

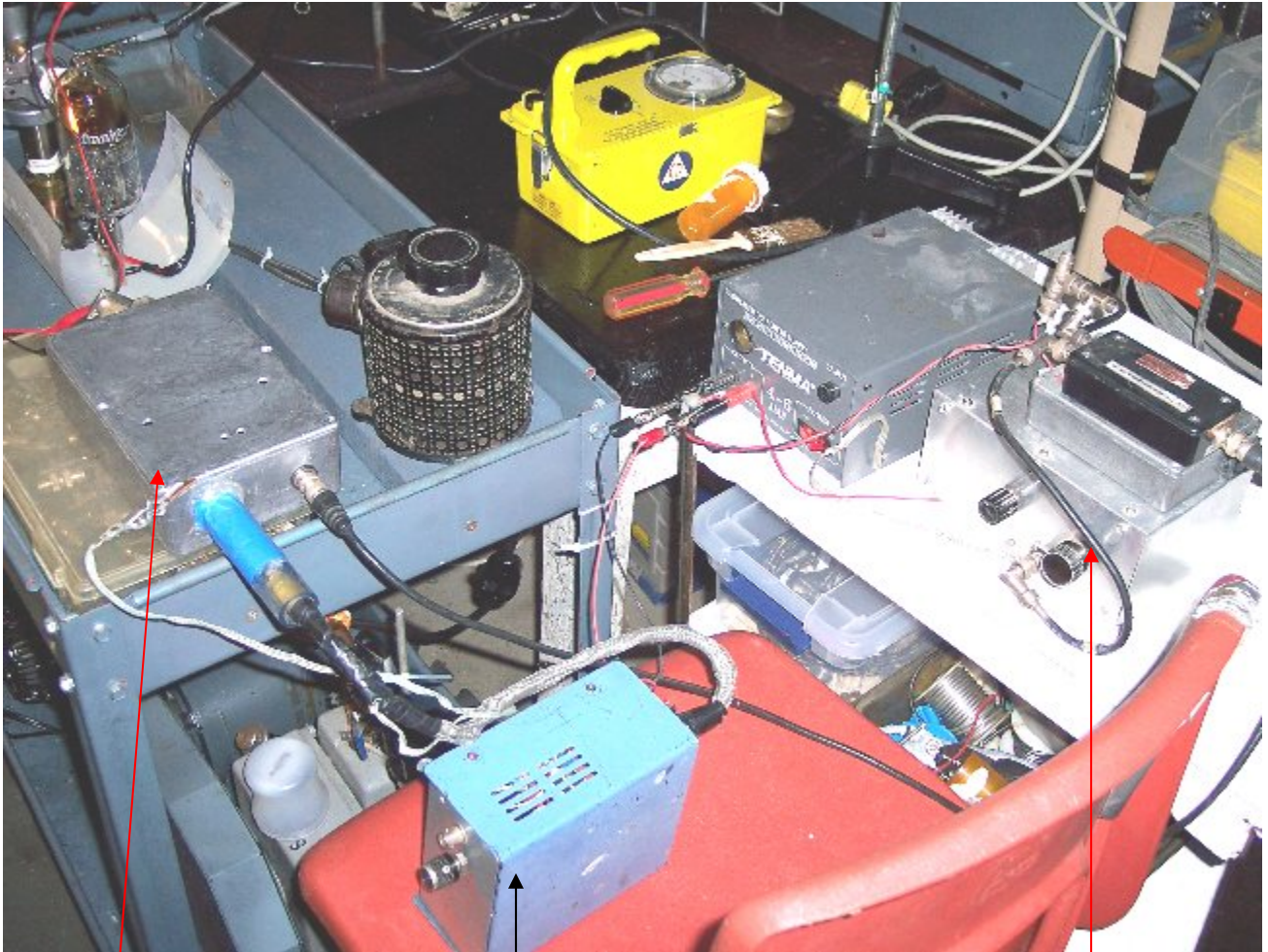
5 June Ferroelectric Experimental Results

Simple Diode Configuration

Test Anode at 6KV 500pF

5 June 2013

Photo 1 Cathode Side of Setup\ change cathode driver to 10 ohm PFN



PFN Driver

PFN PWR source

Trigger Driver

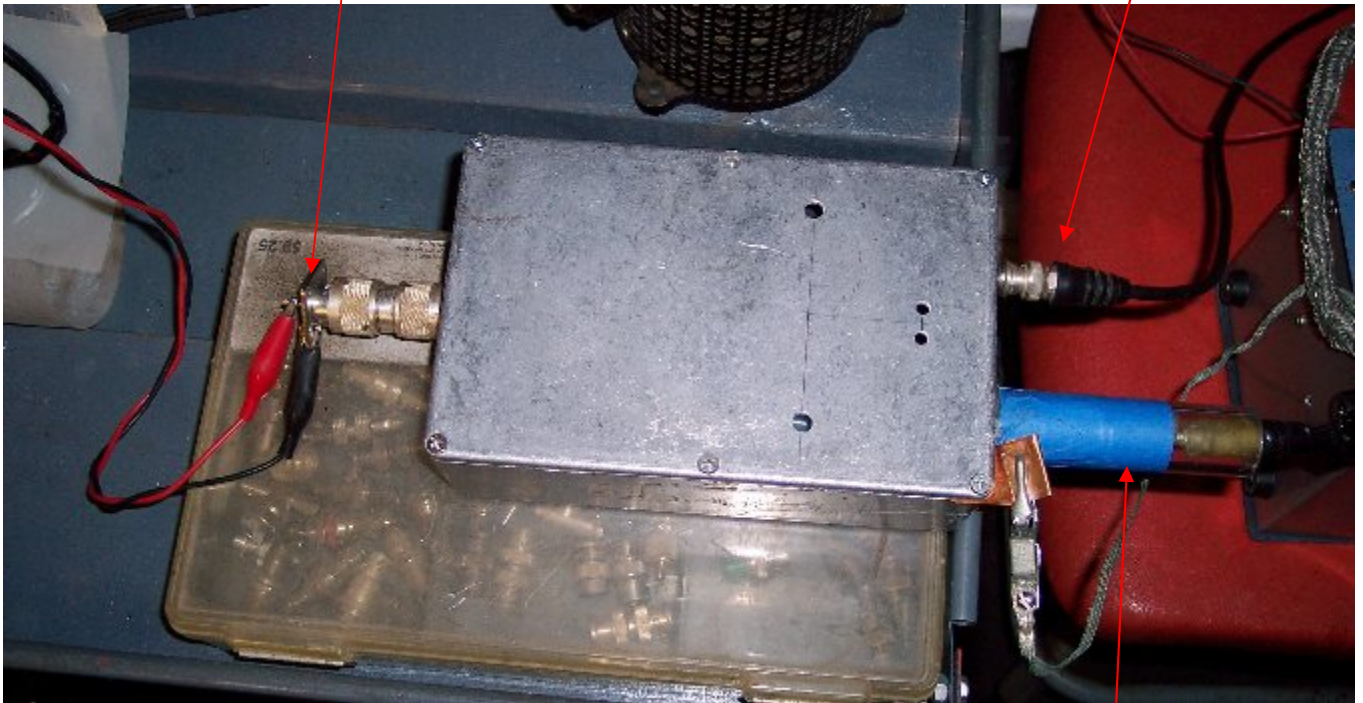
The new cathode driver was to increase the applied voltage to the cathode's back electrode at a 10 ohm operating impedance using a 200 ns PFN. The peak was about 1.5 KV (Photo 10) when loaded with a 10 ohm 1W resistor (Photo 9). However the resistor apparently couldn't handle the peak current after a number of pulses; it increased its value as I later observed noting the applied pulse increased to about 2 KV (no photo) with an exponential fall towards the bottom of the falling edge.

From the observation view I can see no evidence of sputtering (haven't seen it face on yet); I have tested it yesterday with 2.7nF capacitor at 22KV and the cathode seen through the observation window shows some increase in surface speckled scintillation at about 4 to 5 E-6 Torr. The anode DSO waveform hasn't changed much in 4.5 hours.

Photo 2 Close up of PFN system

OUT

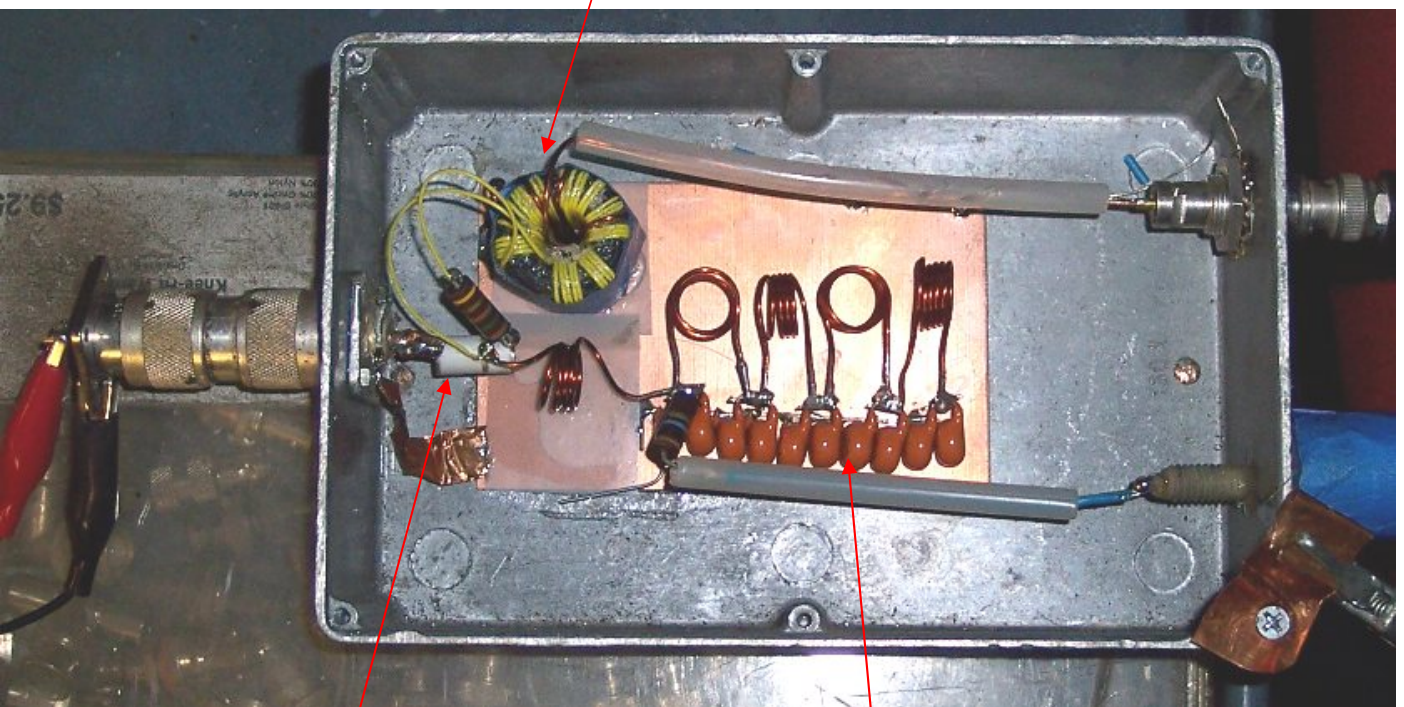
Trig. IN



PWR IN

Photo 3 Interior view/PFN

Trig. Transformer



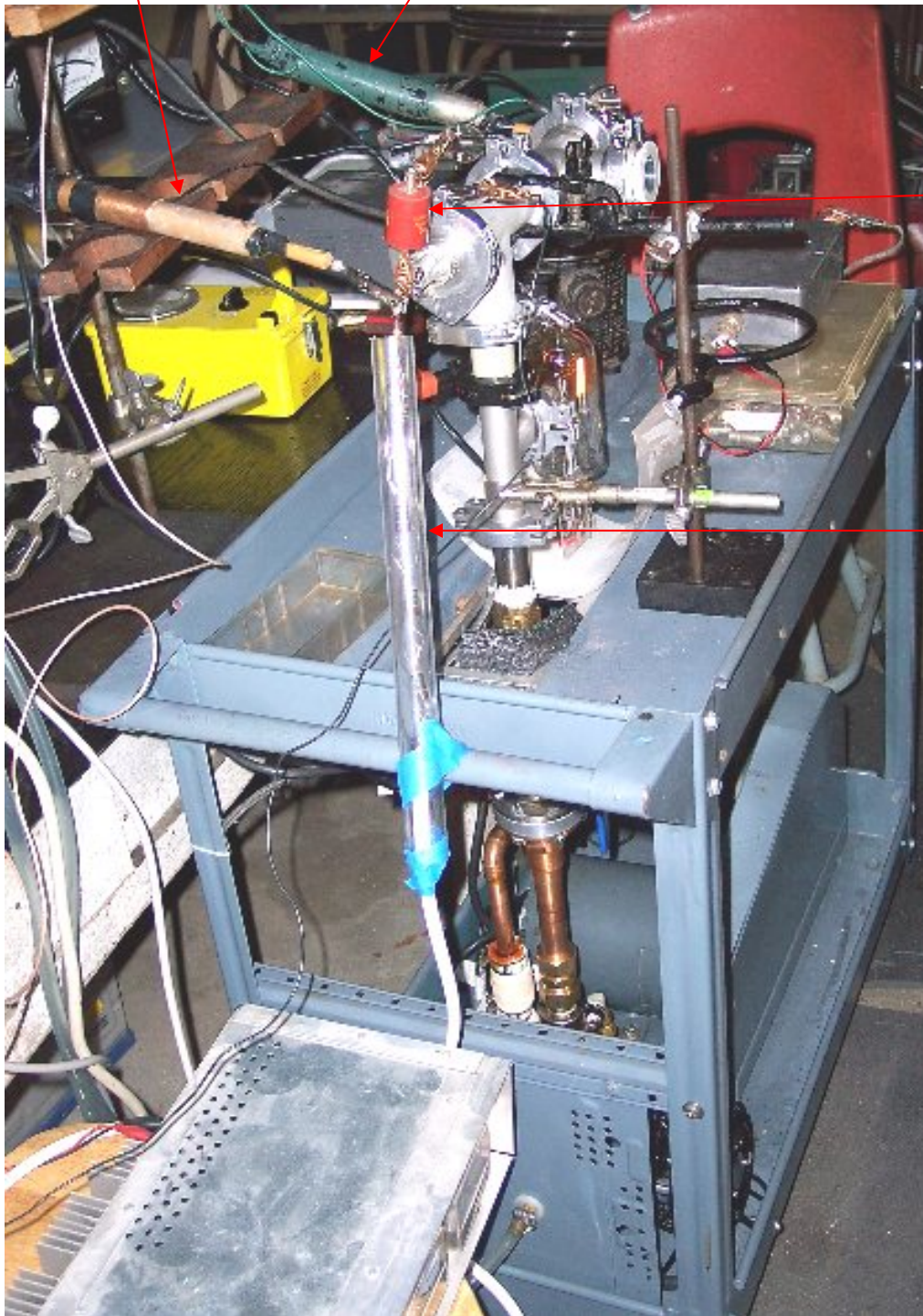
High Energy Devices TX4.5

10 Ohm ~ 200ns PFN

Photo 4 Anode Side

1000X DSO Probe @ Anode

1000X DSO Probe @ Cathode



500nF
charged to
6 KV

~ 60M
Charging
resistance

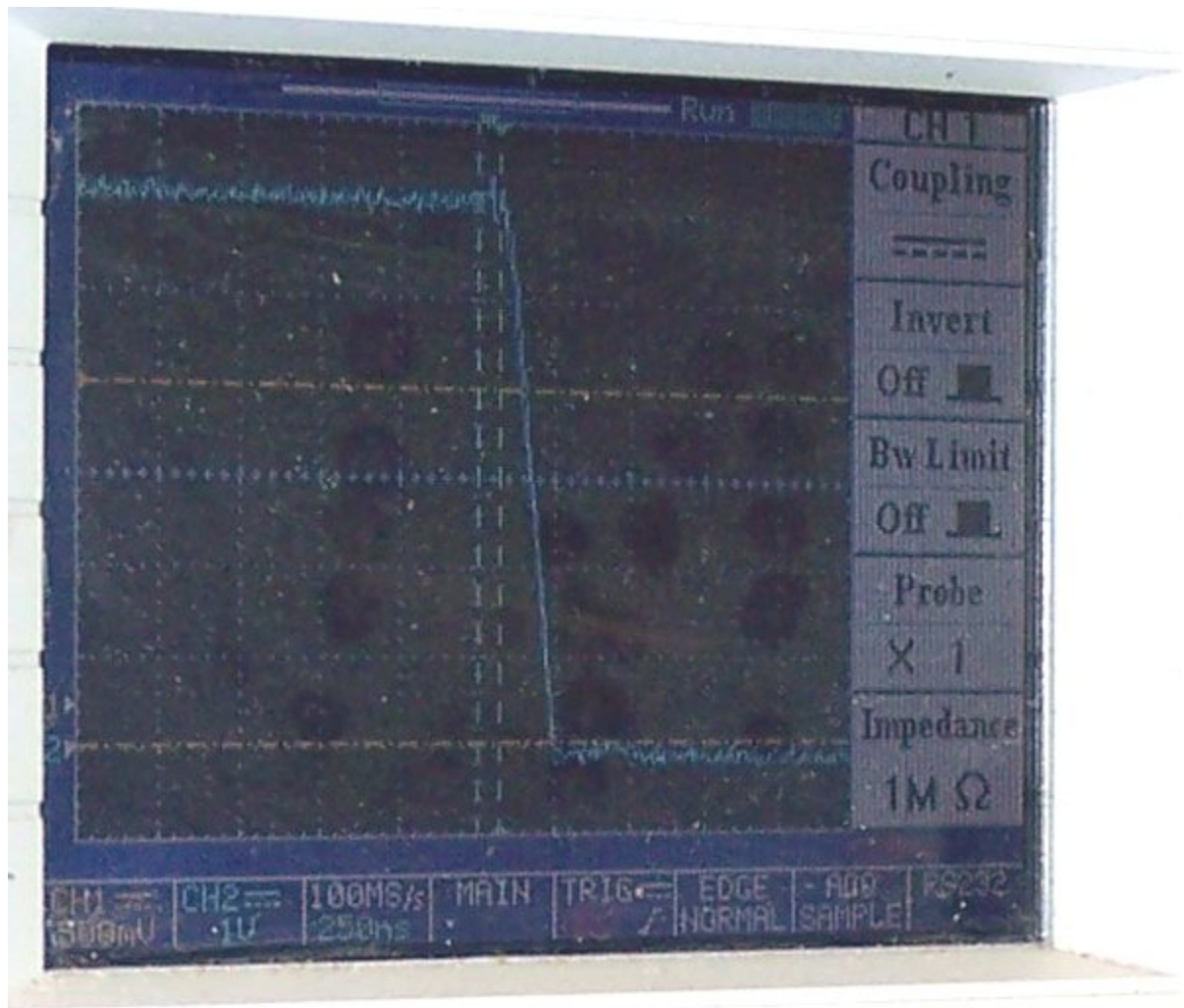
Anode HV PWR

Photo 5 Anode PWR



~ 0 to 22KV

Photo 6 Waveform Anode to GND

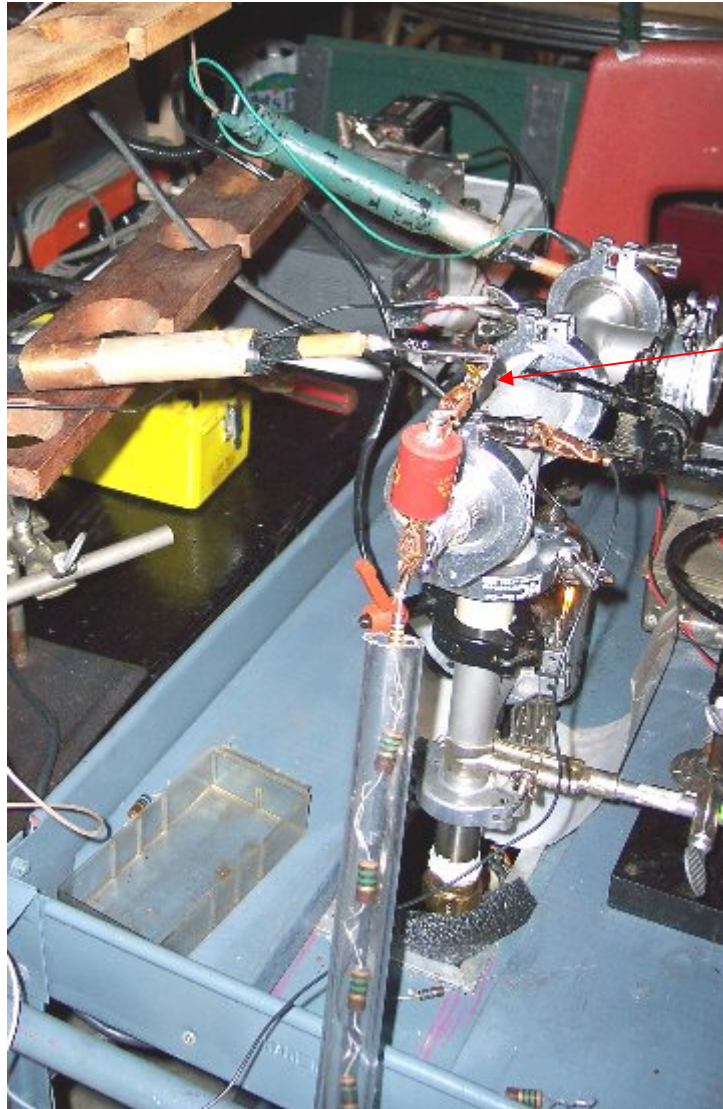


1KV / Div

250ns / div

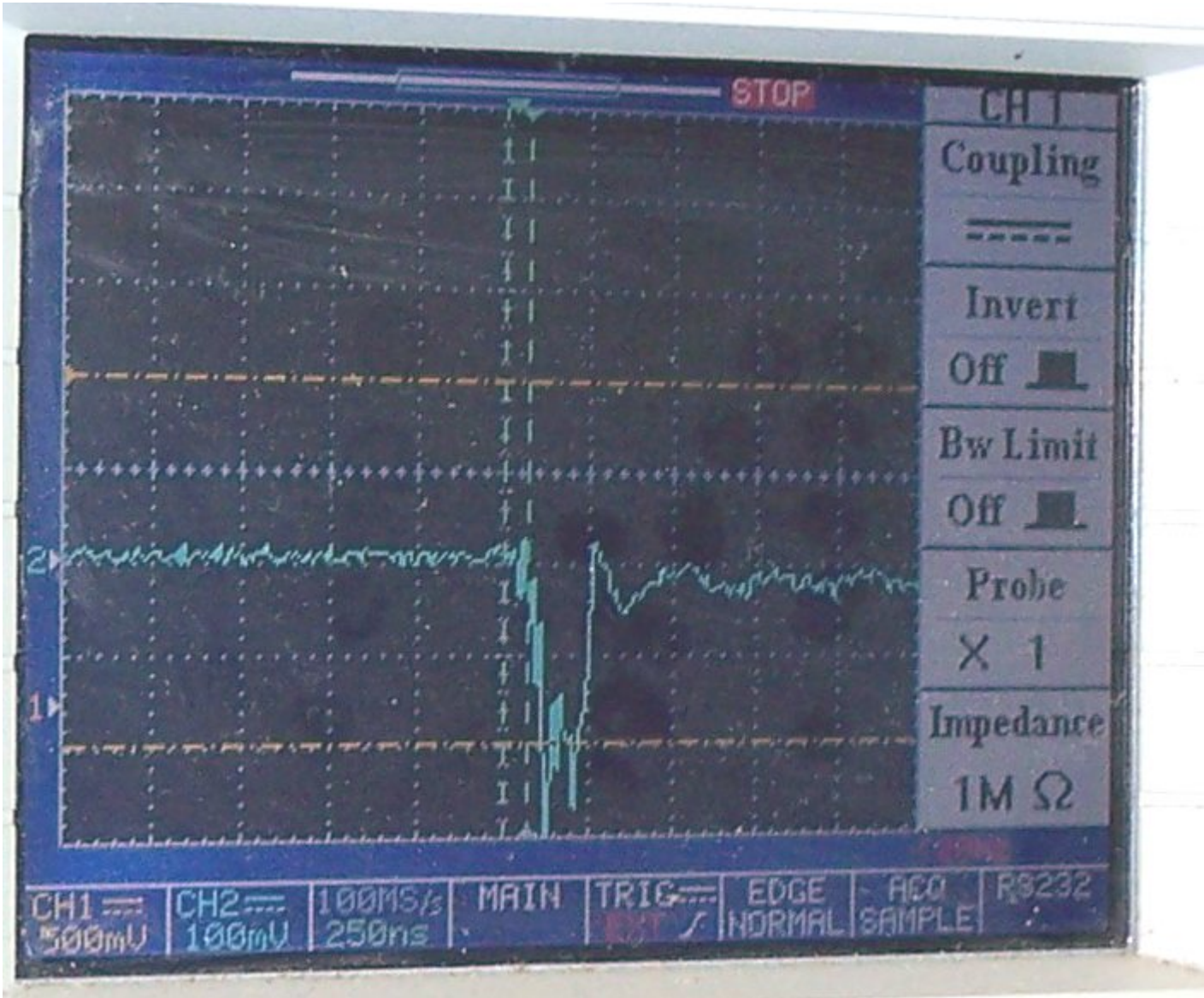
The ferrocathode was tested at a PRF of ~ 2 PPS for about 4.5 hours. The anode was loaded with a 500Pf ceramic capacitor charged to about 6 KV with an associated 20 AMP peak (Photo 8).

Photo 7 1000X probe use for measuring across the 10 Ohm CVR



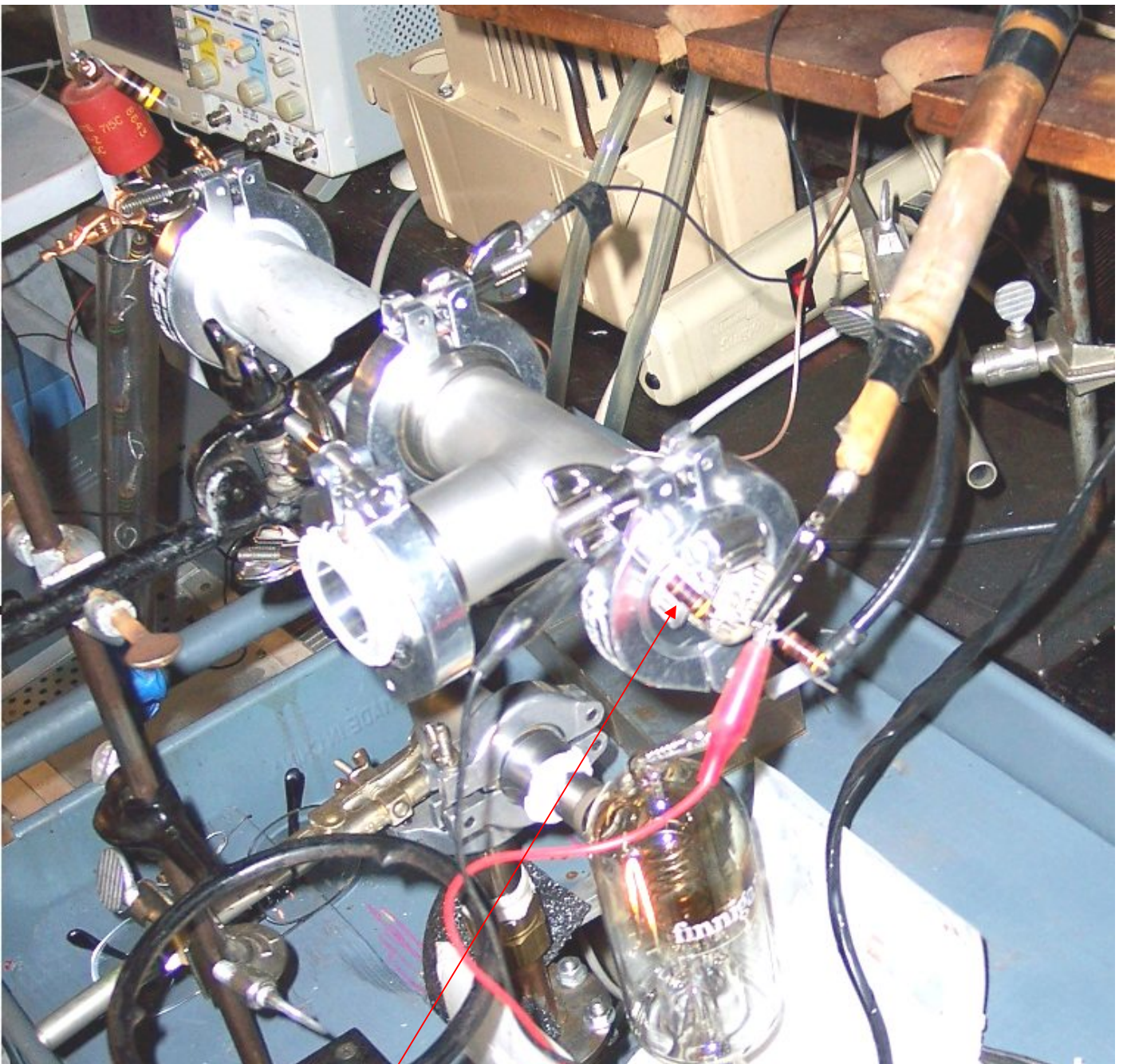
CVR

Photo 8 DSO Waveform of CVR



100V/ div => ~ 20AMPS peak

Photo 9 1000X Probe at cathode ferrite back electrode



10 Ohm PFN matching load

Photo 10 Early waveform across PFN 10 ohm load resistor

