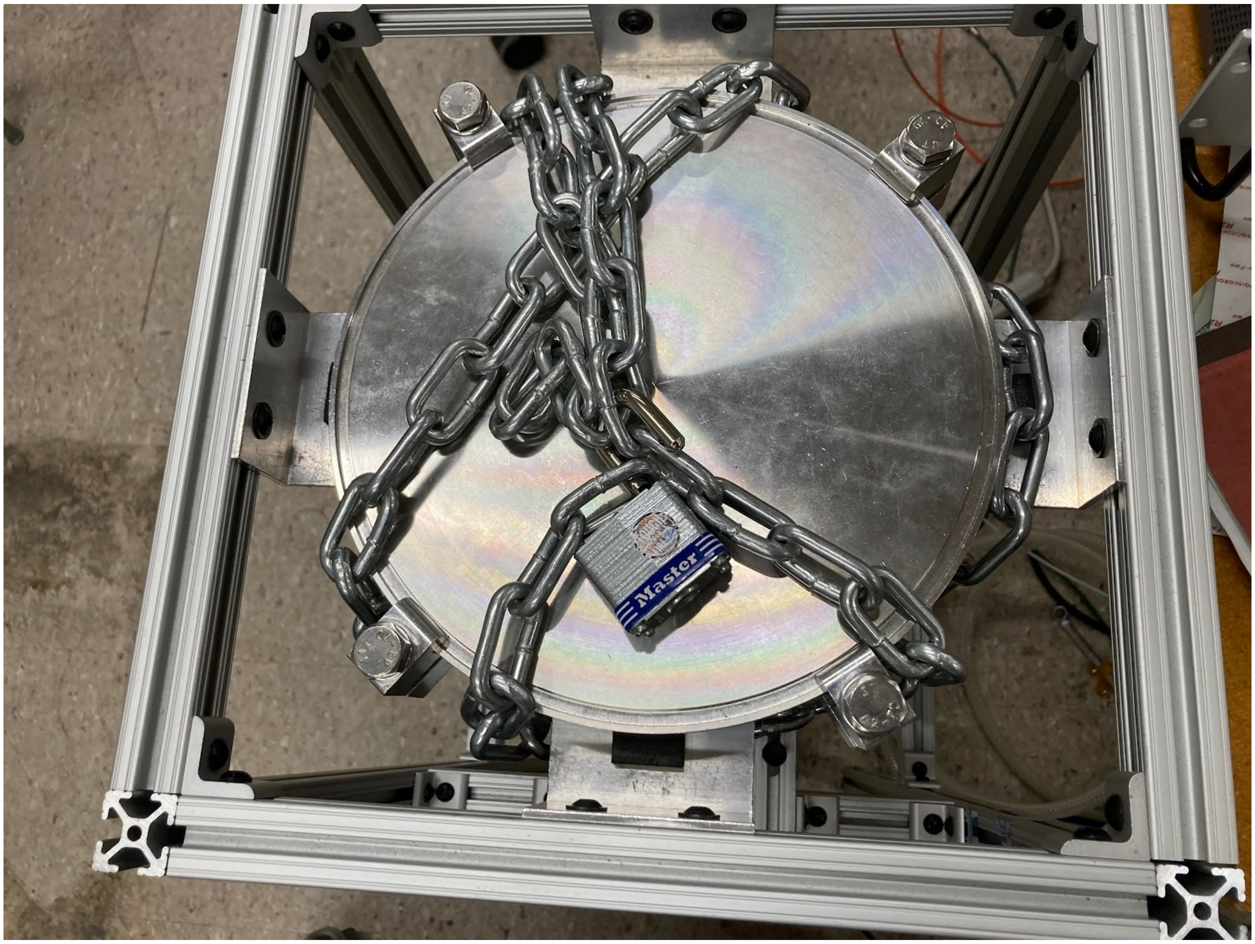
Alpha Station Data Taking Process

This is what the proper setup looks like and the expected result on the oscilloscope if the data taking process is done correctly.

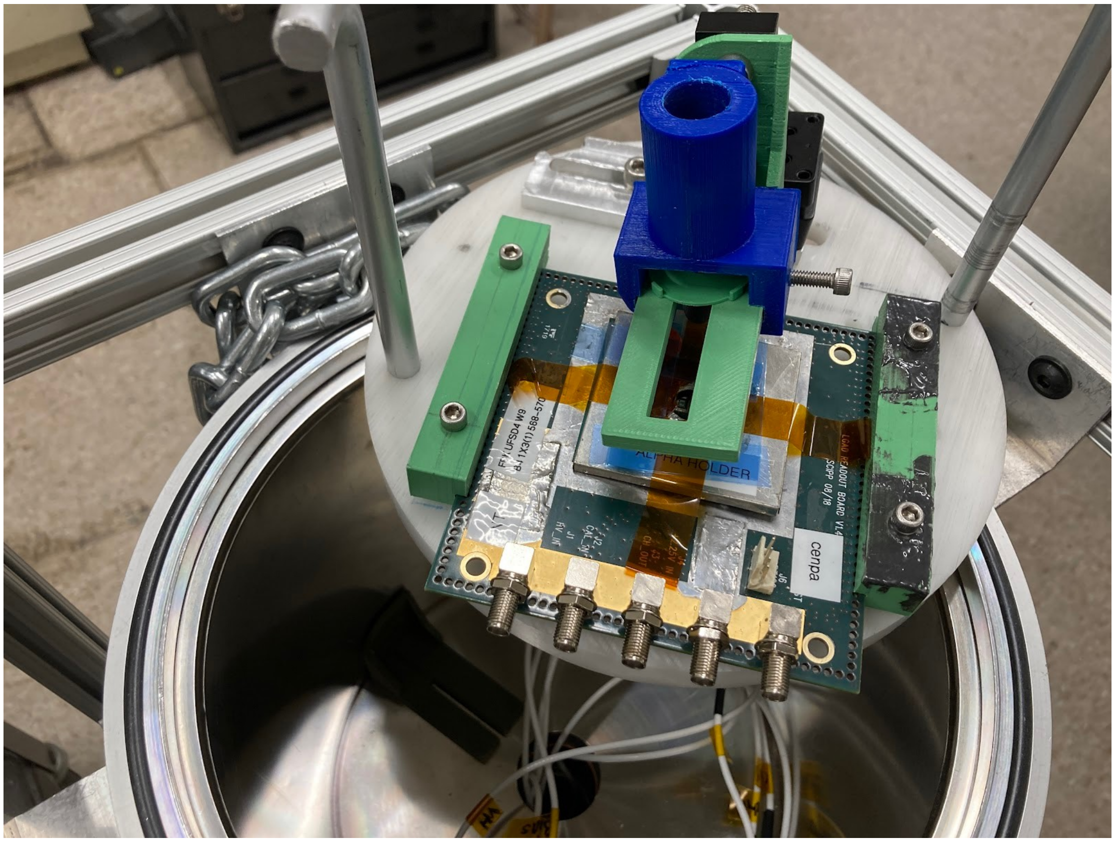


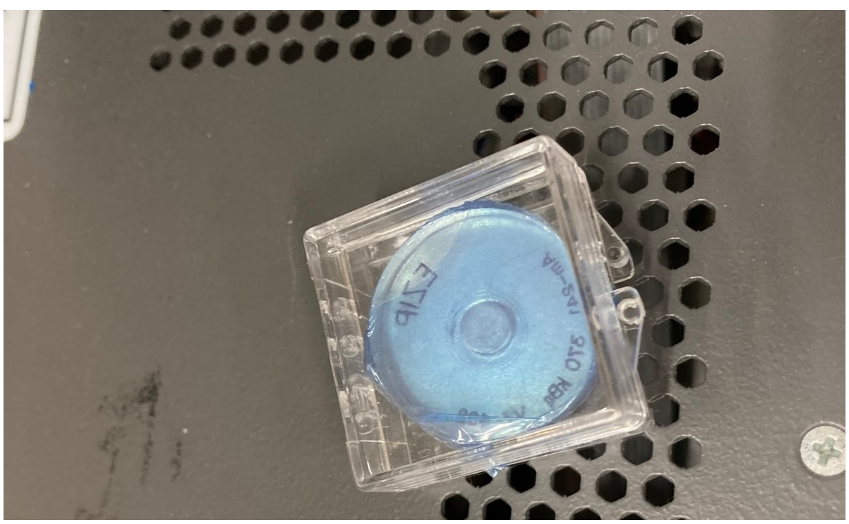


If you are ever leaving the chamber unattended for a significant amount of time, you must lock the chamber with the chains. Make sure that you try to remove the chains with the lock attached before fully closing the lock.

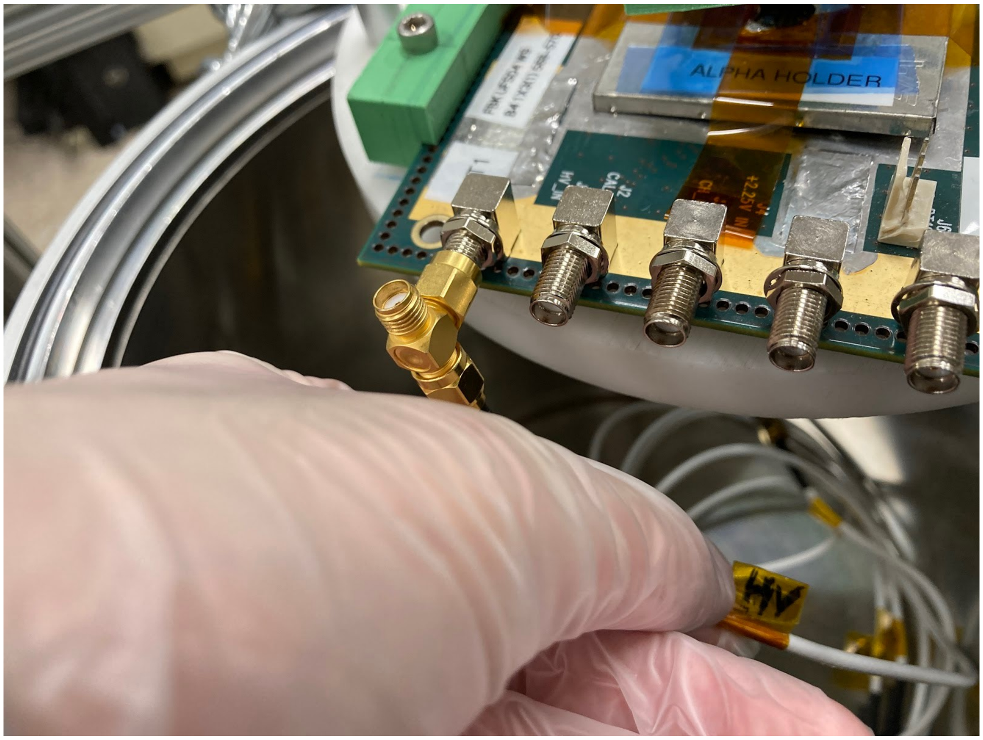


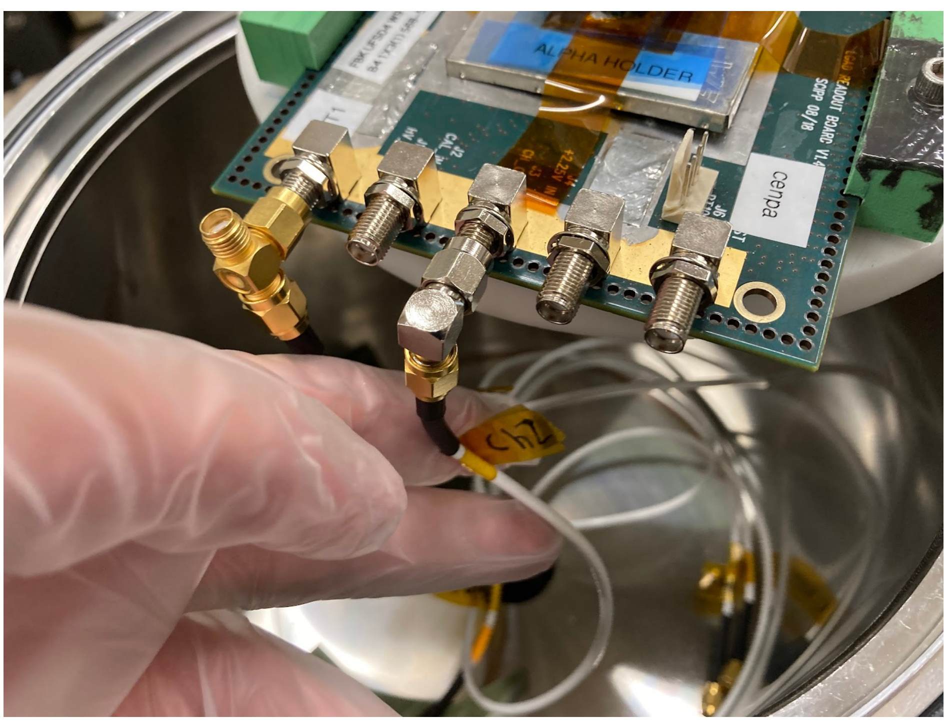
Step 1: Put some gloves on, open the chamber, lift the platform up, and place a board in the green slots. Make sure to put the alpha source in the plastic box.

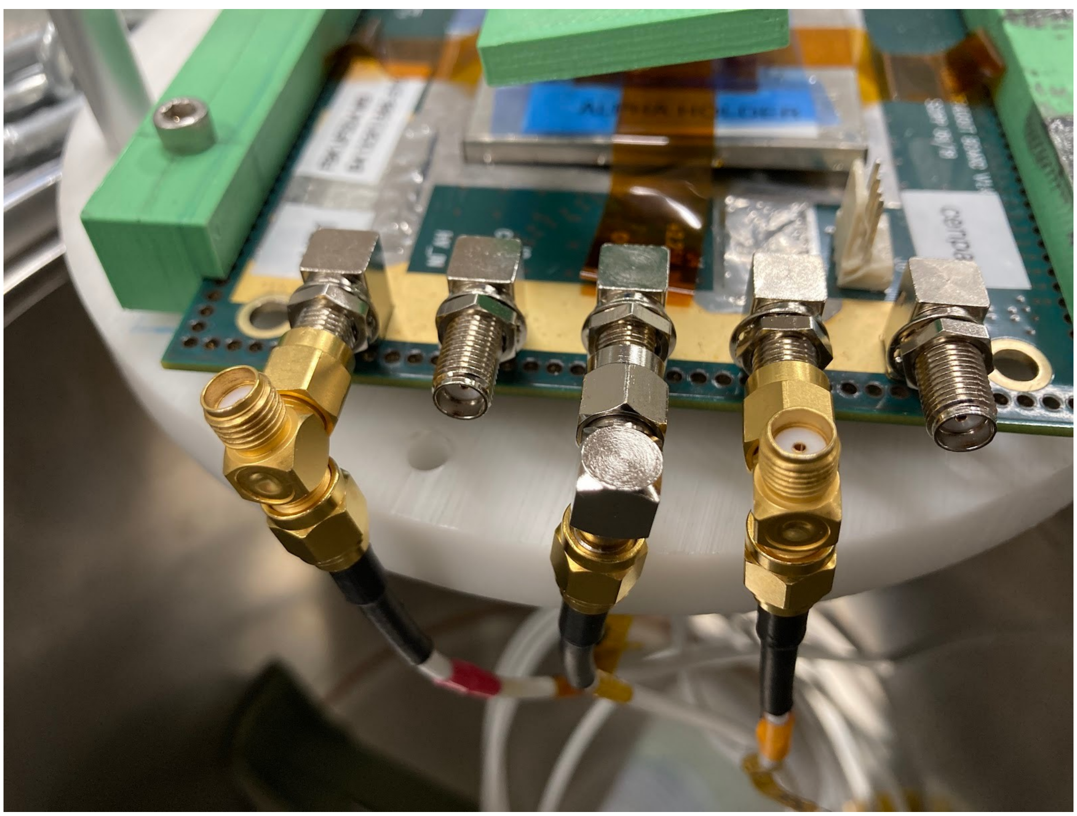




Step 2: Connect the HV (left, HV_IN), channel output (middle, CH_OUT), and bias (middle right, +2.25V IN) cables to the board (recommended order). Then push the board such that the cables are flush against the platform.



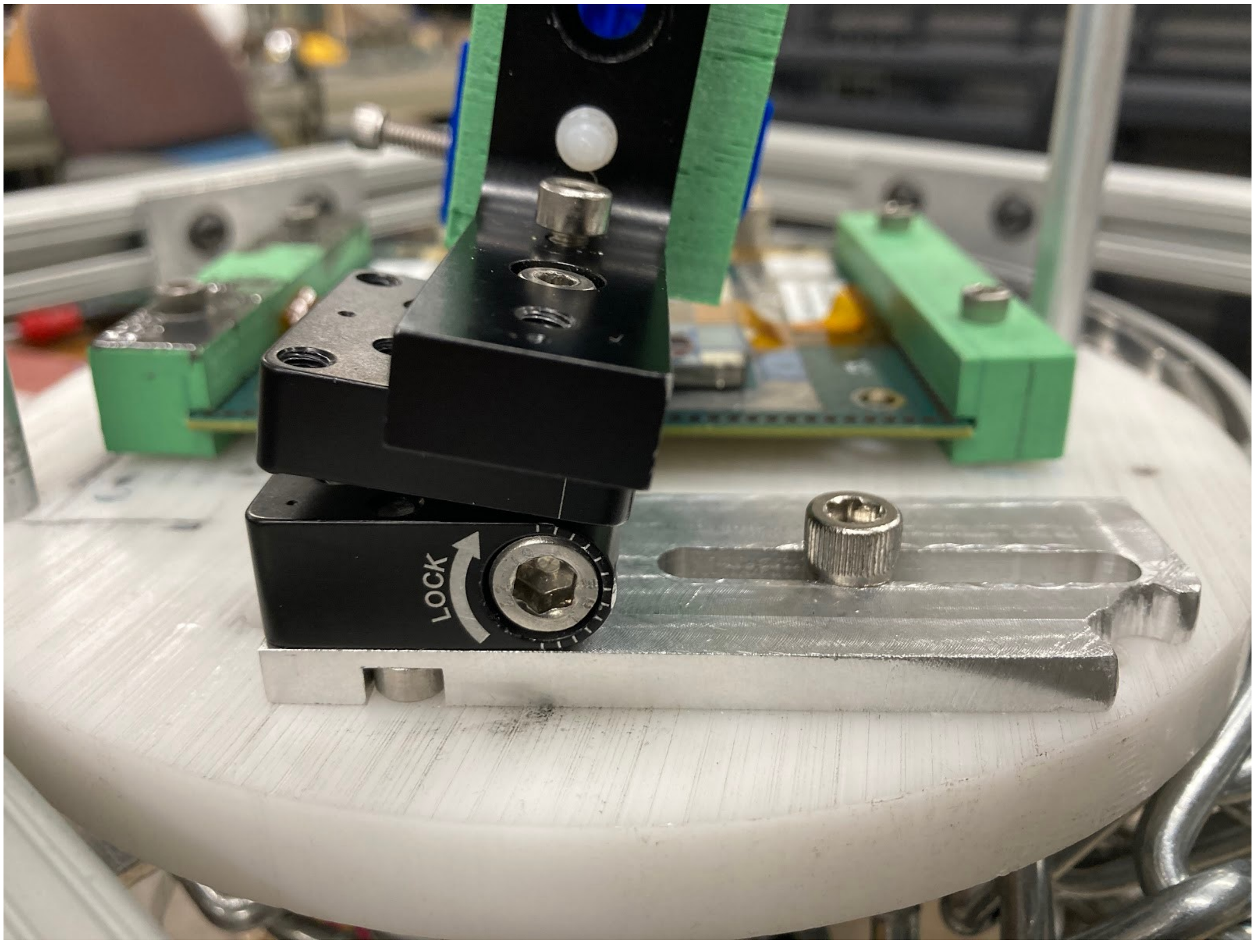




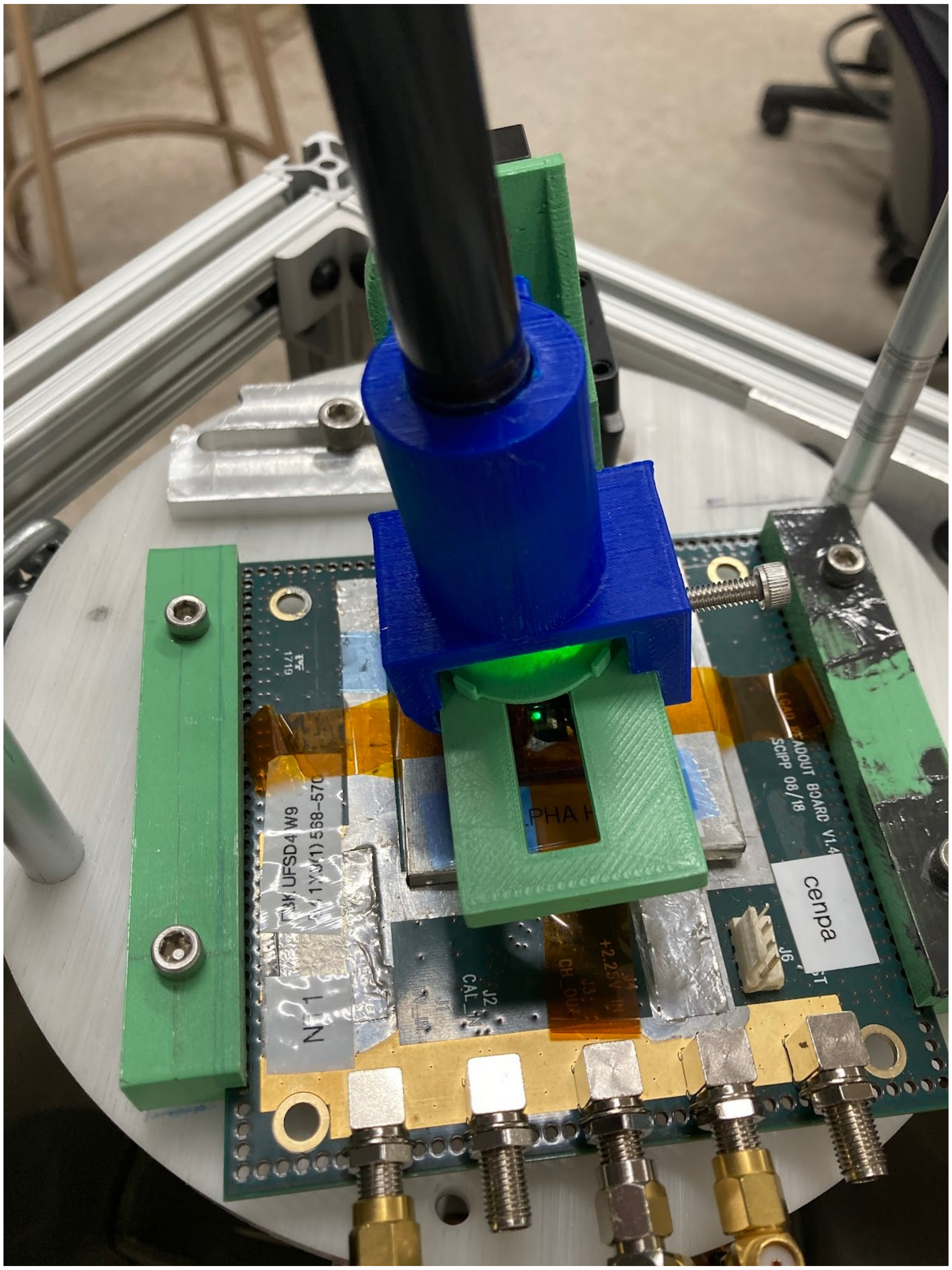
Make sure the cables are vertical and the connections are finger tight.

Step 3: Change the angle as desired, note that every tick mark corresponds to 15 degrees.

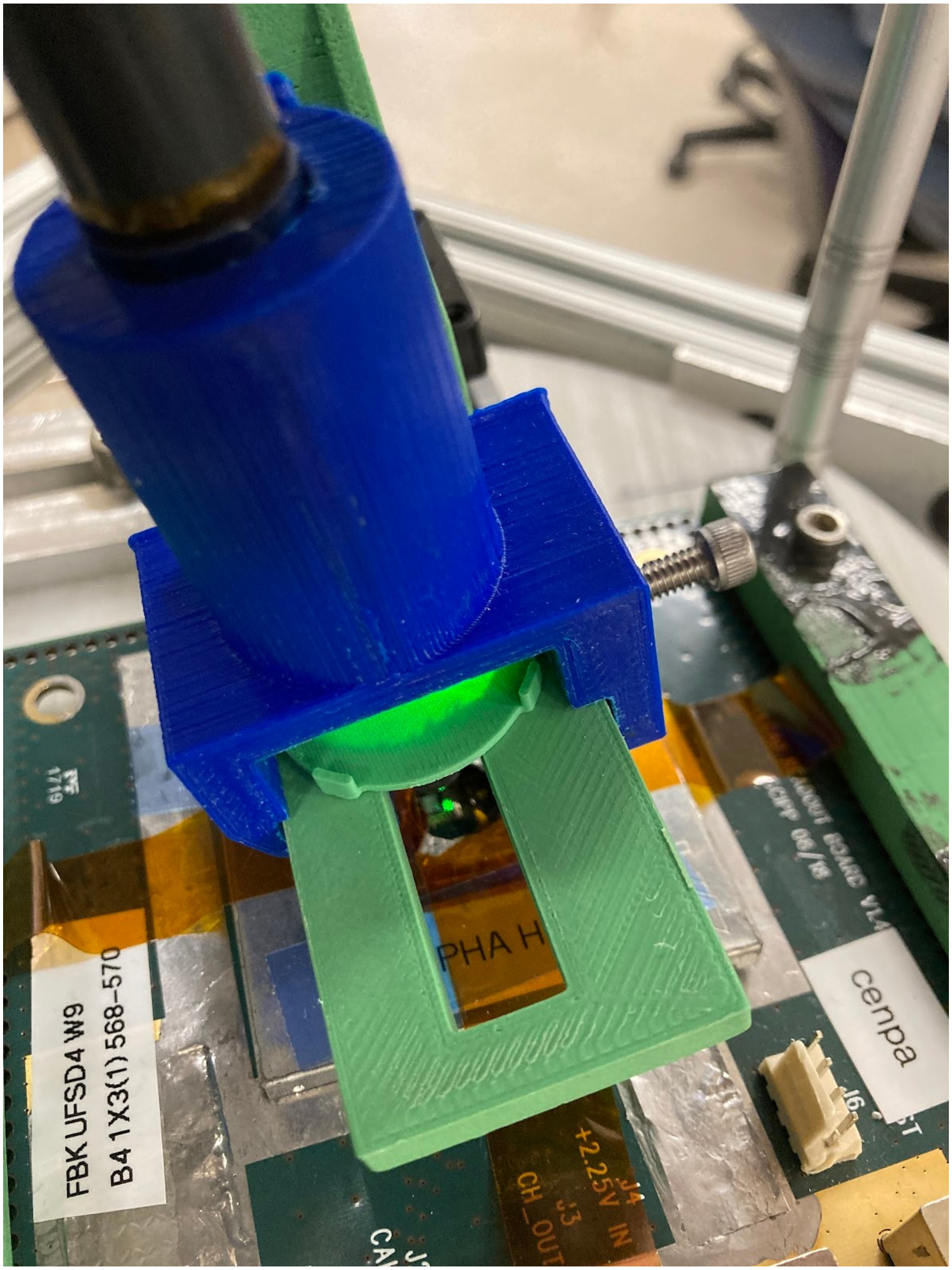
In the photo, it is set to the first tick mark, therefore it is at an angle of 15 degrees.



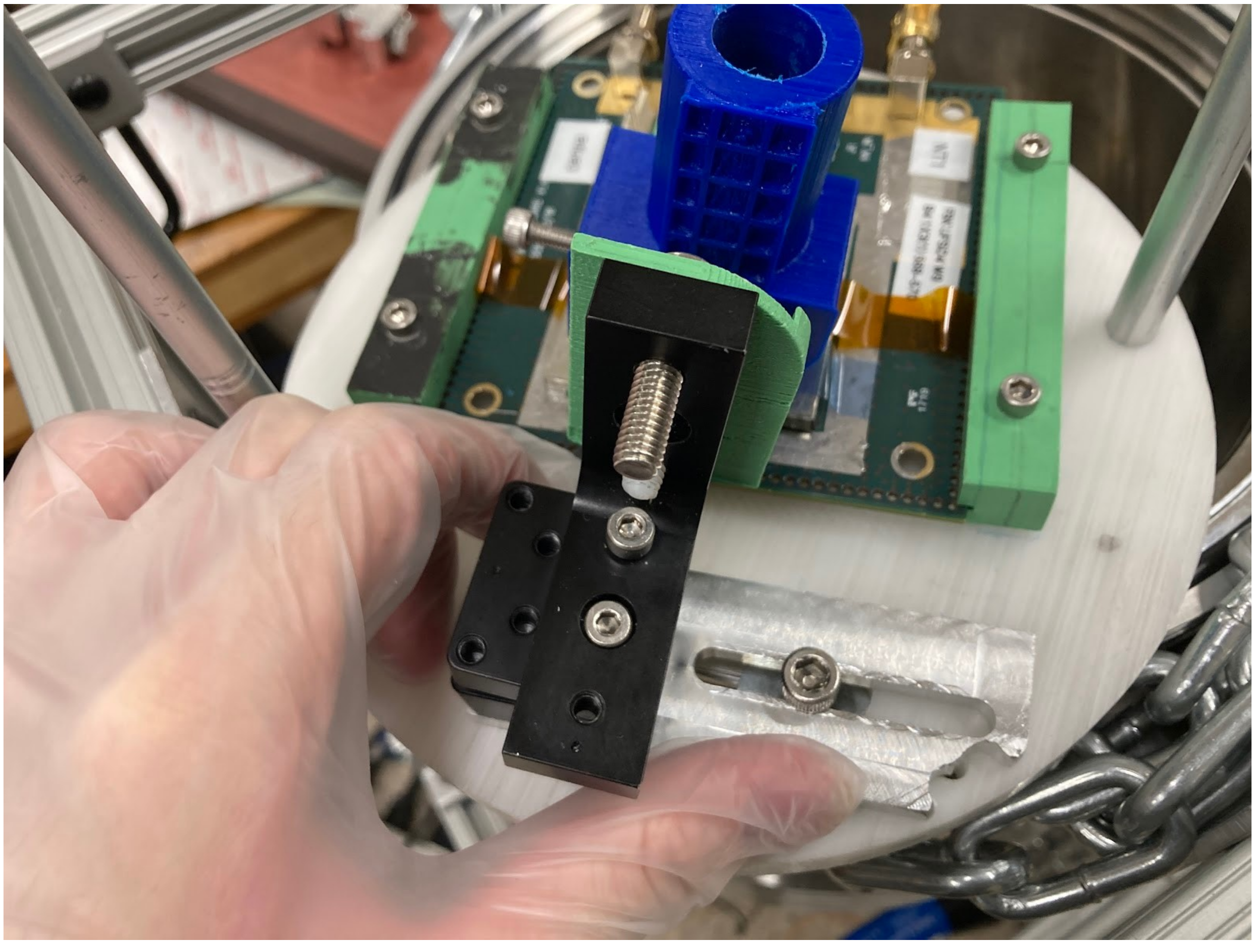
Step 4: Use a laser to align the collimator to the sensor and tighten it using the screw on the side of the blue housing.



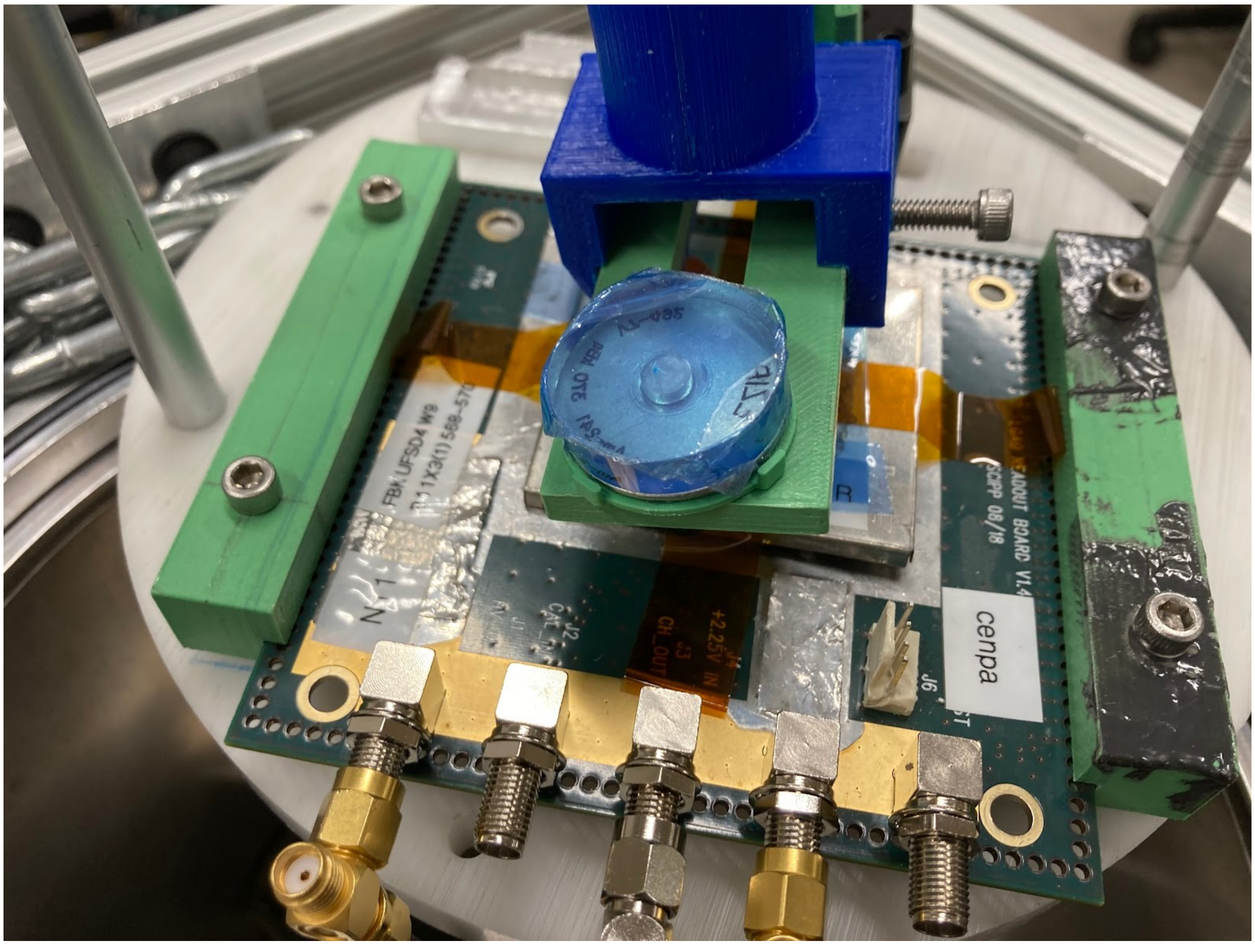
Note: You may encounter a situation where the collimator is misaligned perpendicular to the direction of the translational movement of the 3D printed housing such as below.

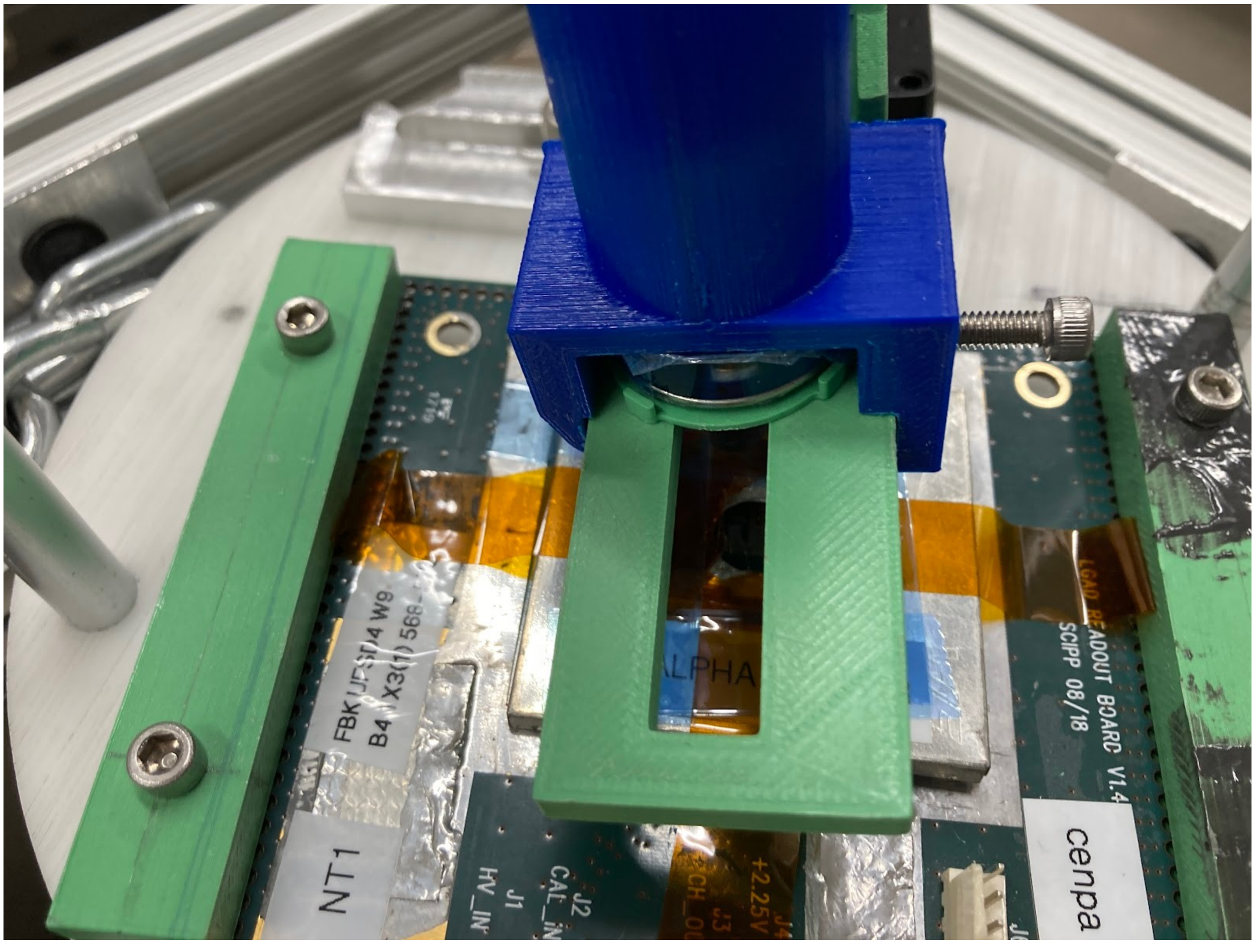


In this case, you can combine pushing the metal base of the rotational stage and moving the 3D printed housing to align it properly.

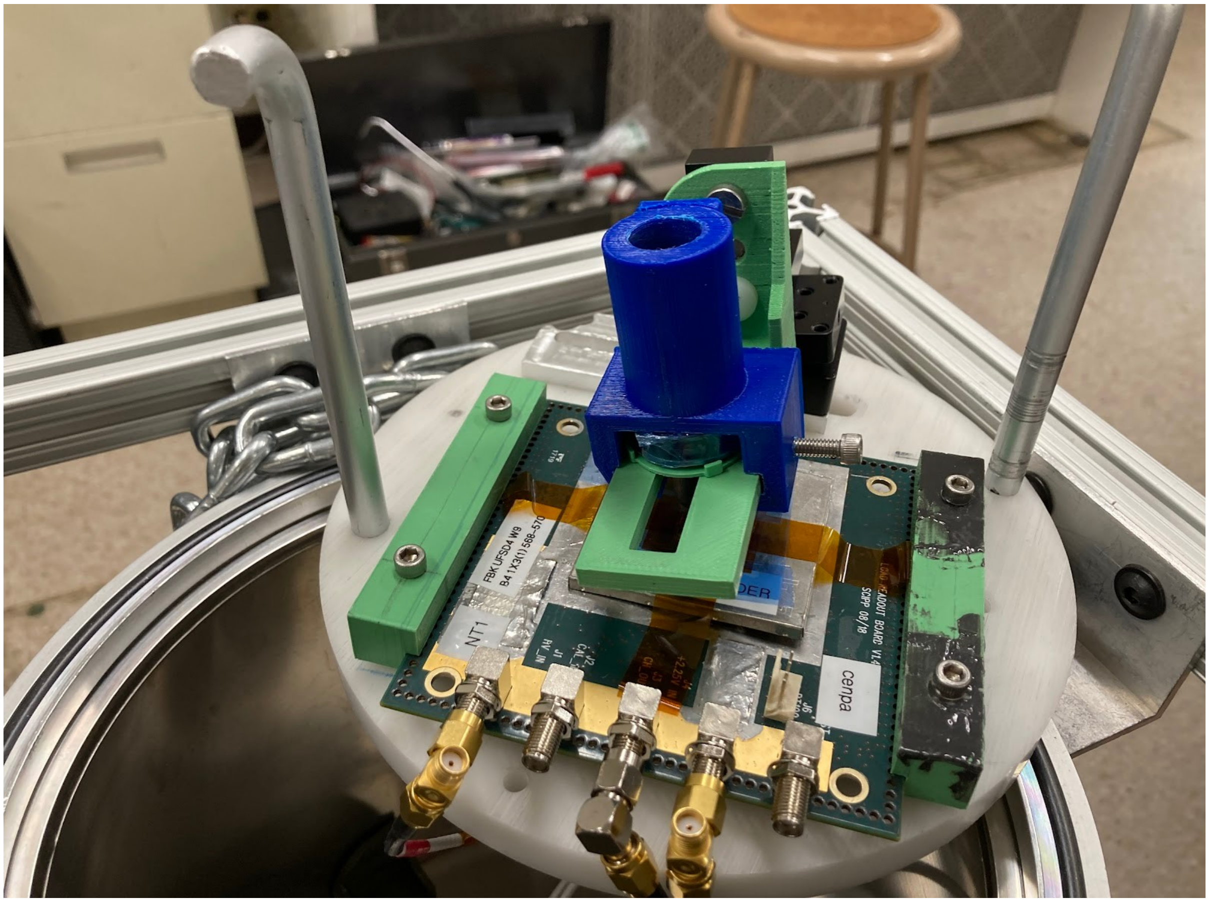


Step 5: Take the alpha source out of the plastic housing and put it on top of the collimator. Then push it inside the housing while holding the housing to ensure it does not mess up the alignment and further tighten it with the screw.

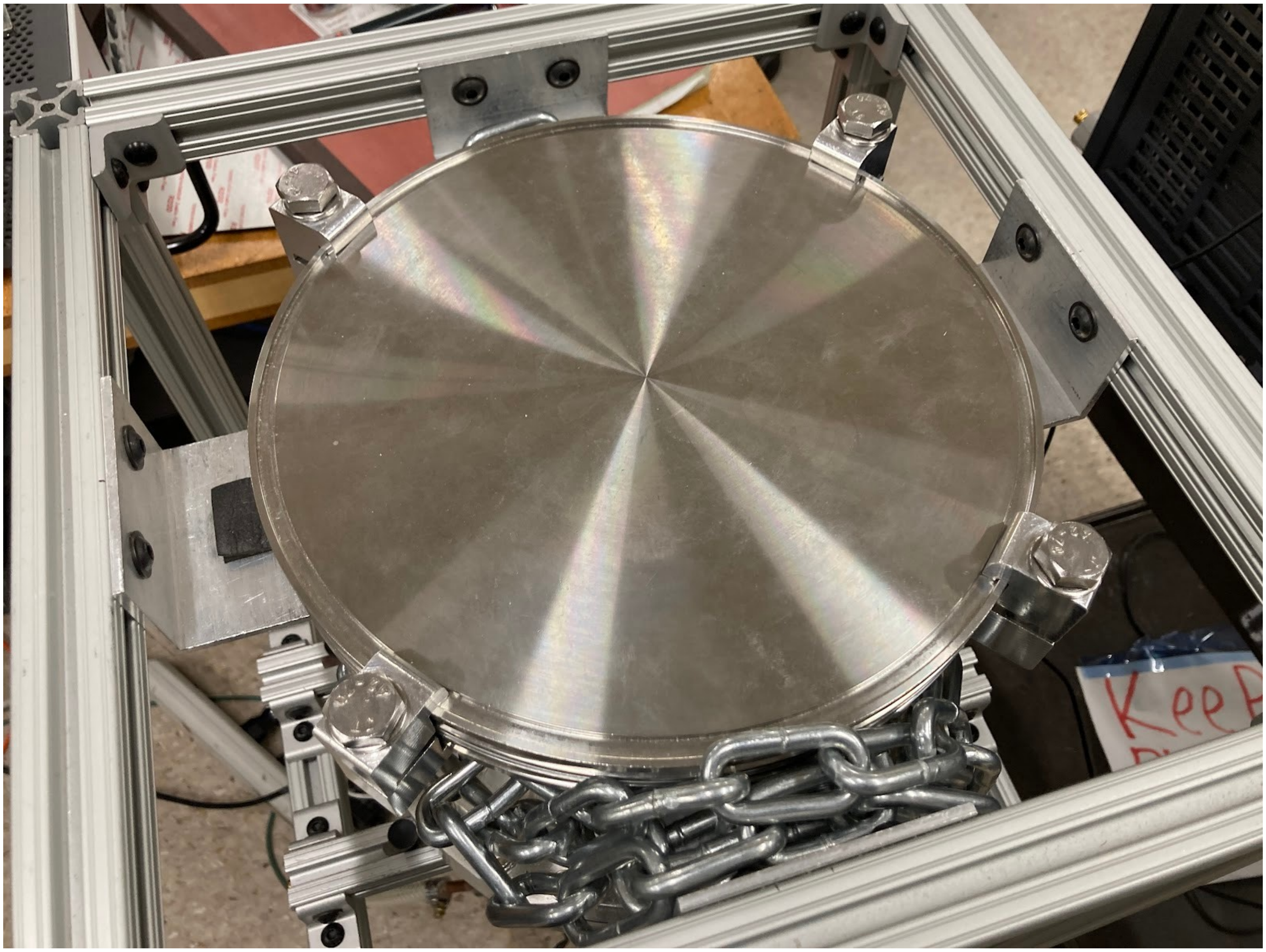



ALPHA
NT1
cenpa
SCIPP 08/18
+2.25V

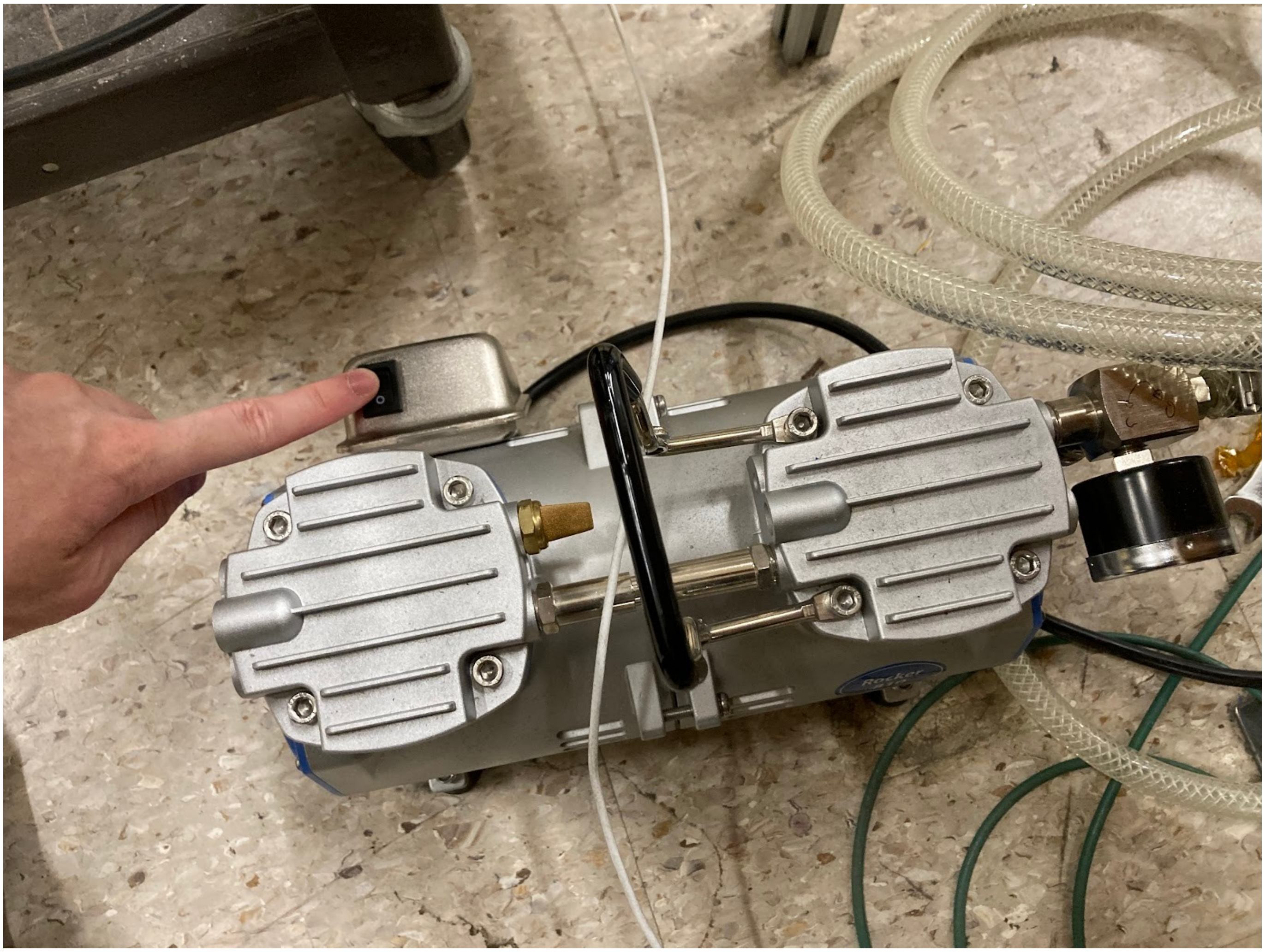
This is how it should look if it is set up correctly.

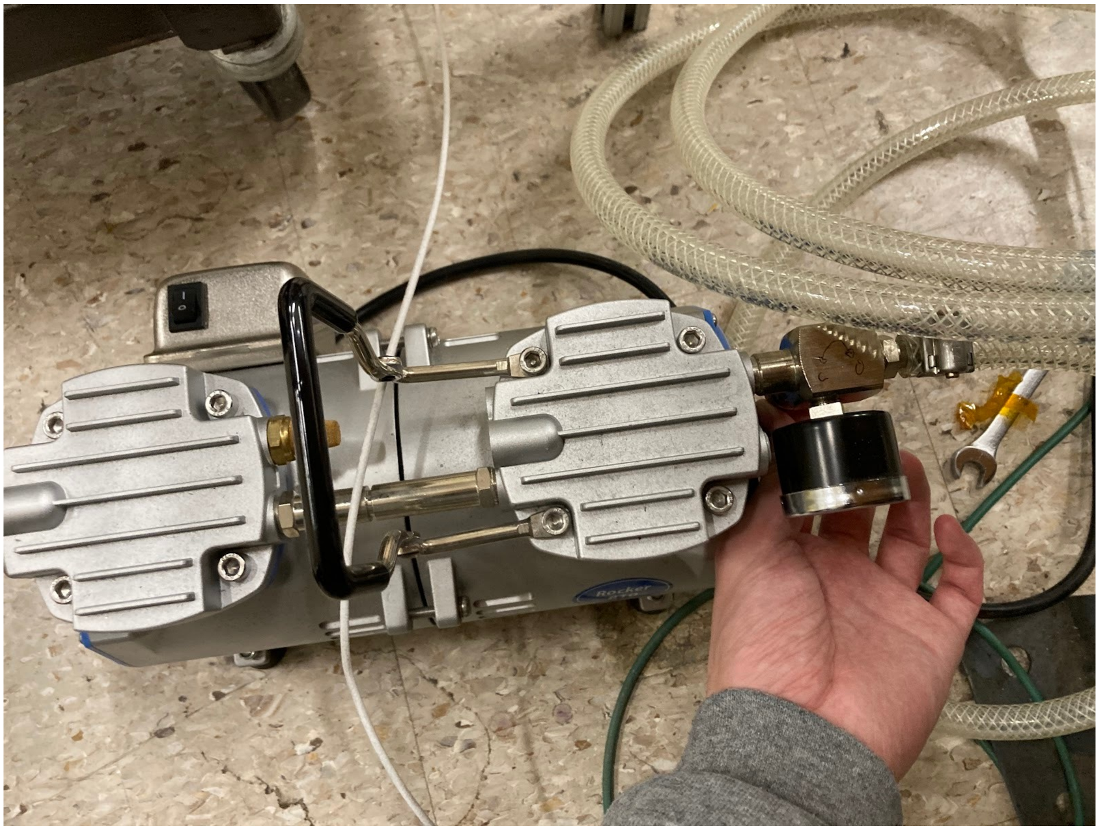


Step 6: Lower the platform into the chamber, put the lid back on the chamber, and clamp it down.



Step 7: Once the lid is clamped on, turn on the vacuum and close/open the valve until the pressure reaches about 80 Torr.

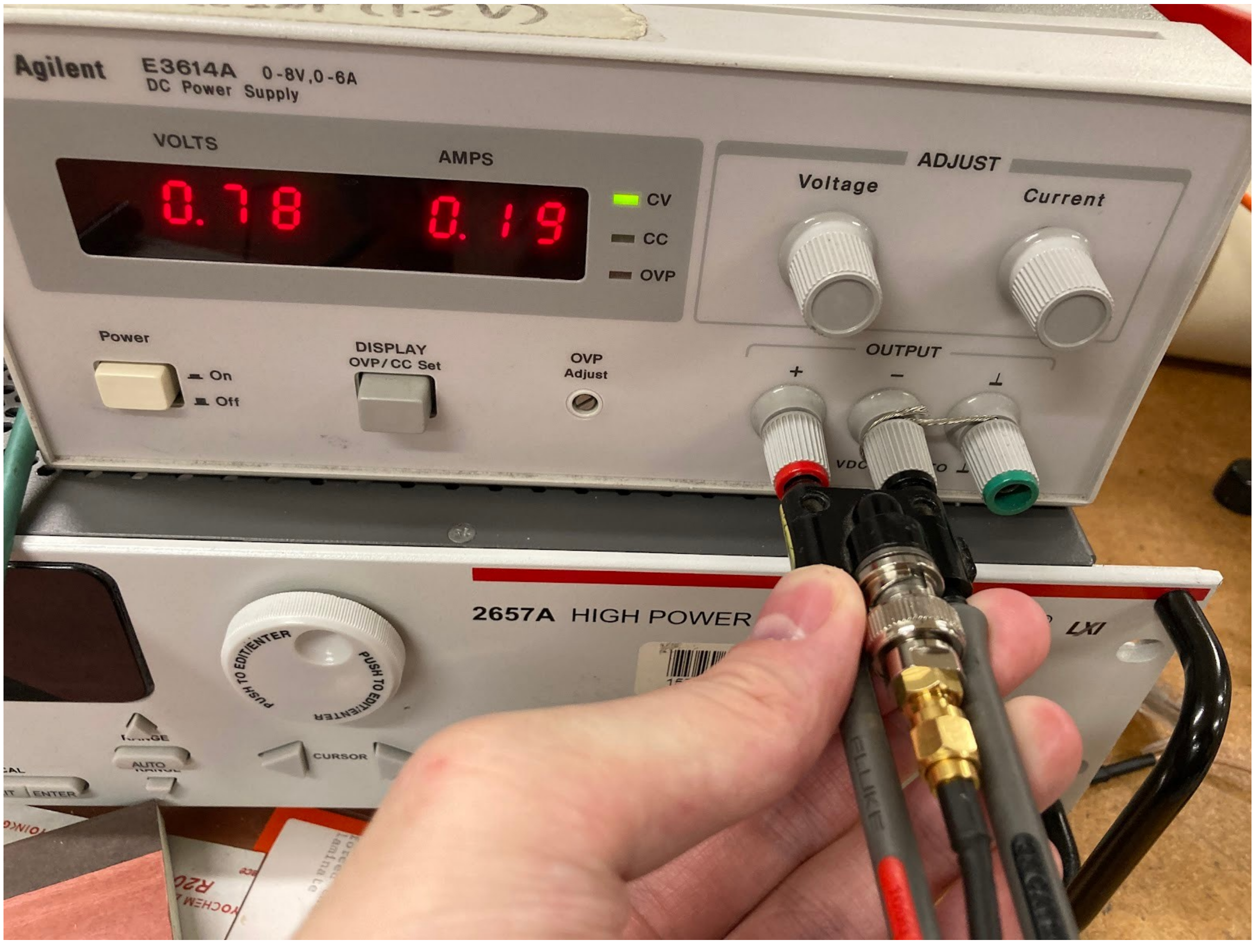





77.9

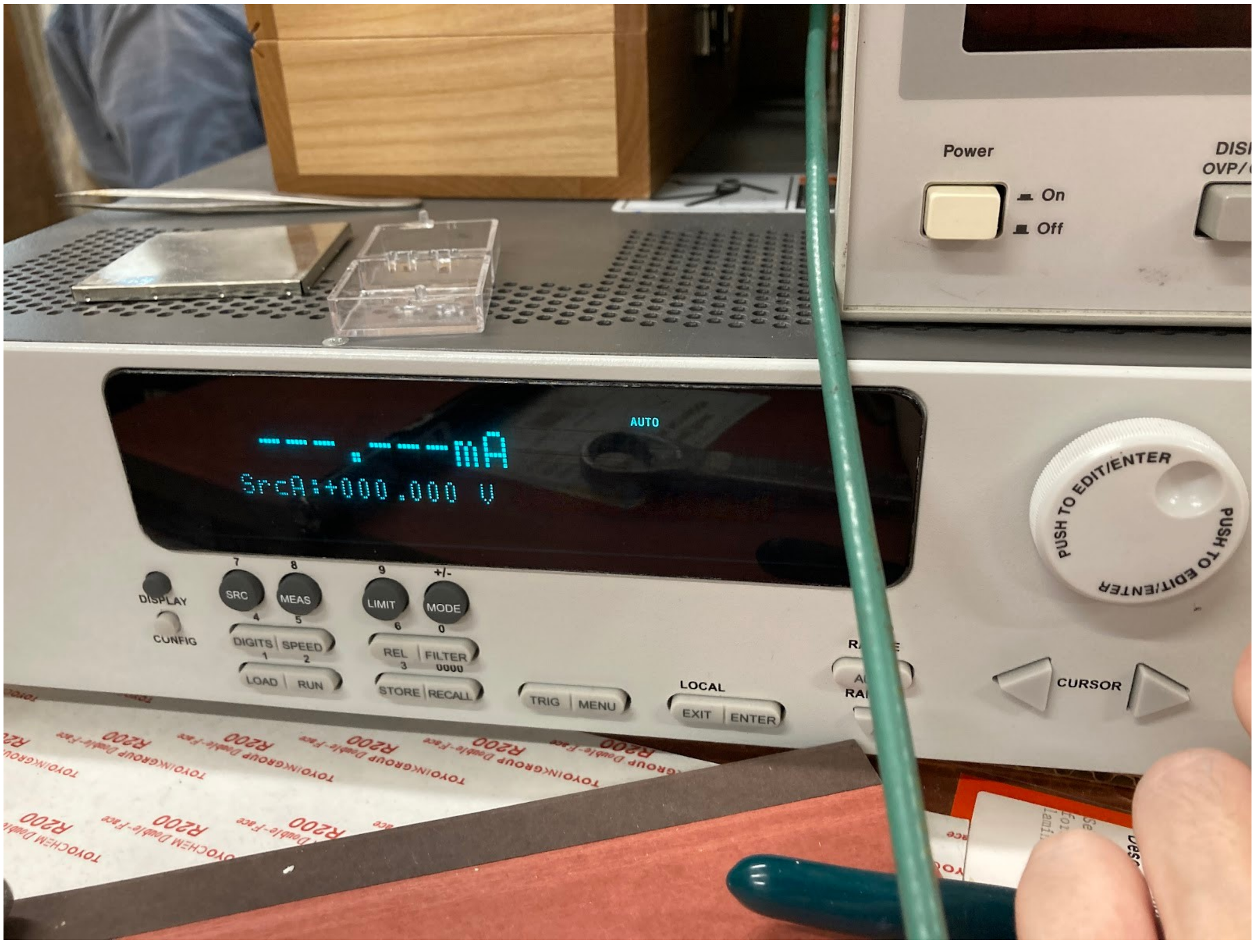
Step 8: Turn on the low voltage power supply and set it using a multimeter to 2.25V and 0A (or whatever is specified on the board).

Note: The display is not necessarily accurate, which is why a multimeter is necessary. Make sure that you are pushing the probes against the inner wall to ensure a good connection.




FLUKE
75 MULTIMETER
2.251 VDC
0
10
30
OFF
V~
V⎓
RANG

Step 9: Turn on the high voltage power supply, move the cursor once, and then lower the voltage range to encompass your maximum voltage before breakdown. Keep the maximum current to 1 microamp unless directed otherwise (photo is unable to fully capture the display, but it is displayed to the right of the voltage).

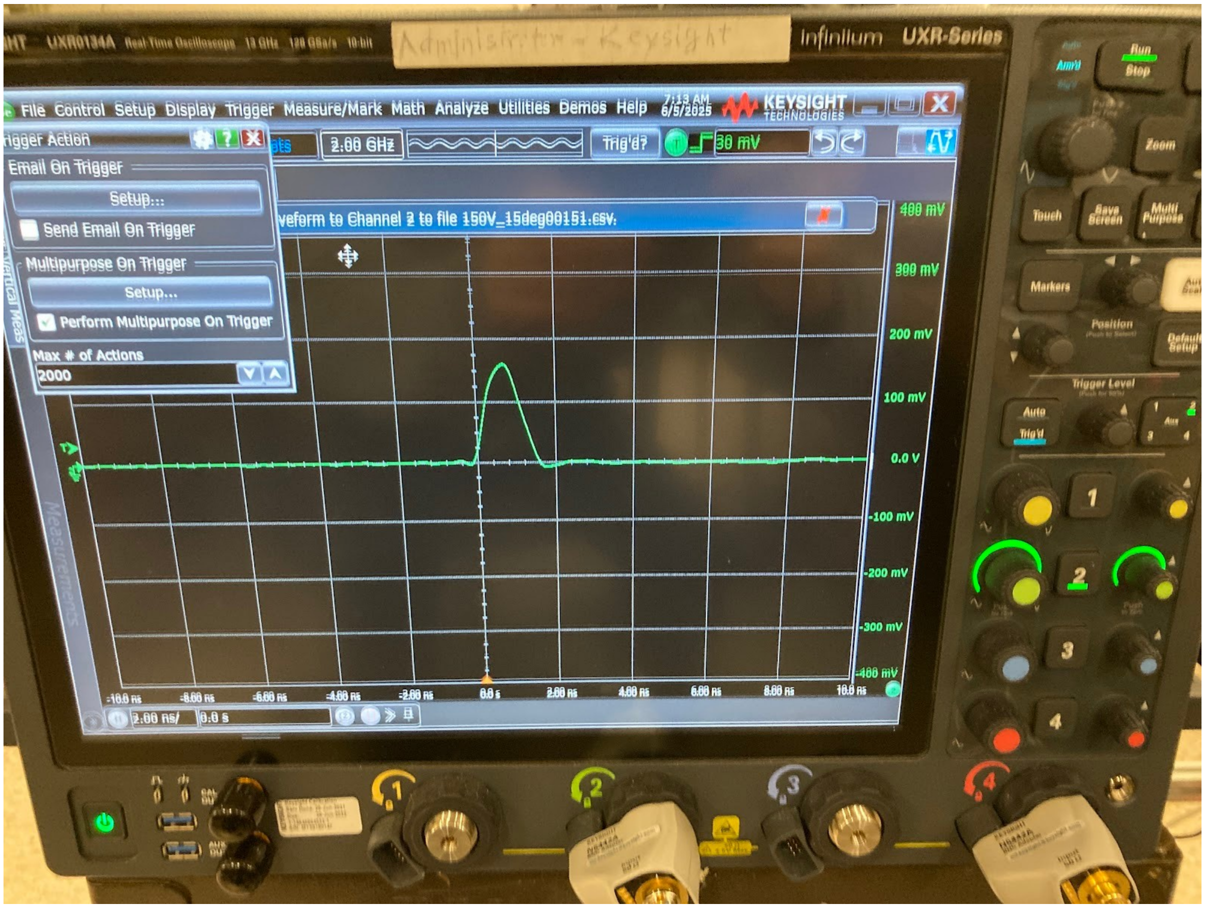


Power
On
Off
---.---mA
AUTO
SrcA: 200 V
POWER
DISPLAY
CONFIG
SRC
MEAS
LIMIT
MODE
DIGITS
SPEED
LOAD
RUN
REL
FILTER
STORE
RECALL
LOCAL
ENTER
RANGE
AUTO
RANGE
CURSOR
PUSH TO EDIT/ENTER

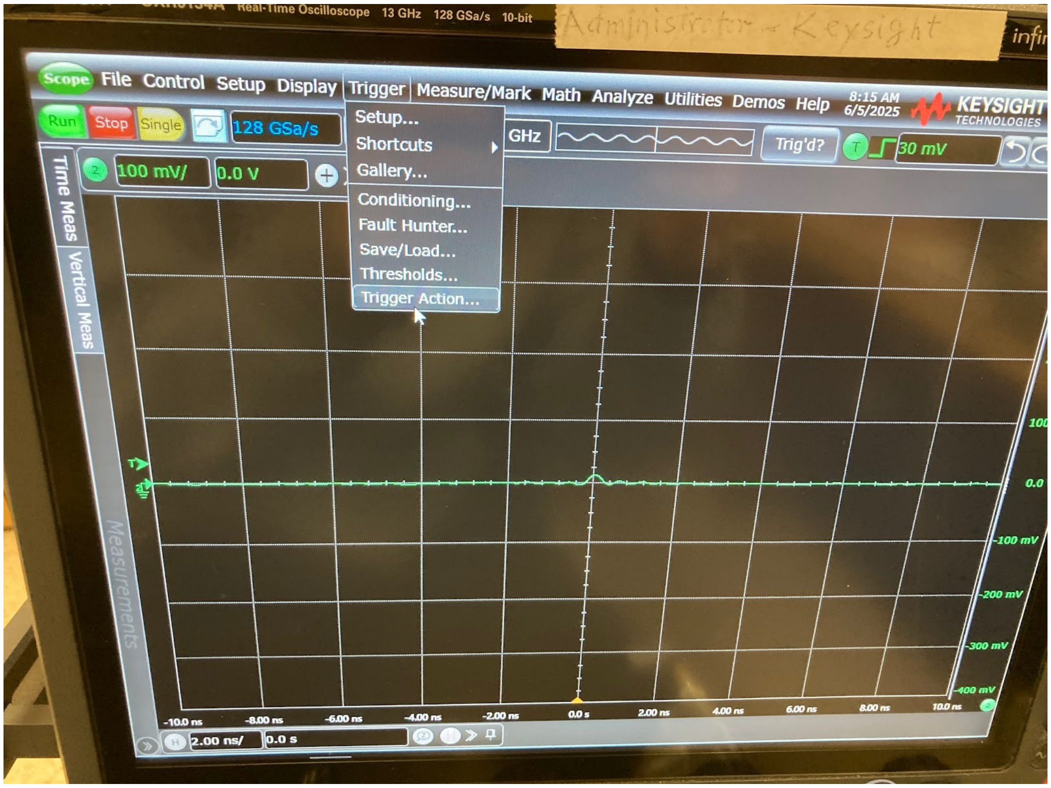
Step 10: Turn on the output, ensure the cursor is on the single digit for voltage, press the button to turn on edit mode, and then slowly ramp the voltage up to the desired range. When ramping up the voltage, make sure that the current does not spike up and stay at that level. Either something wrong has happened with the board or it is undergoing breakdown. It should spike up to 1 microamp and then immediately drop back down to the nanoamp range.

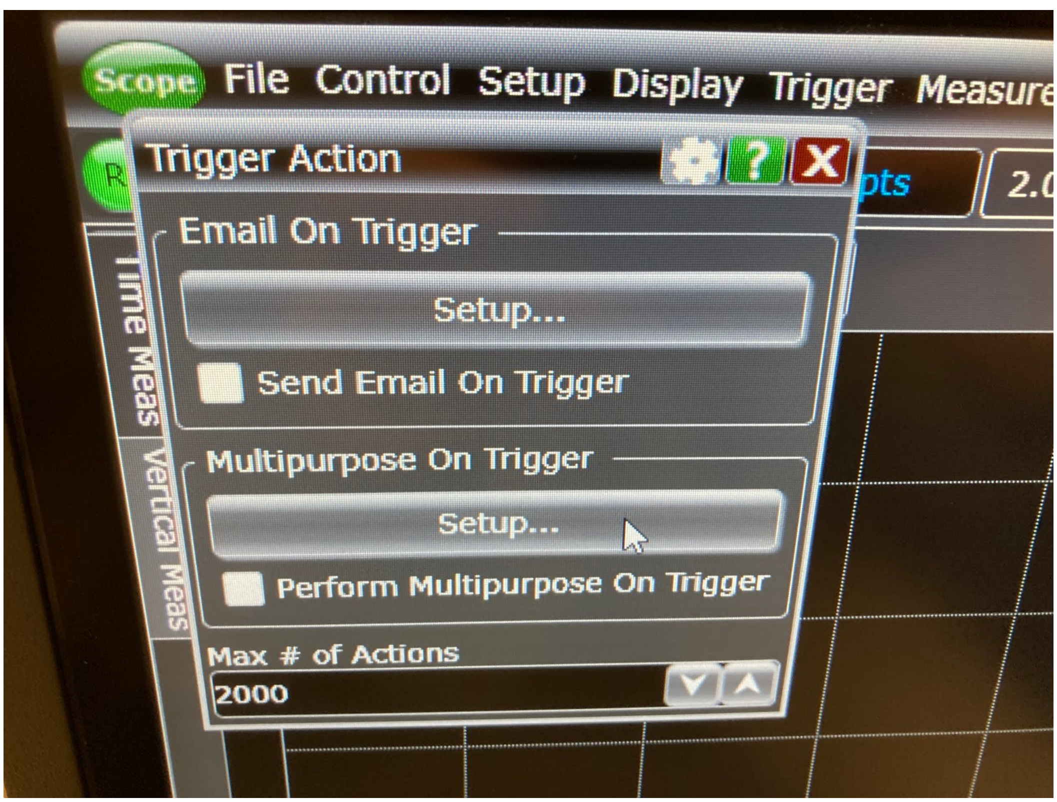

Power
On
Off
DISPLAY
OVP/CC Set
OVP
Adjust
+0.00067n
SrcA:+000.000 V
AUTO
ARM
SRC
MEAS
LIMIT
MODE
2657A
OUTPUT
ON/OFF

Step 11: Turn on the oscilloscope and set it to the ns and mV range. Your threshold should be set such that it minimizes noise while still retaining a reasonable event rate from the alpha source. This is what a waveform should look like.



Step 12: Go to Trigger > Trigger Action > Setup Multipurpose on Trigger.





This is what your file name and path should look like.

C:\Users\Administrator\Desktop\riv\[board type]\[wafer]\[voltage]\[voltage_angle]\[voltage_angle.csv]

Make sure you are saving it as a csv file as the data analysis code only accepts csv files.