AUTOMATED ALARM CIRCUITS

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Two alarm circuits are presented here. One produces bird-chirping sound and the other British police siren tone.

Fig. 1 shows the circuit of the bird-chirping-sound alarm unit along with the circuit of the control unit. Fig. 2 shows the circuit of only the British police siren tone generator, which has to be integrated with the control circuit portion of Fig. 1 at points A and B to complete the circuit diagram of automated alarm.

The control unit is built around ICs CD4047 and CD4027 (as shown on the left side of the dotted line in Fig. 1). As mentioned earlier, it is common to both the alarm circuits. IC CD4047 (IC1) is wired in positive-edge-triggering monostable multivibrator mode to set and reset IC CD4027 (IC2). The output pulse width of IC1 depends on the values of capacitor C2 and resistor R3 connected to its pins 1, 2 and 3.

Normally, when the door is closed, reed switch S1 is closed, transistor T1 conducts and the monostable multivibrator (IC1) remains in standby mode with 'low' output at pin 10.

When the door is opened, reed switch S1 gets disconnected, T1 stops conducting and low-to-high pulse at pin

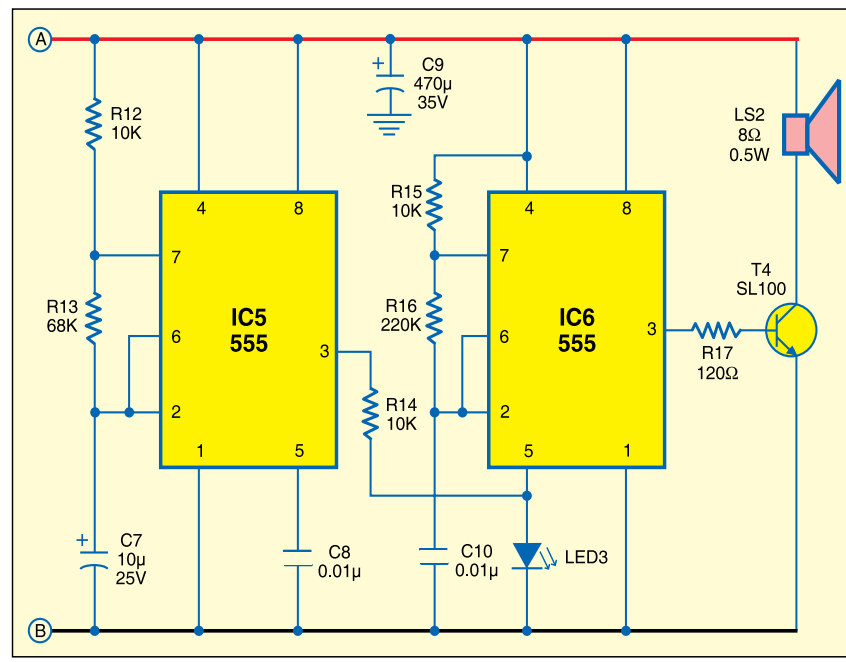

Fig. 2: Alarm circuit that generates police siren tone

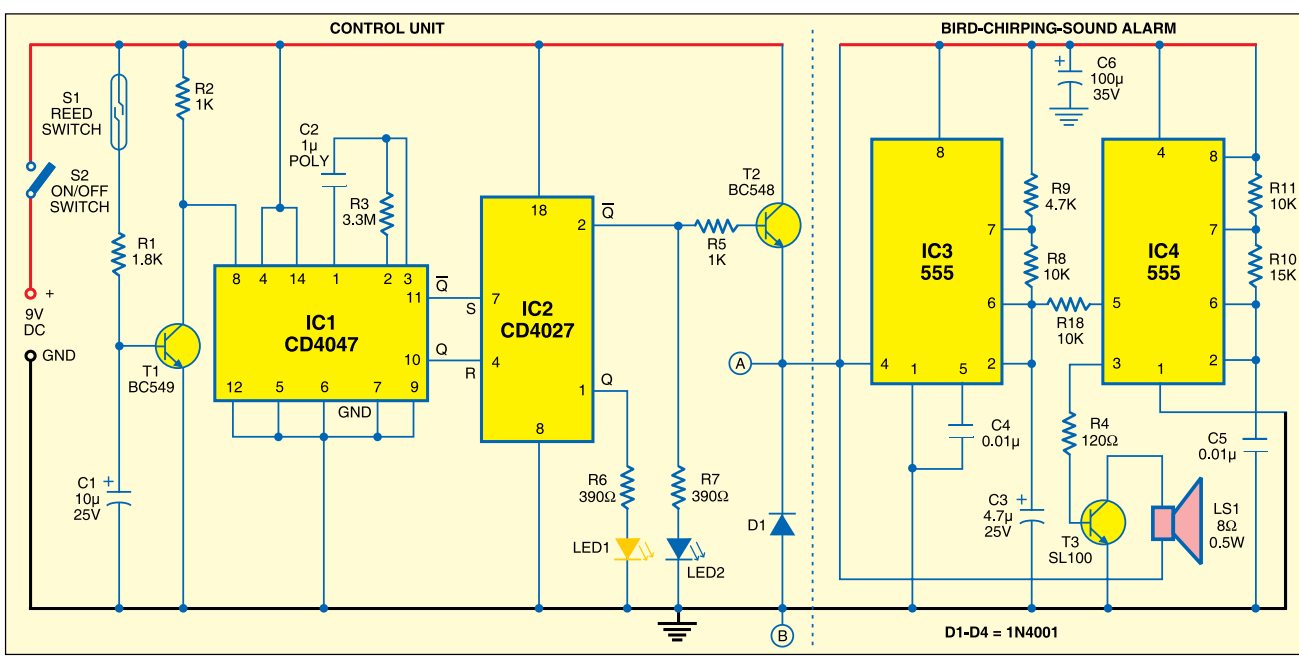

Fig. 1: Alarm circuit that generates bird-chirping sound

8 of IC1 triggers the monostable and a short-duration positive pulse of about 10 seconds is available as Q output at pin 10. At the same time, complementary output $\overline{Q}$ goes low at pin 11. The output from IC1 is used to set and reset IC2.

IC2 is a low-power, dual J-K master/slave flip-flop having independent J, K, set, reset and clock inputs. The flip-flops change states on the positive-going transition of the clock pulses. IC2 is wired such that its Q output turns 'high' when reset pin 4 receives a high pulse. When set pin 7 receives a high pulse, Q output goes low and $\overline{Q}$ output goes high. This lights up LED2 and drives transistor T2 (BC548), which enables the alarm circuit.

The output at point A is used to enable the alarm tone generator circuit (on the right side of the dotted line) consisting of two 555 timer ICs marked as IC3 and IC4. The R-C network determines the frequency of the sound produced. The triangular waveform of the astable multivibrator is taken out from the junction of pins 2 and 6 of IC3. This waveform is fed as the control voltage at pin 5 of IC4 through resistor R18. The output received from pin 3 of IC4 is fed to the base of transistor T3 to drive an 8-ohm loudspeaker (LS1), which generates the bird-chirping sound.

For the chirping-sound alarm generator, assemble the circuit shown in Fig. 1 on a separate general-purpose PCB and enclose in a small box. And if you want an alarm circuit with British police siren tone, assemble the circuit shown in Fig. 2 on another general-purpose PCB and connect it to points A and B of the control unit shown in Fig. 1 after removing the circuit on the right side of the dotted line. Use a 9V, 500mA standard adaptor to power the circuit.

This circuit may be used as a security alarm in banks, households and motorcars. ●