Stun guns are used today as an alternative to a firearm. Stun guns are used to subdue a target. It uses high voltage to stun and send shock waves through the target's body to weaken or paralyze the target.
Introduction

- Using a 555 timer produce a current fluctuating signal.
- Then this low current fluctuating signal will be fed through a NPN power transistor creating a AC voltage.
- Then ramp up the voltage using a step down transformer in reverse and five stages of voltage doublers.
- The stages will consist of capacitors and diodes.
Block Diagram

9 Volt Battery
Direct Current

555-Timer
Pulsating Electric Signal of Low Current

NPN Darlington Power Transistor
Switch turns off and on allowing an Alternating Current.

1k:8 Turn Audio Transformer
(Hooked up in reverse)
This stage will produce 1024 Volts to the primary

5 Stages of Voltage Doublers
Generating 10KV of DC voltage.

Output
~10,000 Volts of DC voltage.
Specifications

- Timer set to a 50/50 duty cycle.
- Low Voltage (LV) Analysis:
  \[ R1 = 32.2\, \text{kOhms} \text{ and } C = 9.8\, \text{nF} \]
  Time Constant of Timer:
  \[ \text{Frequency} = \frac{0.72}{R1 \times C} = 2,281.7 \, \text{Hz} \]
- Transformer Specifications:
  Frequency Range: 300Hz to 3,400Hz
  Primary: 1kOhms Secondary: 8 ohms
Results

- Timer/Transistor: Output of 5.64 Volts at 1948Hz.
- Able to produce 3628 Volts on the output of the circuit.
- Fixing the connectivity issue should allow the circuit to obtain the 10,000 Volts that was the goal of the
- Transformer began to start making noise which concludes testing the high voltage stage of the circuit.
Problems

- Transformer is making noise due to it being magnetically excited by an alternating voltage and current so that it becomes extended and contracted twice during a full cycle of magnetization.\[^2\]

- I personally did not have a soldering iron and was not able to solder my whole circuit which would have made the circuit function correctly.
Conclusion

- Circuit takes a 9 Volt battery input and converts it to High Voltage between 1000 Volts to 10,000 Volts.
- Circuits need to be soldered to make sure that each component is making good contact with one another to produce the maximum 10,000 Volts.
- Transformer parameters are not being met or being exceeded in some aspect.
References

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