



The ferroelectric cathode is activated by the indicated switch allowing the three capacitors ( initially charged to ~ 1KV) to apply a positive pulse to the cathode.

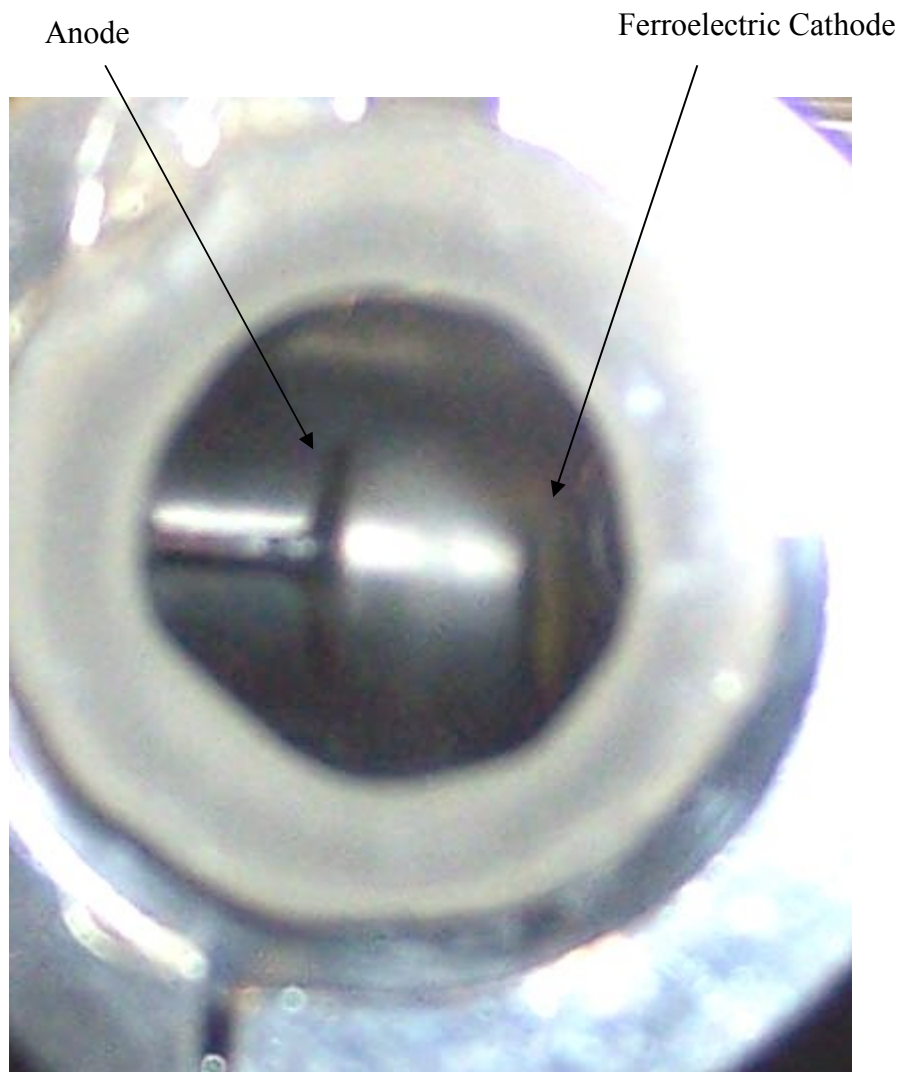


Photo 2 Observation Window From Previous Note

The exact cathode anode spacing has not been determined yet ( guess about 3/4 “); I don’t want to open the vacuum chamber until I am finished. At the moment I can get down to 5E-6 Torr in about 4 hours; however when the system is exposed it takes longer depending on the atmospheric conditions.

Ferroelectric Cathode



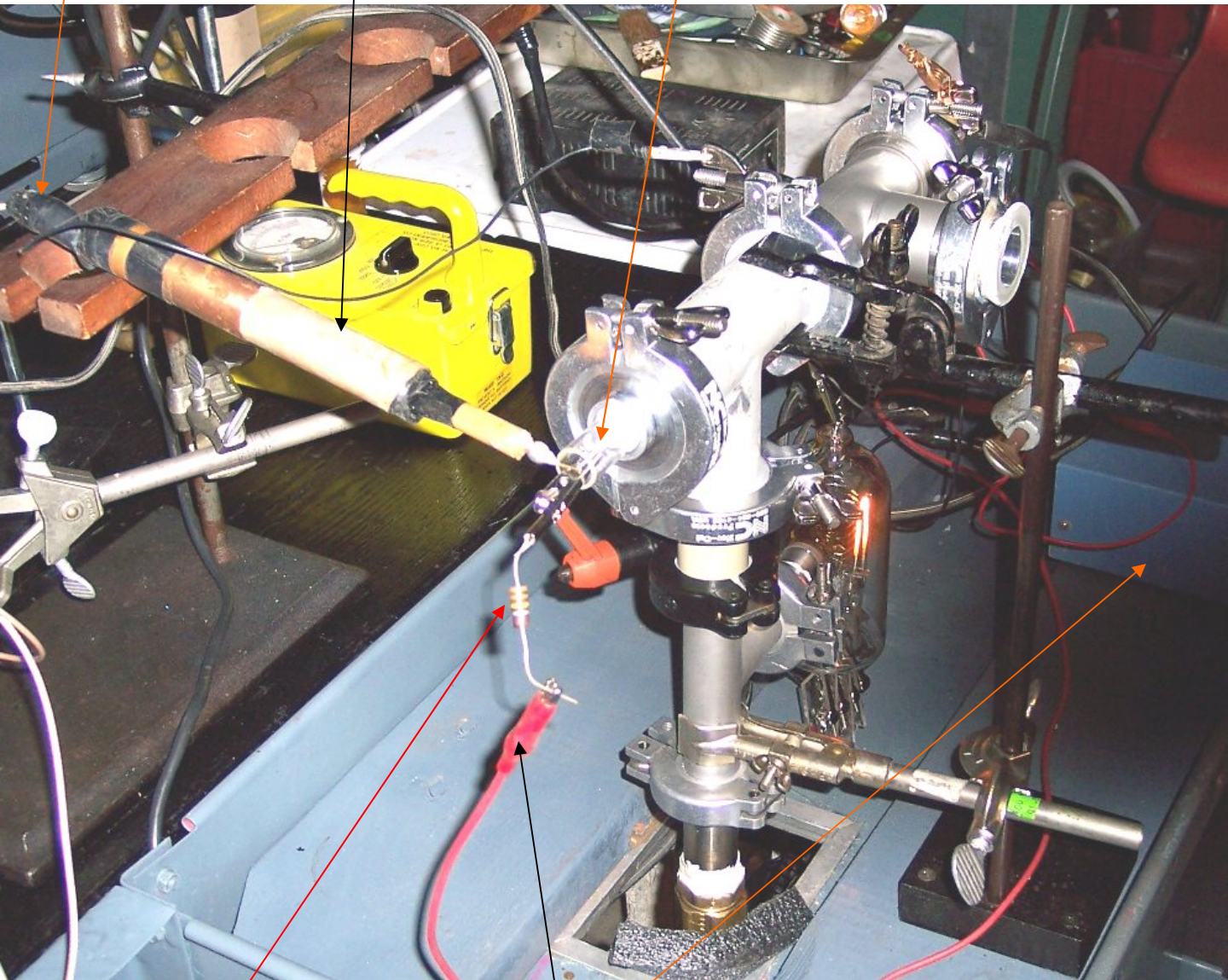
Photo 3 From Previous Note

Photo 4 Anode Electrical Connections ( Resistive Load Only)

To DSO

HV Probe

Anode Input

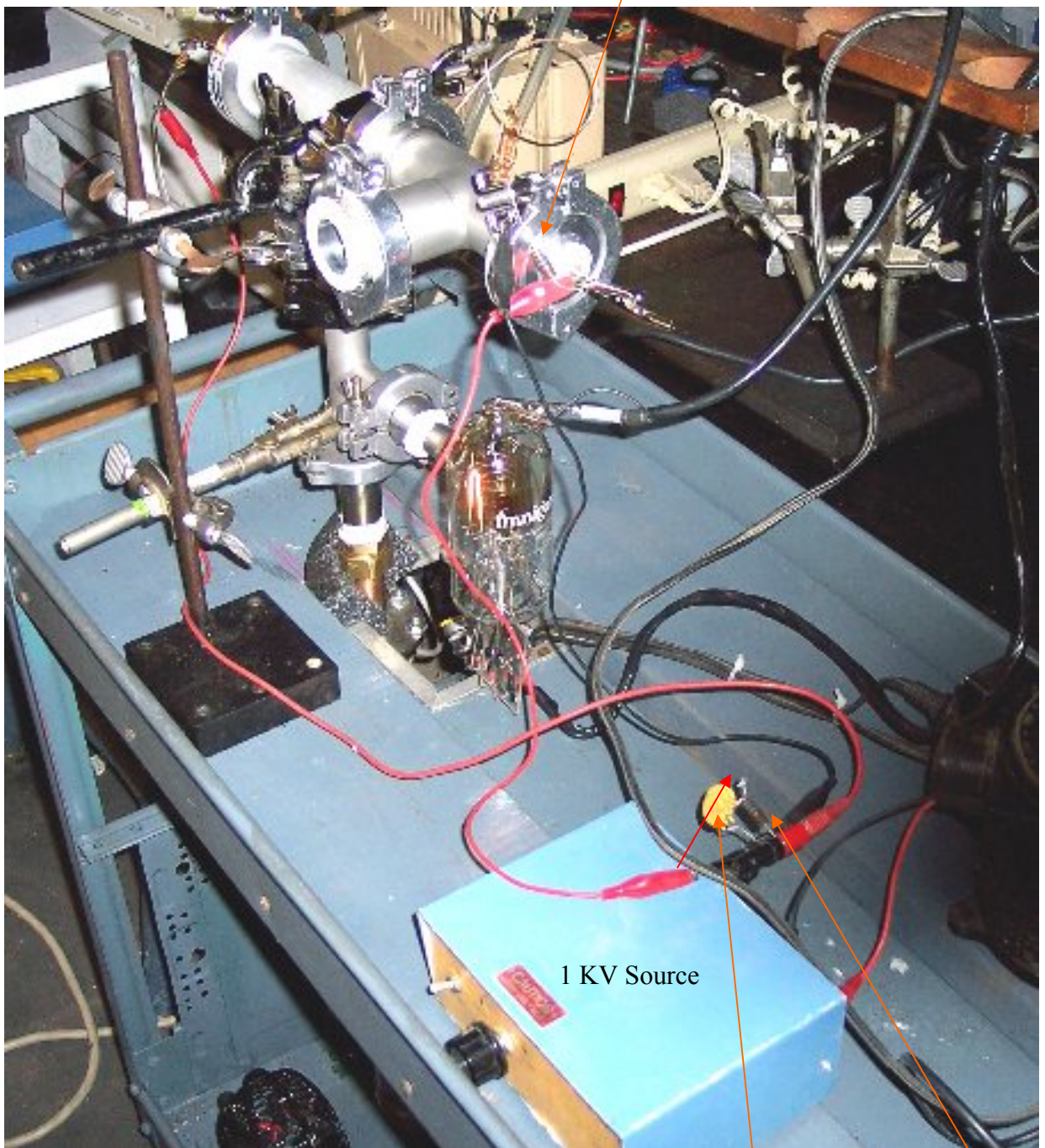


330K resistive load

+ 1KV Source

Photo 5 Cathode Electrical Connections

15 M cathode shunt to GND



Red alligator clip is touched to the charged capacitors ( ie the SW)

Three 2.7nF ceramic capacitors charged via 15 M

Photo 6 Another View

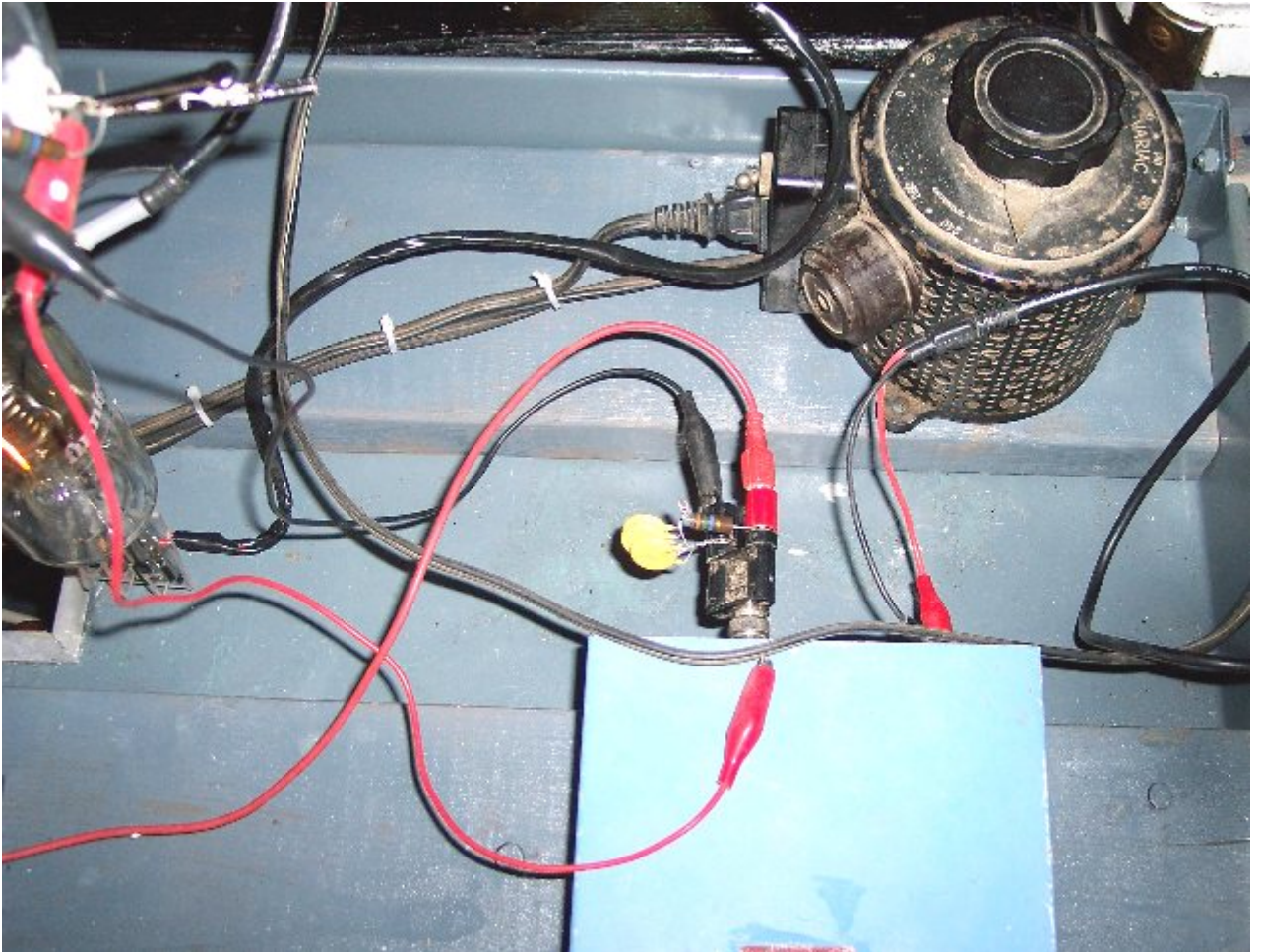


Photo 7 Close up View

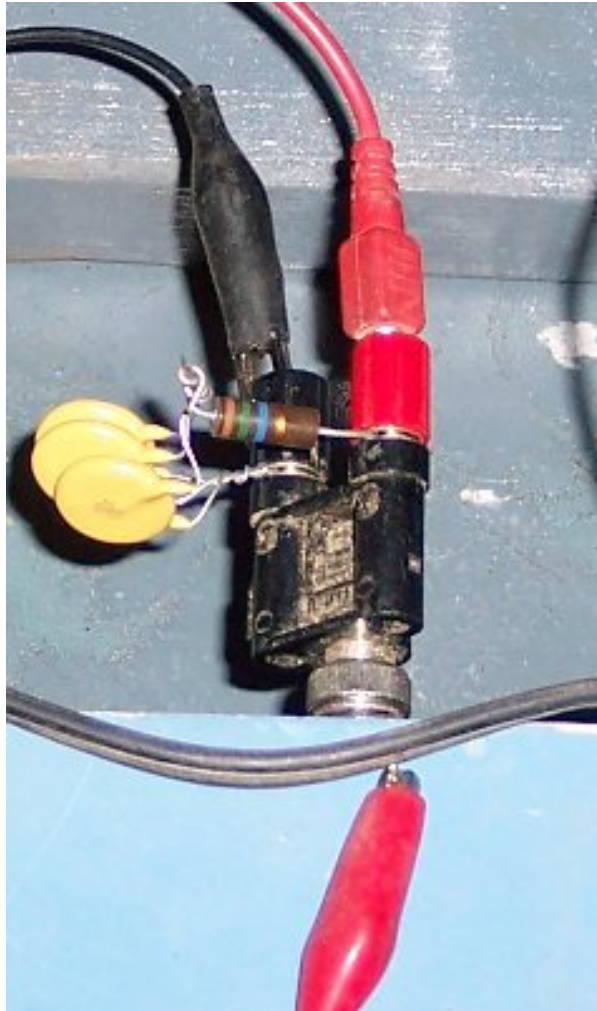


Photo 8 Close up View of the Cathode Connections

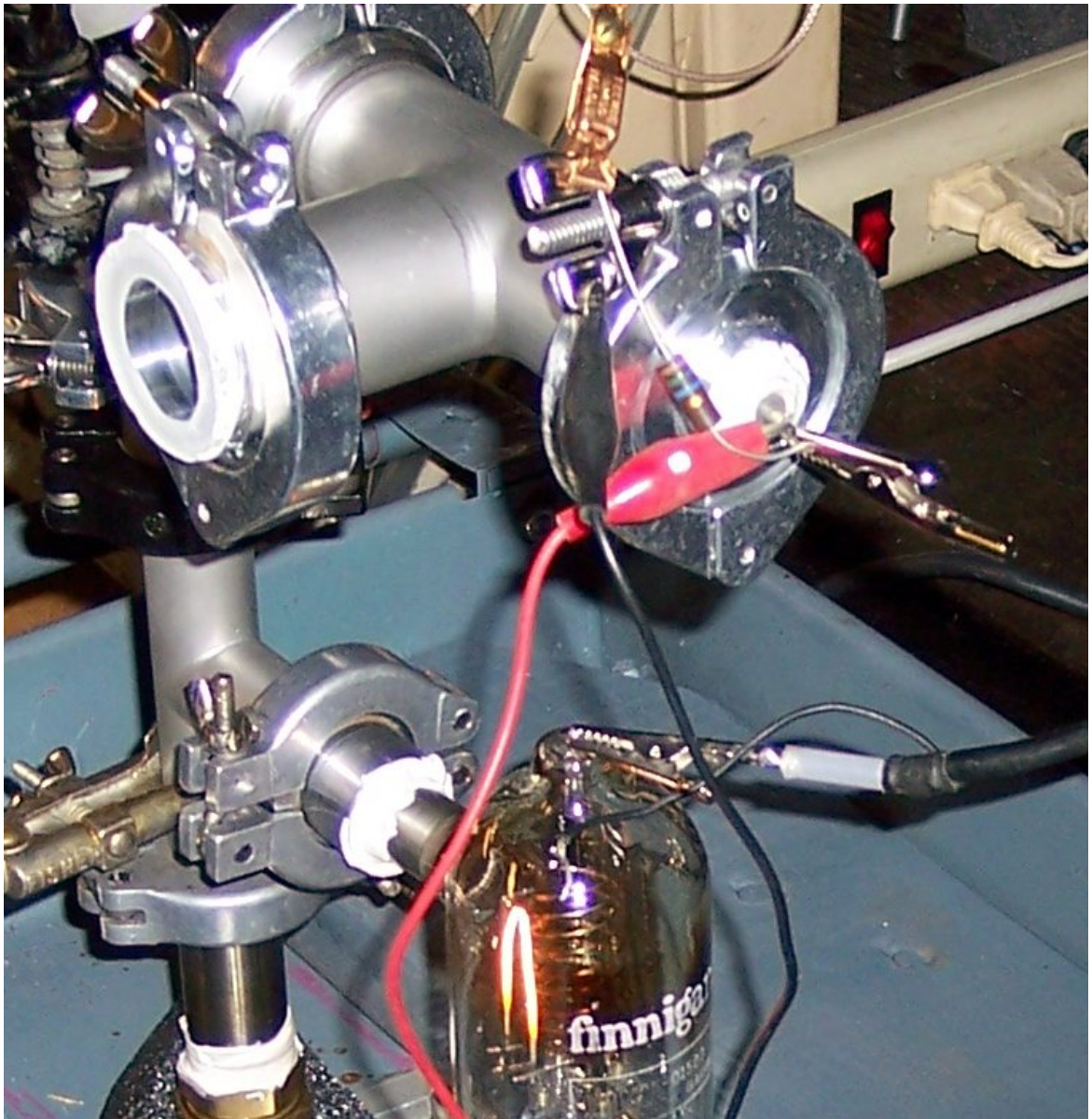
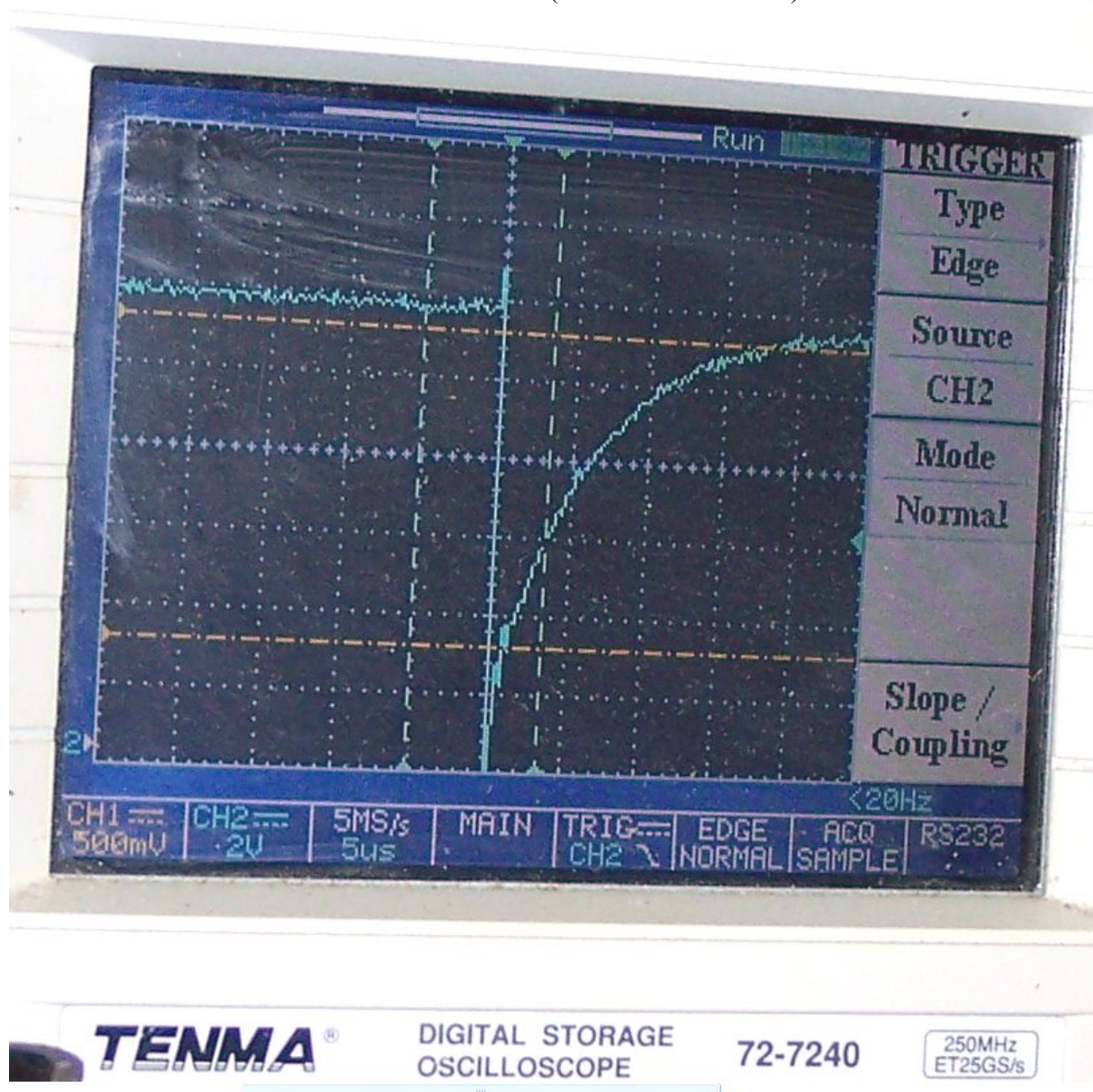


Photo 9 DSO Waveform

X 100 ( Vertical set to X 10)



I have given a rough description of how the ceramic emitting surface was prepared ( nothing even near as good as what has been described in the literature); for this reason I was not expecting great; all I was interested in was to see if the effect could be observed. I was amazed that I got the above!!! However the above pulse waveform initially did not occur every time the red alligator clip touched the three charged capacitors.

I decided to add more capacitors in parallel in order to provide a greater positive pulse; the result was significant and very successful as indicated in the next several pages.

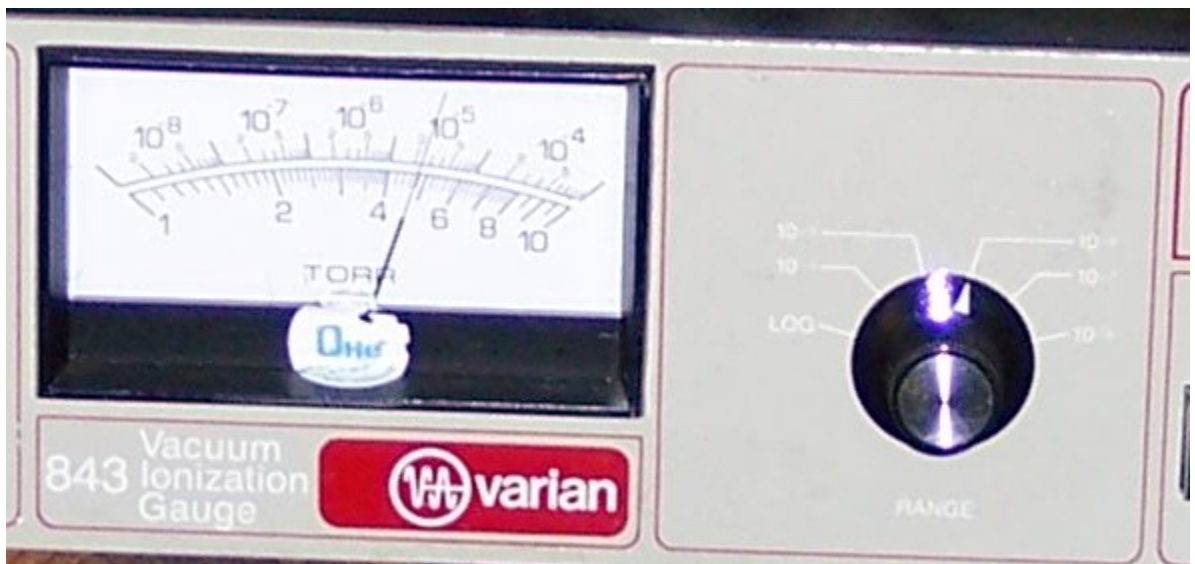


Photo 10 Ion Gauge Pressure 5E-6 Torr

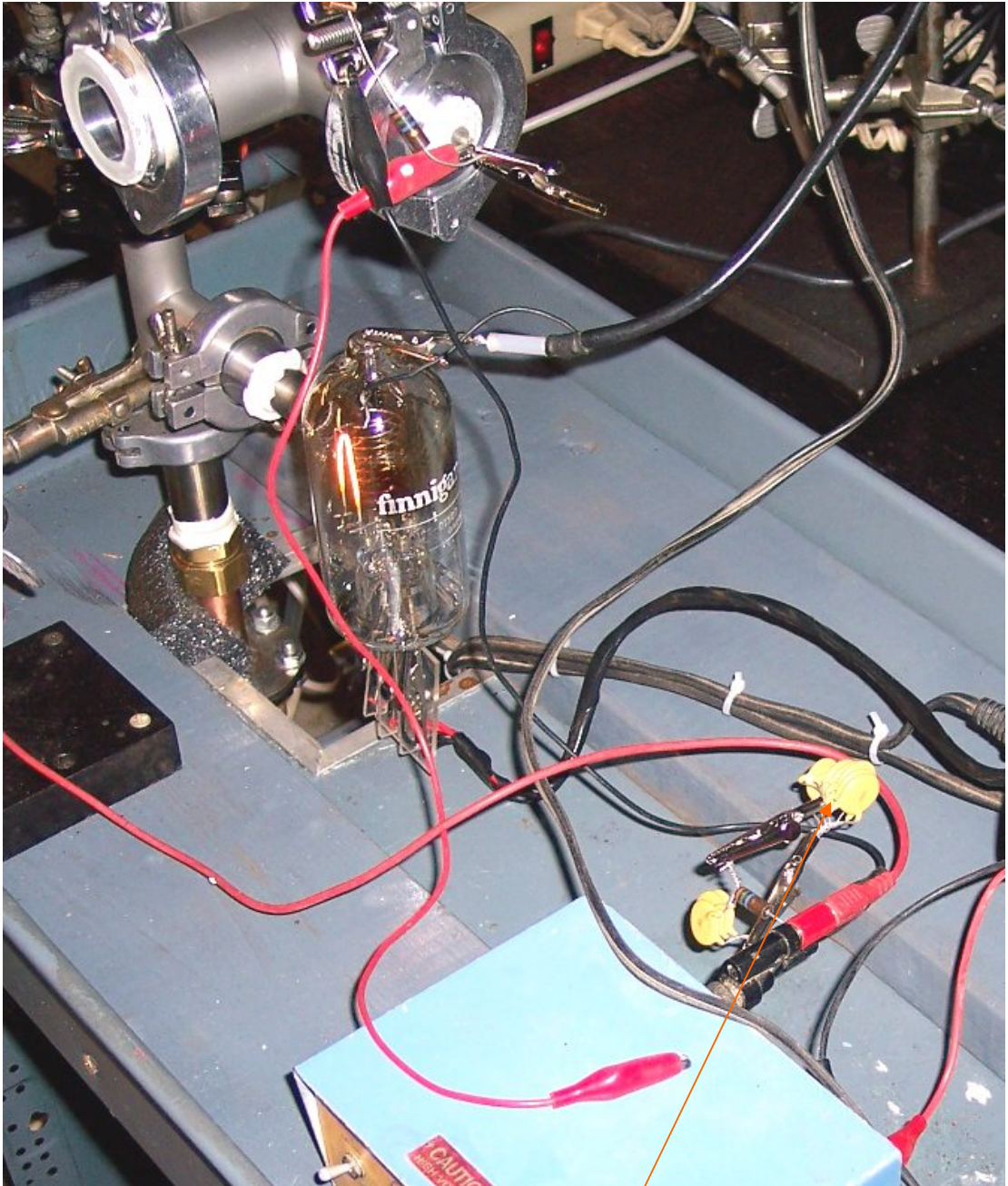
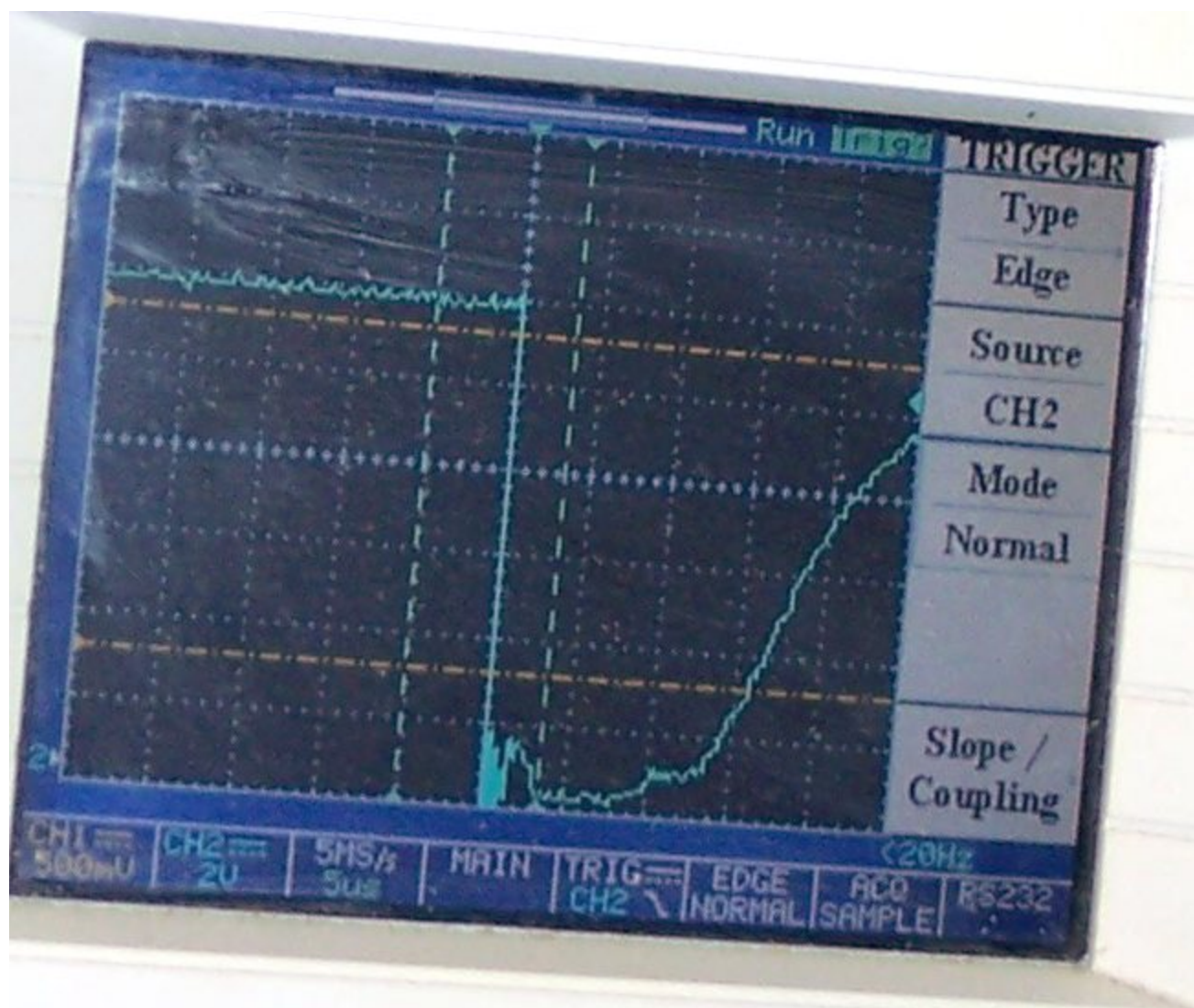


Photo 11 Added Six More Capacitors

Photo 12 Close Up View



Photo 13 Note the Difference from 9 !!



The next day a 10 ohm resistor was connected with the anode loading capacitor to GND; used for current viewing; got 150 volt pulse across the resistor. I know that in the literature 100's of AMPS were reported but 15 AMPS is nothing to sneeze at!! I am shocked ( no pun intended) considering a not so great emission surface was prepared using a X10 Stereo microscope.

The literature indicated a plasma formation ( I have observed infrequent surface flashing at the edge) but mostly tiny sparkling at the locations where I prepared the surface). I have looked carefully in the observation window for any gas discharge; I could not see any surface glow on the anode or between the anode and cathode ( NOTHING @ 5 E-6 Torr) only the cathode surface sparkling.

At this point I can't be 100% certain about ION vs electron flow; I tend to believe most of the current is due to electron flow.

Photo 14 Shunt ( to GND) the Anode With a 2.7NF Capacitor

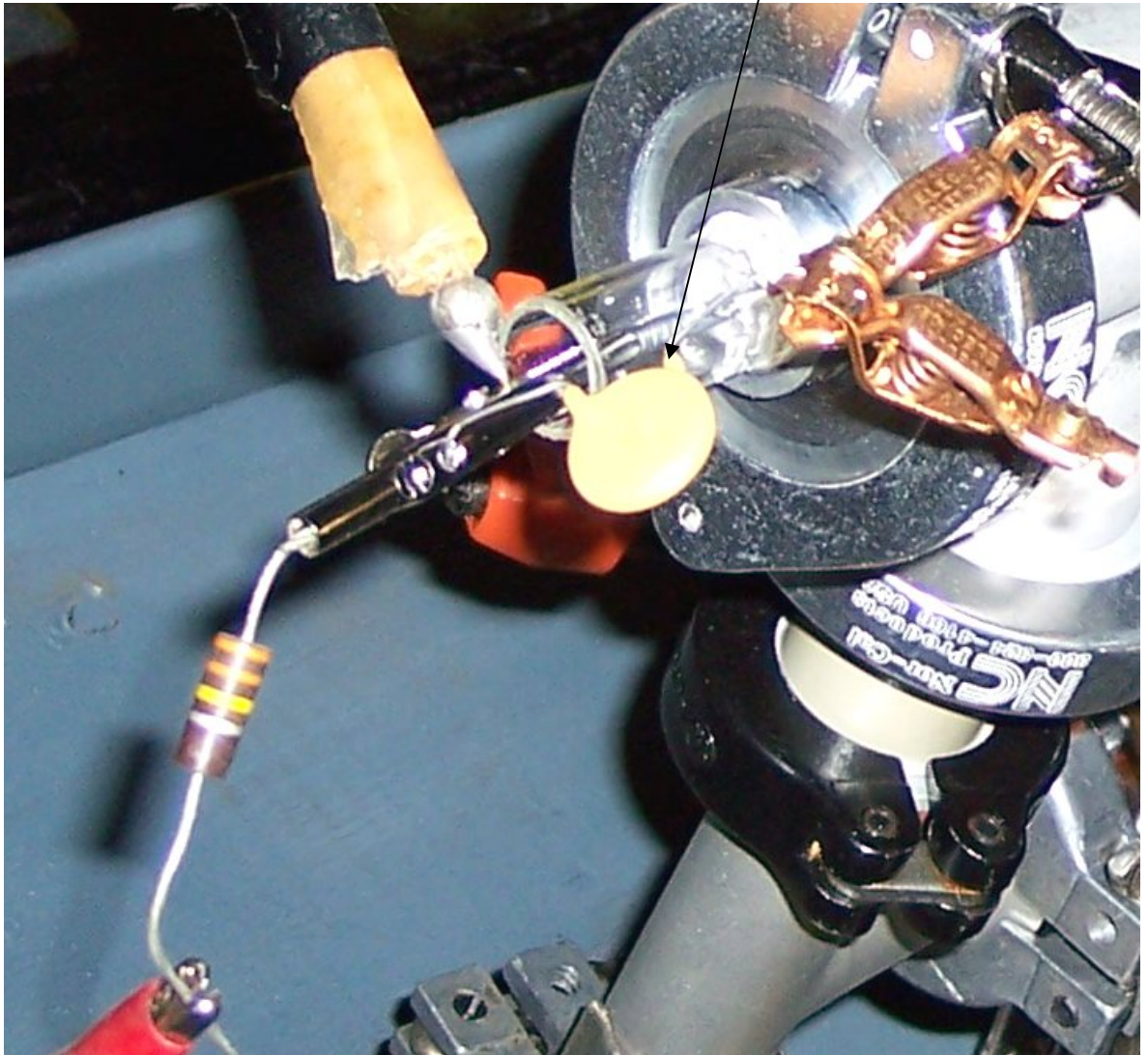


Photo 15 Note the difference !!!

