PROTECT YOUR ALARM by automatically silencing after a preset delay

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Alarms of various types are nowadays getting popular for use at homes, offices, industrial and commercial establishments and in automobiles. But after they start wailing few can silence automatically after a predetermined time.

Continuous sounding of an alarm for a long time, whether due to negligence or absence of the person who is supposed to switch it off, can damage the alarm. Most alarms are designed for a few minutes operation only. It is therefore advisable that a protective circuit may be used for automatically silencing an alarm after it has sounded off for a predetermined period. The circuit given here can switch off an alarm after a predetermined period of up to five minutes.

Working

When the alarm circuit is activated, the alarm voltage appears at the point 'y'. In the normal case, the alarm (loudspeaker, bell or horn etc) is connected at 'y' and operated directly. But now let us see the contribution of the additional protective circuit connected inbetween.

Initially, capacitor C1 is in a discharged condition and behaves as a short when the voltage appears at the point 'y'. Therefore, the base of transistor T1 gets the alarm circuit's full output voltage and is forward biased. When T1 conducts, it in turn drives T2 to conduction and saturation. Thus, the relay R and the alarm get supply as soon as the voltage appears at 'y' and operate normally, just as they would have without the intermediary protective circuit.

Now C1 starts charging through R1 and the voltage across R1 falls exponentially. After the delay, which is determined by the product of R1 and C1, this voltage falls so low that T1 can no longer conduct, and the alarm gets switched off. The circuit stays in this state until the alarm circuit is reset again for reuse.

Resistor R1 and diode D1 provide discharge paths for the capacitor C1, when the alarm is reset. Diode D2 provides reverse bias to transistor T2 so that there is no false switching due to small (transient) voltages.

Practical hints

1. Short points 'y' and 'z' as shown by dotted lines in the circuit diagram. Otherwise, short points 'x' and 'z' instead of 'y' and 'z'. In the latter arrangement, loading on the alarm circuit is reduced. In the former arrangement, the whole circuit can be viewed as an integral part of the alarm itself and does not need the third connection to the DC power supply.

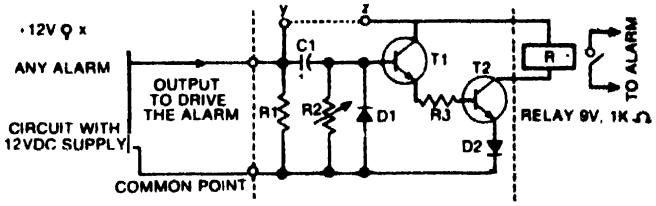

Fig 1: Alarm disabler after a preset delay

2. The circuit arrangement assumes that a relay is used in the alarm. In case it is desired to operate a horn or any other alarm which works directly on the same DC supply, the voltage at the collector output of T2 can be used to drive it through a suitable buffer stage.

3. The circuit is shown to work with +12V. It can be adapted for any other voltage.

4. If one needs a delay of more than five minutes, the value of capacitor C1 may be increased.

PARTS LIST

T1, T2—BC109C (BEL) transistors
D1, D2—CD32 (CDIL) diodes
C1—250μF, 12V electrolytic capacitor
R1, R3—4,700-ohm, 1/4W resistors
R2—500,000-ohm potentiometer (trimpot)

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