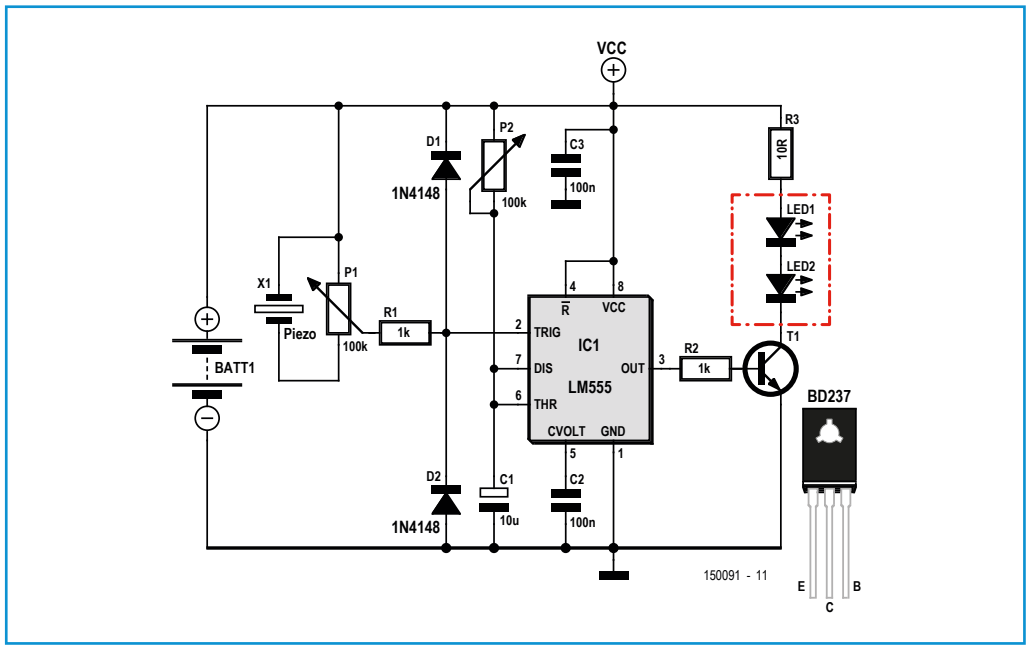
Carnival Drum Light

BOOM – FLASH - BOOM!

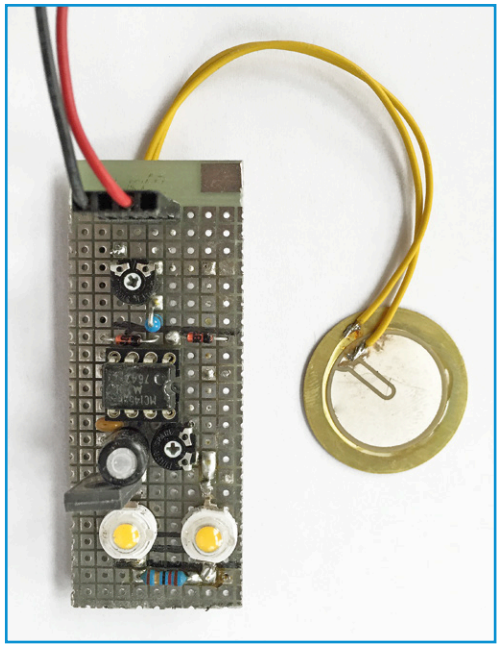
Some time ago the author was asked about options for making a Drum Light for the Carnival festivities. The contraption should light up brightly every time a drum is slammed, providing a nice light effect during late evening and night performances of the Carnival reveler banging the drum, whether solo or in a samba band.

By
Stefan Kalbermatter
(Switzerland)

The initial thought was to have a microphone followed by an amplifier and some kind of monostable multivibrator to make a couple of LEDs light. The idea got rejected because the microphone might catch too much ambient noise during Carnival and could eventually cause the LEDs to light constantly. It seemed another type of triggering device was needed to capture “the drum slam”.
A solution was found in a junked alarm clock with a broken case, obviously having crashed to the floor once too many. The built-in piezo buzzer seemed a good candidate for the triggering device. It was quickly dismantled and wired up to an oscilloscope and lo and behold, even gently rapping the piezo element produced nice peaks on the ‘scope. Seemed to work!
Based on this discovery a circuit was worked out on the premise of only dead common components being used — see the **schematic**. The electronic function is easy: via ‘sensitivity’



potentiometer P1, the piezo element (mounted directly on to the drum) is connected to an LM555 (IC1) which is configured as a monostable multivibrator (MMV). The output pulse of the LM555 can be adjusted by a second pot, P2, within a range of around 0 - 1.1 seconds. A medium-power transistor, T1, at the LM555's output drives the LEDs. The LEDs are modern high-power types salvaged from a GU-10 style LED lamp, of which the power supply had given up the ghost. Other types of LED may be suitable, but keep the current rating in check and adapt R3 to your LED type.



The circuit may be powered by four 1.5-V batteries in series, resulting in 6 V. However, since the LM555 can work from supply voltages between 4.5 and 16 V, any other battery or battery block in this voltage range can be used. Simply make sure to adapt LED current limiting resistor R3 to the LEDs used, and the supply voltage, otherwise the LEDs might flash just once.

Still on the power supply, for battery operation the LM555's 3 mA or so quiescent current might turn out too high eventually. In such situations, consider using the CMOS Type LMC555, which at a quiescent current of around 100 µA only and a wider V_{CC} range of 1.5 – 15 V, will enable the battery to last deep(er) into the night.

The circuit is so small and simple, our esteemed .POST newsletter readers should find it easy to build on a piece of stripboard or prototyping board. ⏮

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