Circuit & Design Ideas

Interesting circuit ideas from readers and technical literature. While this material has been checked as far as possible for feasibility, the circuits have not been built and tested by us. As a consequence, we cannot accept responsibility, enter into correspondence or provide constructional details.

Audible indicators for panel lamps

The low current requirements and wide operating voltage range of continuous-tone piezoelectric alarms enable the production of transient sounds using passive RC networks.

The circuit of Fig. 1 produces a "ding" whenever the associated panel lamp turns on. The sound decays exponentially in volume as the capacitor charges to the full applied voltage.

When the lamp is turned off, the capacitor discharges via the diode and the lamp filament. If a low power diode is used, a small series resistor (10 to 1000Ω) may be used to limit the diode current if the lamp normally draws more than one amp. This circuit has been used as an automotive oil warning indicator and on custom built switchboards.

An interesting variation is shown in Fig. 2. Here the piezo alarm is used as a shop entry annunciator. It rings once each time the pressure mat is stepped on. A 9V transistor radio battery should power this circuit for at least six months.

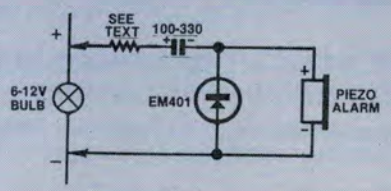

Fig. 1

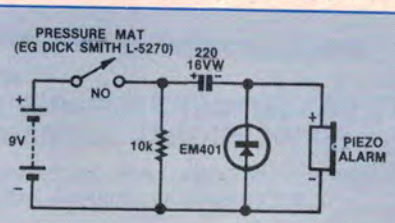

Fig. 2

Finally, the circuit of Fig. 3 uses a small bridge rectifier or four low cost diodes to produce a sound whenever the associated lamp goes on or off. Using a smaller capacitance gives a "dik-dik" sound which makes the circuit ideal as an audible blinker indicator for cars with "quiet" flasher units.

By using a non-polarised electrolytic or plastic dielectric capacitor, the circuit may be connected directly across the associated lamp without any need to check the polarity.

These circuits use so few components that construction can consist of gluing the diode(s) and capacitor(s) to the back of the piezo alarm. After wiring and testing the whole assembly can be potted in Araldite.

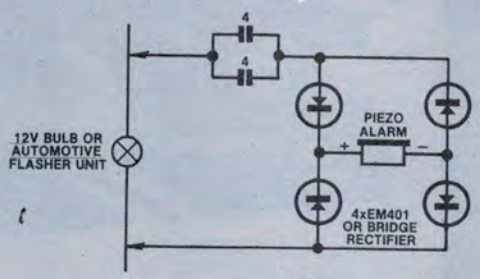

Fig. 3

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Extended response sound switch

Most sound switches respond immediately a sound is detected. This can be a problem in some applications. For example, if the circuit is to respond to a doorbell it may be triggered when a door is slammed or any other short loud noise occurs.

This circuit can be set to respond only to sounds of a specific duration, or longer. Short sounds will cause no response.

Part of the circuit of Cudlipp (featured in EA, February 1982) is used here (IC1). This functions as a microphone preamplifier and source of pulses which are delivered while ever a sound is present. IC2a is connected as a retriggerable monostable which provides a pulse of half to one-second duration when triggered by the output of IC1b.

IC3 is a comparator with a normally low output which goes high when the voltage at pin 2 exceeds ½Vcc. IC2b is connected as a non-retriggerable monostable which operates the relay via a BC548 when it is triggered by IC3's output.

When the circuit is first switched on, R1 and C1 will reset the monostables. When sound is detected, a series of negative-going pulses from the output of IC1b will trigger IC2a. Since IC2a is retriggerable, its output (pin 6) will remain high until the sound has ceased.

While the output of IC2a is high capacitor C2 will charge at a rate set by RV1. If the output of IC2a remains high for sufficient time, the voltage across C2 will exceed ½Vcc and so flip the comparator and thus trigger IC2b which will operate the relay for a time set by R3 and C3.

If C2 is not able to charge for long enough, it will merely discharge via the diode when the output of IC2a goes low and thus the relay cannot be turned on.

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