

Tail-biting one-shot keeps car-door light on

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A one-shot multivibrator that drives the same line it is sensing is useful for such applications as burglar alarms and switch-action delays because it can be fitted at any point in the circuit. Full reliability of the original circuit is retained, since connection of the one-shot across it does not break it. In the arrangement shown in the schematic, a 555 timer keeps the interior light of a car turned on for 10 seconds after the car doors are closed.

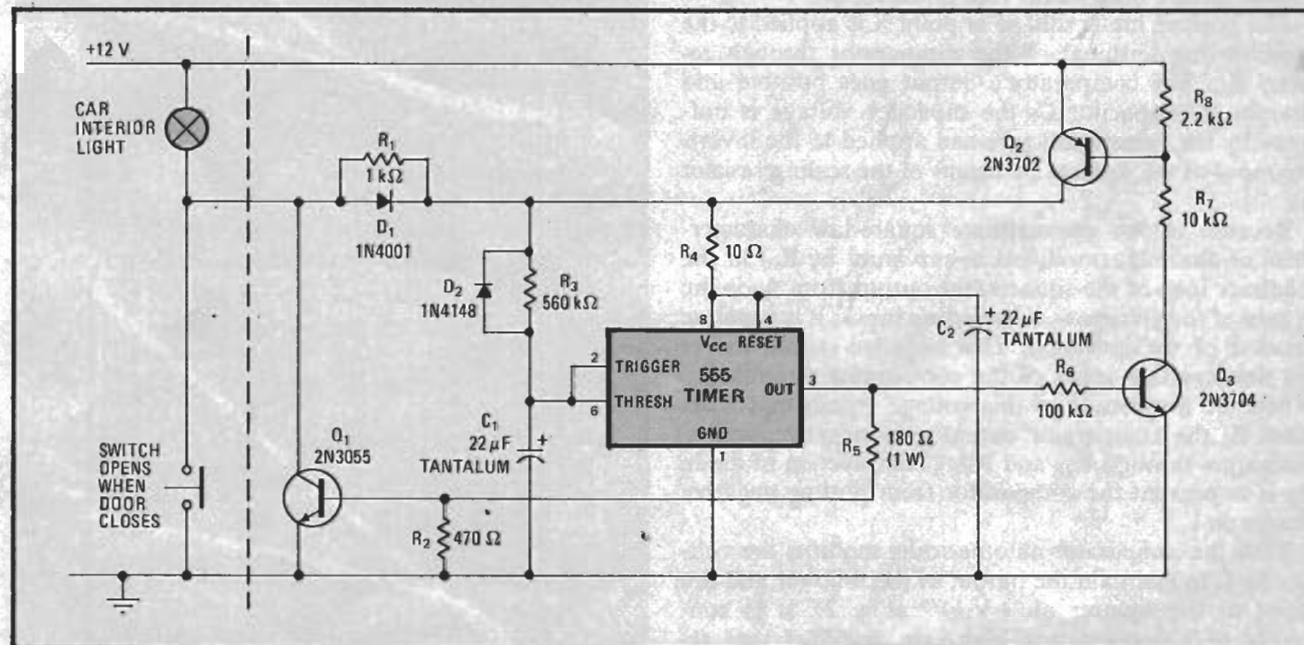
In the idle condition (door closed, light off), the 12-volt line charges capacitor C_1 and supplies power to the 555. The current drain is only about 10 milliamperes, so

the light does not go on. The threshold terminal of the 555 is held high by R_3 , so its output is low and all the rest of the circuit is off. When a door is opened, the light goes on in the usual way and the power to the one-shot is removed. Capacitor C_1 then discharges rapidly through D_2 and R_1 .

When the door is closed and the lamp starts to turn off, power flows to the 555. With C_1 discharged, the threshold terminal is at low voltage, so the output goes high. This turns on transistors Q_1 , Q_2 , and Q_3 . Q_2 maintains power to the 555 while Q_1 furnishes a path for current to flow to keep the light on. After a delay set by C_1 charging through R_3 , the 555 output goes low, restoring the circuit to its idle state.

The combination of C_2 and R_4 prevents transients on the battery supply from damaging the 555 or prematurely terminating the one-shot high output pulse. □

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Holds the light. When car door closes, output current pulse from 555 timer turns on transistor Q_1 to keep interior light on for about 10 seconds. This type of one-shot arrangement, driving the line that is sensed, can be added at any point in the circuit. It is useful in alarm systems, process controls, automatic machinery, safety circuits, and convenience circuits such as this one.