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http://wolfstone.halloweenhost.com/Flash/xsbfix_DebuggingStrobes.html

Debugging Strobes

Elsewhere on our web site, we discuss the theory and application of strobe lights. We also discuss the availability of commercial strobes and kits.

This page is dedicated to what can go wrong with a strobe light.

CAUTION

Xenon strobes use lethal voltage. Even a small battery-operated xenon strobe boosts the battery up to hundreds of volts in order to fire the flash tube. If you aren't prepared to know and follow high-voltage precautions, you shouldn't be poking around in a strobe!

In order to diagnose a problem, you may have to probe around in the guts of a strobe with the power on. This is very dangerous.

Before attempting a repair, make sure that the energy storage capacitors are discharged.

Also, never touch the xenon tube directly with your hands. The oils in your skin can damage it.

Preliminary Examination

Before you start screwing around with the gadget, take a moment to look it over closely.

- Is it physically damaged? Cracked case or busted xenon tube? Waterlogged?
- Is it plugged in and turned on?
- Does the pilot light come on?
- Is the fuse OK?

You Need A Schematic

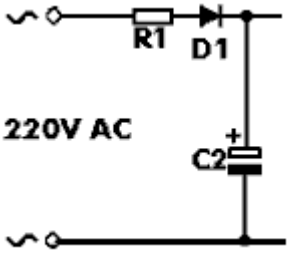
For any repair that is not utterly trivial, you will need a schematic diagram. If your gadget was built from an electronic kit, you should have the schematic, pictorial diagram, and maybe some trouble-shooting tips.

If you have thrown out the documentation, you might try contacting the kit manufacturer for replacement paperwork.

When all else fails, you can trace out the circuit yourself, reverse-engineering it.

High Voltage Problems

Measure the voltage across the xenon tube with power applied. It should probably be in excess of 220 Volts DC.

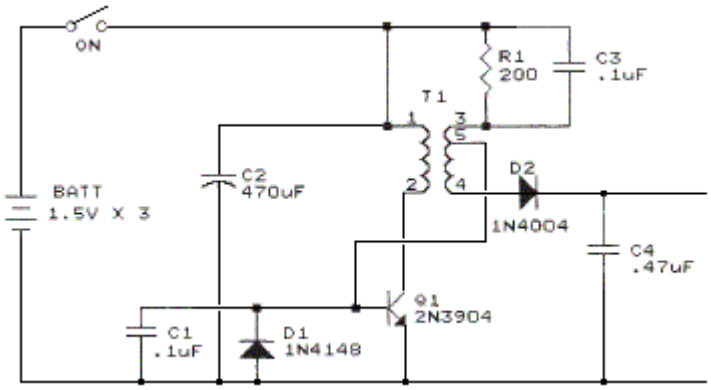


In Europe, the line voltage is sufficient to drive a xenon tube after rectification. This is a typical power supply for a line-powered strobe in 220 Volt countries.

In the U.S., some type of voltage-doubler is used, with the doubler capacitor(s) often serving double-duty as energy storage.

With the power off, check all diodes and make sure that they are operational.

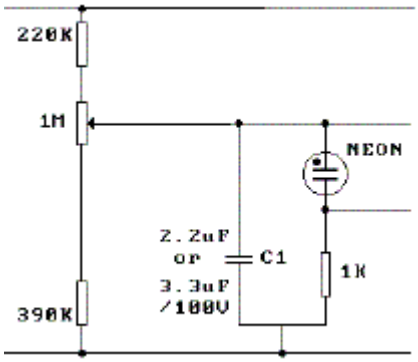
Check the capacitors. Note that strobe capacitors often need to "form" if they haven't been used recently. Perhaps the first few flashes will be weak, or it will take a minute to flash at all.



Battery-powered strobes are much more complex, due to the effort required to boost battery power up to a suitable operating voltage.

This circuit, shuffled around a little for clarity, looks a bit odd. I think that the 470 uFd and .47 uFd capacitors are swapped.

Timing Problems



Neon lamp relaxation oscillators are simple and cheap. No wonder they are commonly found in strobes.

This is a typical neon lamp relaxation oscillator.

The pot on the left sets the flash rate by controlling how fast the capacitor charges up. The faster the charge, the more frequent the flash.

- With the power on, see if the neon lamp is flashing on and off.
- If the neon is not flashing, either the neon or the resistor/capacitor circuit that feeds it is bad. With the power on, measure the voltage across the neon lamp. It should start off low and ramp up to about 90 VDC.
    - If it gets past 90 VDC and the neon doesn't flash, the neon lamp is bad.
    - If the voltage never builds up, the R/C circuit is bad.
- If the neon is flashing, then the problem is likely to be in the SCR or trigger transformer.