

LONG-RANGE BURGLAR ALARM USING LASER TORCH

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Laser torch-based burglar alarms normally work in darkness only. But this long-range photoelectric alarm can work reliably in daytime also to warn you against intruders in

your big compounds, etc. The alarm comprises laser transmitter and receiver units, which are to be mounted on the opposite pillars of the entry gate. Whenever anyone enters to interrupt the transmitted laser beam falling on the receiver, the buzzer in the receiver

circuit sounds an alarm. The range of this burglar alarm is around 30 metres, which means you can place the transmitter and the receiver up to 30 metres apart. Since the laser torch can transmit light up to a distance of 500 metres, this range can be increased by orienting the phototransistor sensor properly. To avoid false triggering by sunlight, mount the phototransistor sensor such that it doesn't directly face sunlight.

The transmitter circuit is powered by 3V DC. The astable multivibrator built around timer 7555 (IC1) produces 5.25kHz frequency. CMOS version of timer 7555 is used for low-voltage operation. The body of the laser torch is connected to the emitter of npn transistor T1 and the spring-loaded lead protruding from inside the torch is connected to the ground.

The receiver circuit is powered by 12V DC. It uses photoDarlington 2N5777 (T2) to sense the laser beam transmitted from the laser torch. The output beam signals from photoDarlington are given to the two-stage amplifier followed by switching circuit, etc. As long as the laser beam falls on photoDarlington T2, relay RL1 remains un-energised and the buzzer does not sound. Also, LED1 doesn't glow.

When anyone interrupts the laser beam falling on photoDarlington T2, npn transistor T6 stops conducting and npn transistor T7 is driven into conduction. As a result, LED1 glows and relay RL1 energises to sound the buzzer for a few seconds (determined by the values of resistor R15 and capacitor C10). At the same time, the large indication load (230V AC alarm for louder sounds or any other device for momentary indication) also gets activated as it is connected to 230V AC mains via normally opened (N/O) contact of relay RL1. ●

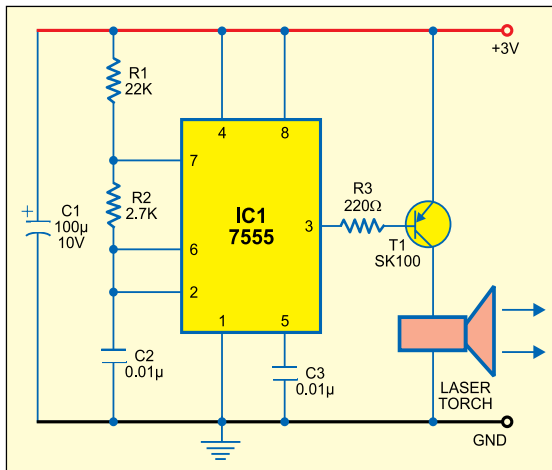


Fig. 1: Circuit of laser torch based transmitter

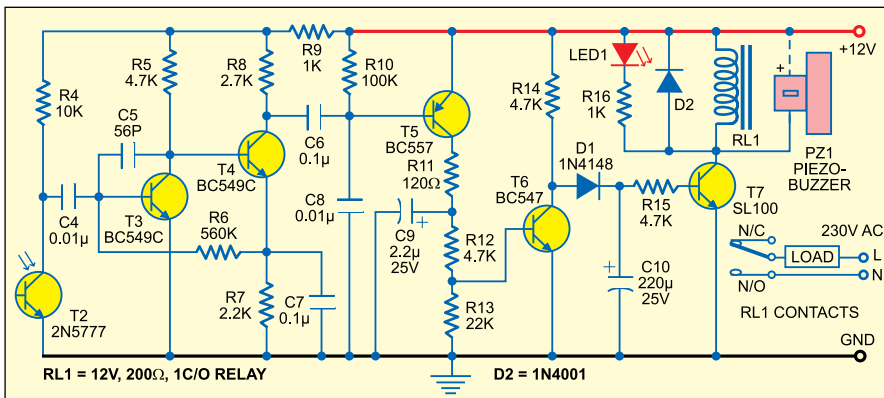


Fig. 2: Receiver circuit