# RUBY LASER POWER SUPPLY DESIGNS

RUBY LASERS WORK ON A VERY SIMPLE CONCEPT OF PUMPING THE ROD UNTIL IT IS EXCITED AT A LEVEL THAT IT STARTS TO PUMP ITSELF FOR A FRACTION OF A SECOND AND RELEASES LIGHT OUT OF EACH END.

RUBY LASERS CONSIST OF 5 PARTS TO WORK COMPLETELY:

1. RUBY ROD
2. FLASHLAMP OR ARCLAMP
3. HIGH VOLTAGE FLASHLAMP SOURCE
4. TRIGGER AND TIMING CIRCUIT
5. END MIRRORS
6. AND SOMETIMES A COOLING SYSTEM LIKE A FAN OR WATER

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WHAT IS THE THEORY OF OPERATION, SIMPLIFIED...

For anyone who knows how a ruby laser works, this will be a review. A ruby laser only requires a few main components to work. They are: a ruby rod, a flash lamp, a fully silvered mirror, a partially silvered mirror and a power supply. The power supply supplies a steady current to the flashlamp. The power supply then sends synchronus triggers to the flash lamp to ignite it at a consistent rate. The flash lamp is parallel to the ruby rod. The mirrors are at each end of the ruby rod. The strobe or flash from the flash lamp excites the chromium atoms in the ruby which release photons each time they are "pumped" by the flash. These photons are bounced back and forth between the mirrors until they reach the point they "break through" the partially silvered mirror or reach a switch point. The usually red beam is very powerful.

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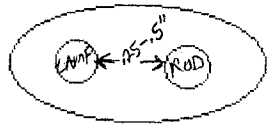
MOST FLASHLAMPS REQUIRE A SPECIFIC VOLTAGE BASED UPON THEIR DIAMETER AND LENGTH. FOR EXAMPLE A 3 INCH ACTIVE AREA FLASHLAMP AT ¼" DIAMETER WOULD REQUIRE ABOUT 1200-1500VOLTS FROM A CAPACITIVE CHARGE OF 1uF to 5uF.

WE WILL INCLUDE A TRIGGER CIRCUIT FOR THOSE OF YOU THAT ARE GOING TO USE A Q-SWITCH...A Q-SWITCH IS A MIRROR ON A MOTOR THAT HAS A MAGNETIC PICKUP,,,IT IS USED TO BUILD UP A BURST OF LIGHT BY BOUNCING THE LIGHT BACK INTO THE ROD UNTIL SWITCHED OUT...THEY USUALLY RUN AT ABOUT 30,000RPM.

THE POWERSUPPLY WE ARE GOING TO SHOW YOU IS VERY SIMPLE AND WILL PUMP A ROD UP TO 3" IN LENGTH AND ¼" IN DIAMETER...A ROD WITH THESE SPECIFICATIONS COULD EASILY BURN HOLES IN STEEL.

FIRST YOU WILL NEED TO BUILD A CAVITY FOR YOUR ROD AND FLASHLAMP. THEY ARE USUALLY OVAL SO THAT THE ROD AND LAMP ARE NEXT TO EACH OTHER ....

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THE BEST MATERIAL TO USE FOR A CAVITY IS A POLISHED ALUMINUM SECTION THE SAME LENGTH AS THE ROD AND LAMP.

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NEXT YOU WILL NEED TO A TRIGGER TRANSFORMER. GET A CANISTER IGNITION COIL AUTOTRANSFORMER FROM A JUNK YARD OR PEP BOYS.

OPEN THE CASE AND REMOVE THE COIL. THE CENTER COIL WILL BE A FINE WIRE, THIS IS THE SECONDARY COIL, THE PRIMARY COIL IS WRAPPED AROUND THE SECONDARY, THE PRIMARY IS A THICK WIRE...YOU NEED ADD A 50 OHM RESISTOR ON THE PRIMARY COIL. YOU MAY NEED TO TUNE THE TRANSFORMER AFTER THE CIRCUIT IS ASSEMBLED IF IT DOES NOT FLASH.

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THE FLASHLAMP POWER SUPPLY WE ARE GOING TO SHOW YOU IS SELF TRIGGERING, BUT WE WILL INCLUDE AN EXTERNAL TRIGGER CIRCUIT DESIGN USED BY MANUFACTURERS.

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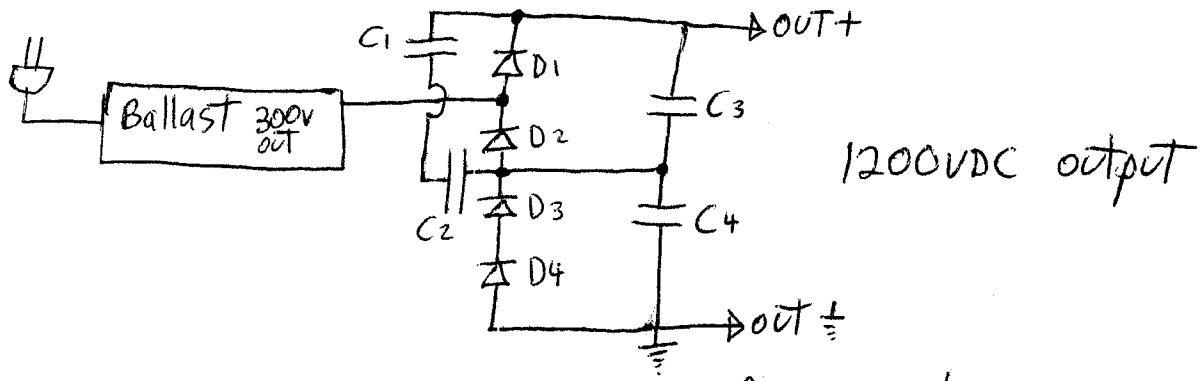
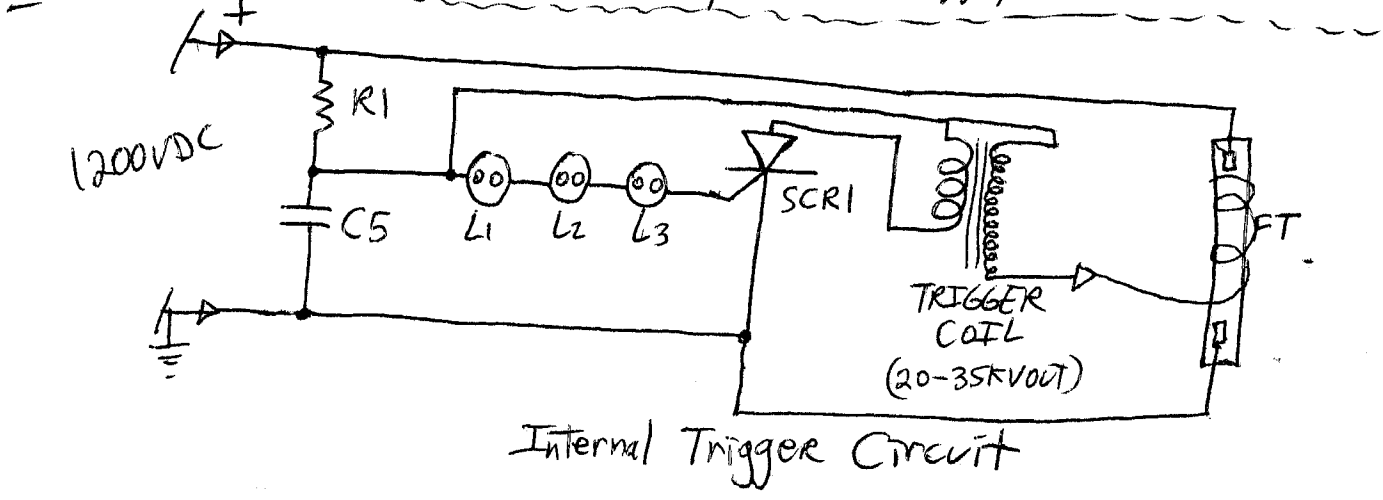
ACQUIRE THE FOLLOWING PARTS FOR CONSTRUCTION OF THE POWER SUPPLY.

R1=10-20MEG ½ WATT RESISTOR (QTY 1)
D1, D2, D3, D4=ANY 2000VDC 1AMP RECTIFIER DIODES (QTY 4)
C1, C2, C3, C4=2uF @ 1000-1200VDC
C5= .1uF @ 1000-1200VDC MYLAR CAP
L1, L2, L3=NEON BULBS

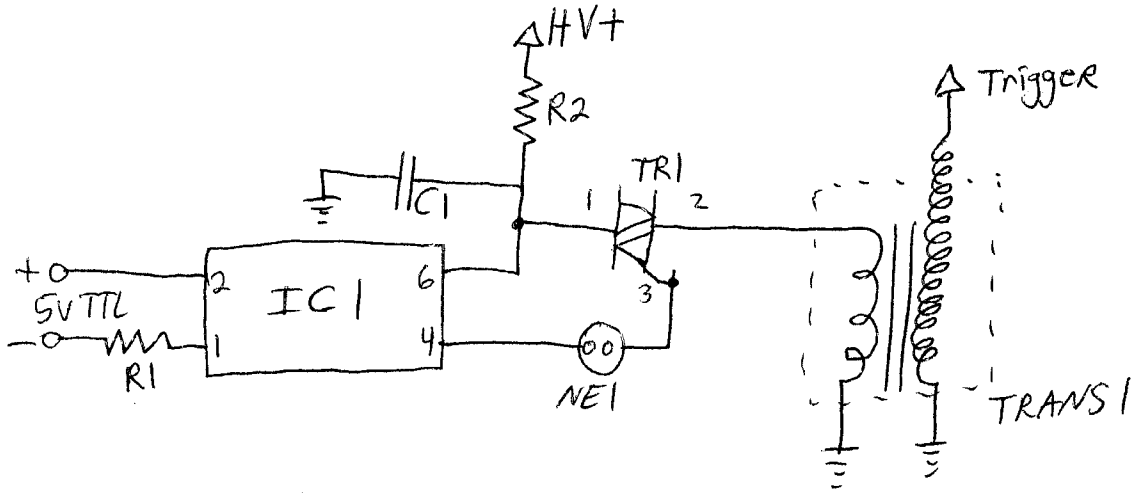
FT=3 INCH ACTIVE LENGTH ¼" FLASHLAMP
SCR1=HIGH VOLTAGE SCR RATED 1000-1200VDC AT 1AMP
BALLAST=110VAC TO 300VAC BALLAST TRANSFORMER @ 2AMPS MIN.




PARTS FOR EXTERNAL TRIGGER CIRCUIT.
IC1= MOC3010 OPTOISOLATOR
R1= 220OHM ¼ WATT RESISTOR
TR1= 2N6069 TRIAC
NE1=NEON BULB
C1=.047uF 1200V CAP
R2= 330K ½ WATT RESISTOR

THIS CIRCUIT REQUIRES A LOGIC LEVEL INPUT TO THE OPTOISOLATOR INPUT, THE PULSES FROM YOUR LOGIC CIRCUIT WILL CAUSE SYNCHRONOUS FLASHES. THE LOGIC LEVEL NEEDS TO BE AT LEAST 5VDC.




TRANS 1 = Auto Xfmr

DO NOT PLACE THE FLASHLAMP TOO CLOSE TO THE RUBY ROD OR IT WILL DESTROY IT. WHEN YOU PLACE THE MIRRORS AT EACH END, YOU MUST USE A HENE TO LINE THEM UP. THIS IS THE HARDEST PART OF GETTING THE RUBY LASER TO PROPERLY PUMP AND WORK. ALIGNING THE MIRRORS MUST BE DONE WITH A SPRING LOADED SCREW ADJUST X OR Y AXIS MIRROR MOUNT.

IF YOU WANT TO MAKE THIS DEVICE PORTABLE YOU MUST USE A 300WATT INVERTER CIRCUIT AND A VOLTAGE MULTIPLIER X9 USE A CASCADE MULTIPLIER OR USE A MINI TESLA COIL CIRCUIT RECTIFIED, BUT EITHER WAY YOU NEED AT LEAST 1200VDC FOR THE LAMP. MIN OF 75 JOULES.
YOU COULD EVEN USE A HENE POWER SUPPLY TO SUPPLY THE VOLTAGE TO CHARGE THE CAPS, BUT YOU WOULD NEED TO PLACE A CURRENT LIMITING RESISTOR IN LINE OF ABOUT 10-100K.

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FOR MORE INFO OR FOR PARTS YOU CAN EMAIL OUR MAIN SITE AT UUE@INFO-LABS.COM

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