

# DTMF PROXIMITY DETECTOR

K.S. SANKAR



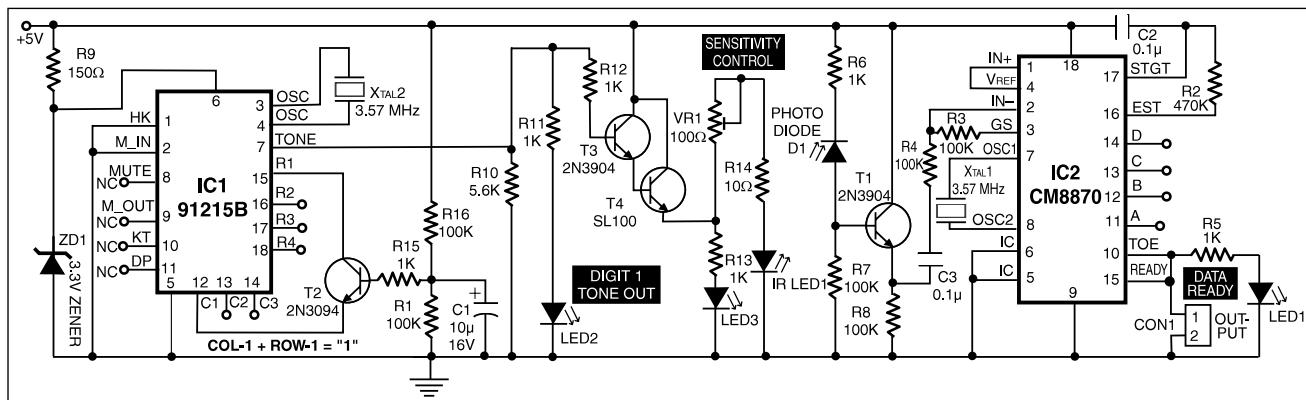
**A** DTMF-based IR transmitter and receiver pair can be used to realise a proximity detector. The circuit presented here enables you to detect any object capable of reflecting the IR beam and moving in front of the IR LED photodetector pair up to a distance of about 12 cm from it.

column 1 (pin 12) get connected together via transistor T2 after a power-on delay (determined by capacitor C1 and resistors R1 and R16 in the base circuit of the transistor) to generate DTMF tone (combination of 697 Hz and 1209 Hz) corresponding to keypad digit "1" continuously.

LED 2 is used to indicate the tone

from an object, falls on photodiode diode D1. (The photodiode is to be shielded from direct IR light transmission path of IR LED1 by using any opaque partition so that it receives only the reflected IR light.) On detection of the signal by photodiode, it is coupled to DTMF decoder IC2 through emitter-follower transistor T1.

When the valid tone pair is detected by the decoder, its StD pin 15 (shorted to TOE pin 10) goes 'high'. The detection of



The circuit uses the commonly available telephony ICs such as dial-tone generator 91214B/91215B (IC1) and DTMF decoder CM8870 (IC2) in conjunction with infrared LED (IR LED1), photodiode D1, and other components as shown in the figure. A properly regulated 5V DC power supply is required for operation of the circuit.

The transmitter part is configured around dialer IC1. Its row 1 (pin 15) and

output from IC3. This tone output is amplified by Darlington transistor pair of T3 and T4 to drive IR LED1 via variable resistor VR1 in series with fixed 10-ohm resistor R14. Thus IR LED1 produces tone-modulated IR light. Variable resistor VR1 controls the emission level to vary the transmission range. LED 3 indicates that transmission is taking place.

A part of modulated IR light signal transmitted by IR LED1, after reflection

the object in proximity of IR transmitter-receiver combination is indicated by LED1. The active-high logic output pulse (terminated at connector CON1, in the figure) can be used to switch on/off any device (such as a siren via a latch and relay driver) or it can be used to clock a counter, etc.

This DTMF proximity detector finds applications in burglar alarms, object counter and tachometers, etc. □