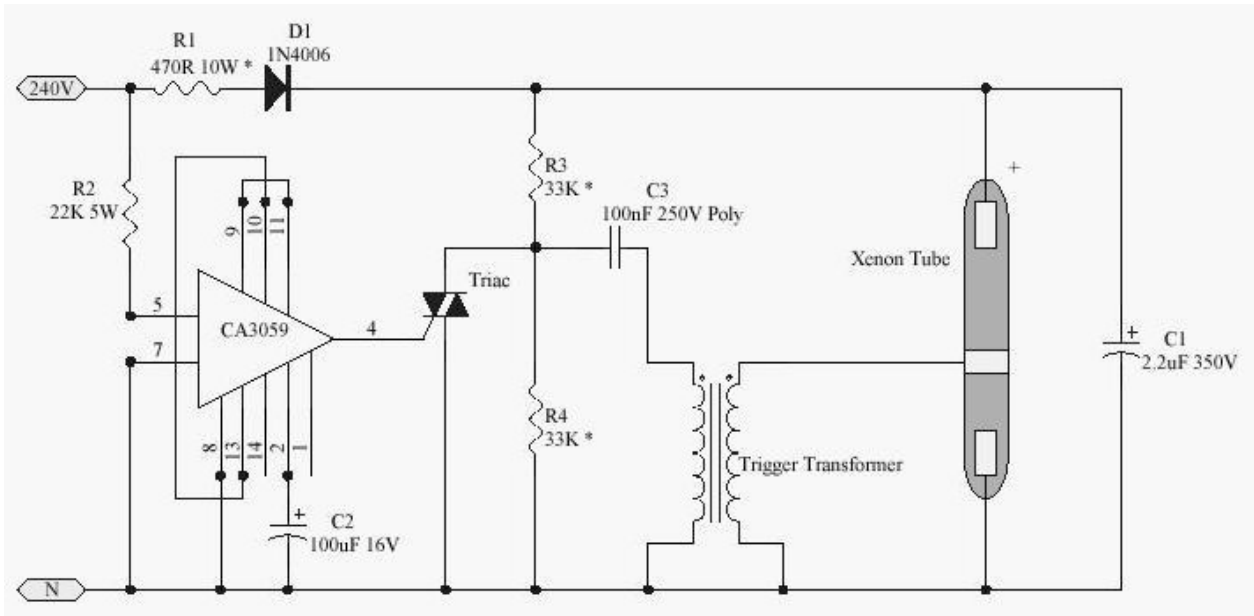


Zero Crossing Strobe

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This is a simple and inexpensive circuit for a strobe phase locked to the zero crossing of the mains supply. By illuminating the spark gap only at the electrical 0° point it allows one to quickly and accurately set the mechanical phase offset of the spark gap, rather than the long and tedious trial and error process of measuring spark length. I have given the current ordering information for most of the parts, others can be used, but may not fit the PCB.

Please note this circuit is optimised and tested for 240V mains. For 120V mains R2 should be substituted for a 10kΩ 3W component, 120V operation will also require the addition of a voltage doubler circuit, to provide a high enough DC voltage to fire the strobe.

R1 = 470Ω 10W

(Farnell code: 106-906)

R2 = 22kΩ 10W

(Farnell code: 106-920)

R3 = 33kΩ 1W

(Farnell code: 510-580)

R4 = 33kΩ 1W

(Farnell code: 510-580)

C1 = 2.2µF 350V Radial Electrolytic

(Farnell code: 660-309)

C2 = 100µF 16V Radial Electrolytic

(Farnell code: 301-7000)

C3 = 100nF 250V Polypropylene

(Farnell code: 148-888)

D1 = 1N4006

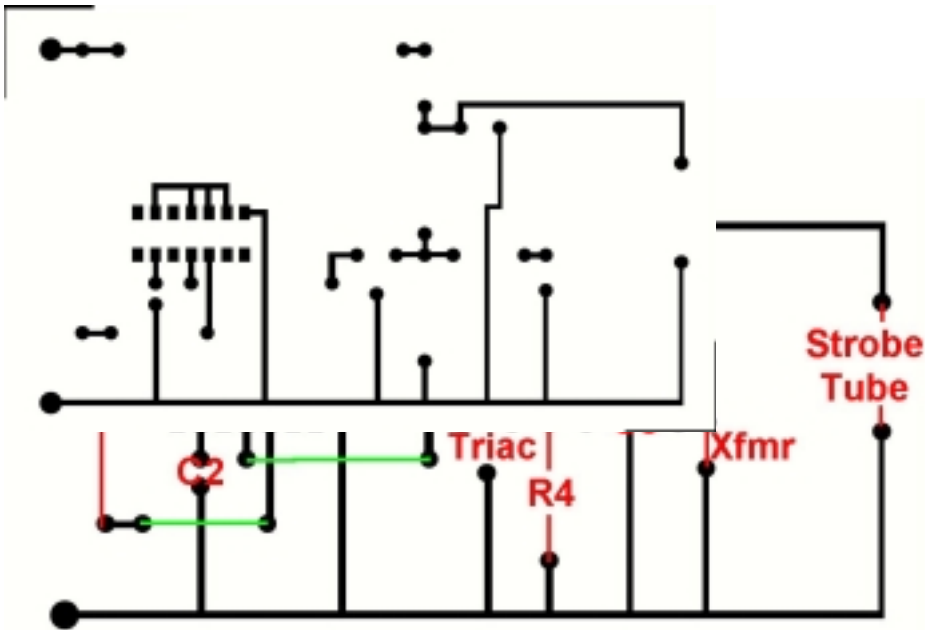
IC1 = CA3059 (nb. this chip is now discontinued, however I have about 20 in stock at the time of writing - nick@tcbouk.org.uk)

Triac = 600V 3A

Trigger Transformer = 4kV Axial Type (Maplin code: YQ63T)

Xenon Tube = 'U' type (Maplin code: FS78K)

The PCB layout below is for single sided positive photoresist board. Scale to 100mm by 60mm and print onto an OHP transparency, a laser printer gives best results.



This is the board layout. The link between the output terminal of the trigger transformer and the trigger (centre) electrode of the strobe tube should be made with heavily insulated HV wire, and care taken to keep it away from other components.

Green lines denote a jumper. The red lines are included for clarity only. A very low rated fuse (1A) should be fitted in the plug top, as this circuit has no internal protection.

Safe Coiling,
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