

MINI TESLA COILS

TESLA COILS ARE AMAZING AND AWESOME MACHINES. THEY GENERATE HIGH VOLTAGE AND SUPER HIGH FREQUENCY AC.

The first circuit is a simple hv solid state tesla coil. It uses only 9 parts yet will produce amazing output voltages.

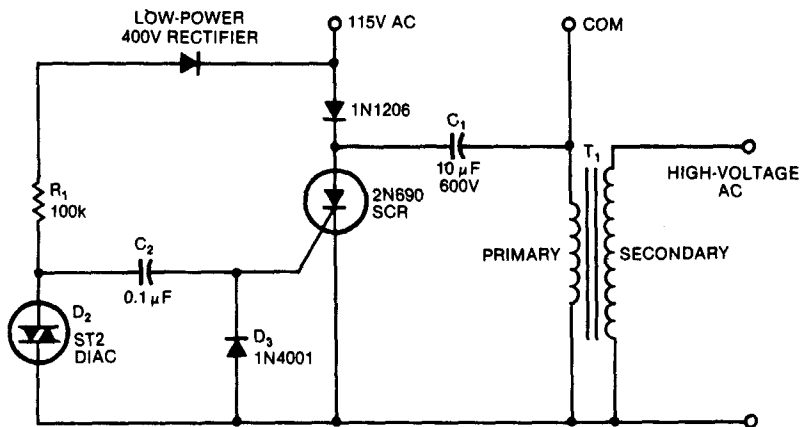
The second circuit is better. The ignition coil will withstand over 85kv but use hotglue to insulate the electrodes from the spark. This circuit only uses 6 parts.

Both use standard wall current at 115vac at 15amps.

Insulate each circuit using hotglue and silicon or epoxy. You can make them portable by use of a power inverter.

Uue sells parts for this project. We have special ignition coils that will make 10inch arcs.

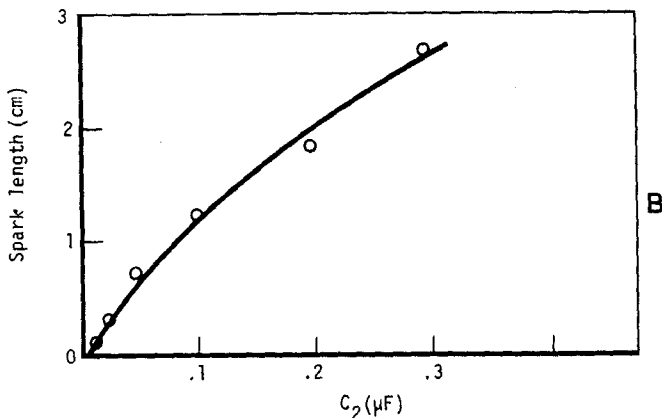
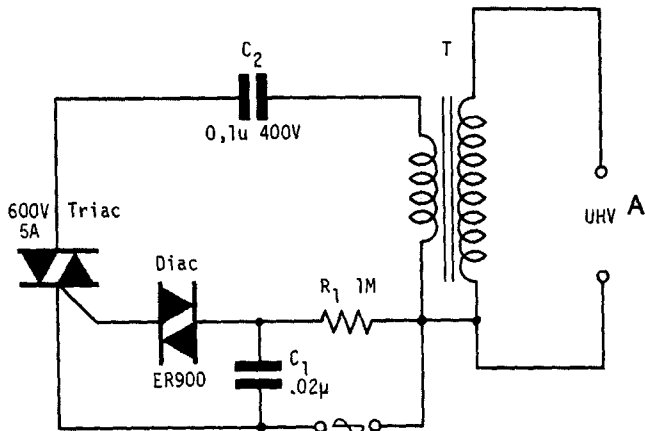
Here are the schematics and circuit notes.



NOTES:

$T_1 = 8 \text{ mH AT } 5\text{A DC, } 1:230 \text{ TO } 1:500$
 TURNS RATIO, 0.45Ω PRIMARY-
 RESISTANCE, $10\text{-k}\Omega$ SECONDARY-
 RESISTANCE AUTOMOBILE
 IGNITION COIL
 $C_1 = 10\text{-}\mu\text{F, } 600 \text{ WV DC, OIL-FILLED}$
 PAPER CAPACITOR

This circuit can generate high-voltage pulses with an inexpensive auto ignition coil. Add a rectifier on the output and the circuit produces high-voltage dc. The circuit's input is 115 Vac. During the input's positive half cycle, energy is stored in capacitor C1, which is charged via diode D1 and the primary winding of transformer T1, the coil. The SCR and its trigger circuitry are inactive during this period. During the input's negative half cycle, energy is stored in capacitor C2 until diac D2 reaches its trigger voltage, whereupon D2 conducts abruptly and C2 releases its energy into the SCR's gate. The SCR then discharges C1 into the transformer's primary and ceases to conduct. This store-and-release cycle repeats on the line's positive and negative half cycles, producing high-voltage pulses at the transformer's secondary.



Circuit Notes

By repetitively charging and discharging a capacitor through the primary of an induction coil with a high voltage, an ultra high emf is induced in the secondary. Switching is performed by the triac, triggered by the disc at times set by C₁ and R₁. With a 12 V car ignition coil for example, the length of sparkgap obtained is 12 mm of air for C₂ = 0.1 μF. If the dielectric strength of air is assumed to be 3 kV/mm, this spark-gap length corresponds to 36 kV. From the curve shown in Fig. B, care must be taken in keeping the value of C₂ below 1 μF as the coil is liable to be seriously damaged at this value of C₂. Power consumption is only about one watt.