

Wire Tracer (Transmitter)

038

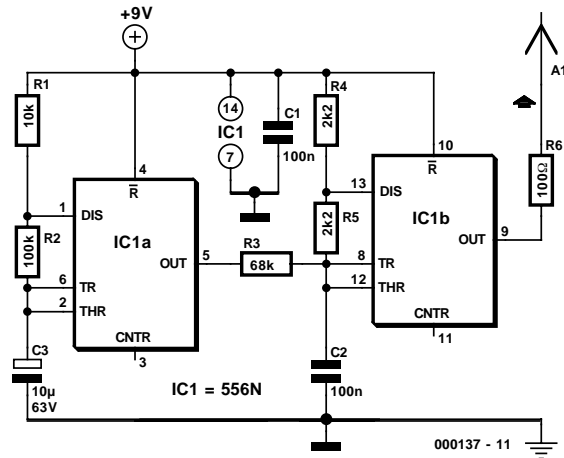
E. de Leeuw

The circuit depicted here forms one half of a device that will prove extremely handy when tracing the path of electrical wiring in a building or to locate a break in a wire. The system is based on similar equipment that is used by technicians in telephone exchanges.

The operation is straightforward. You require a generator that delivers an easily recognisable signal which, using a short antenna, is inductively coupled to a simple, but high gain, receiver.

To create a useful transmitter it would suffice to build a simple generator based on a 555. But as the adjacent diagram shows, a 556 was selected instead. The second timer (IC1a) is used to modulate the tone produced by IC1b. The output frequency alternates between about 2100 Hz and 2200 Hz. This is a very distinctive test signal that is easily distinguished from any other signals that may be present. Resistor R6 is connected to a piece of wire, about ten centimetres long, that functions as the antenna. The ground connection (junction C2-C3) is connected to ground.

When the antenna is connected directly to a cable, it is possible to determine at the other end of the cable, with the



aid of the receiver, which conductor is which (don't do this with live conductors!).

The schematic for the matching receiver may be found elsewhere in this issue.

Wire Tracer (Receiver)

039

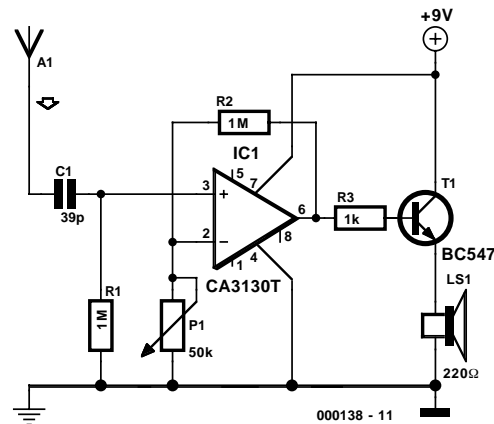
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The circuit depicted is the receiver device of a transmitter/receiver combination that will prove extremely handy when tracing the path of electrical wiring in a building or to locate a break in a wire.

The corresponding transmitter may be found elsewhere in this issue. The transmitter produces a distinctive tone which alternates between 2100 Hz and 2200 Hz.

The matching receiver for the wire tracer is possibly even simpler than the transmitter, as is shown by the schematic. It consists of no more than a short wire antenna (a piece of wire, 10 cm long is adequate), a high-pass filter (C1-R1), an amplifier stage (IC1), an output stage (T1) and a loudspeaker. The prototype used a high impedance loudspeaker from a telephone handset, and this worked remarkably well.

The purpose of P1 is to adjust the amplification. At the highest amplification, the wire energised by the transmitter can be traced from several tens of centimetres away. A



direct electrical connection is therefore not required. However, it is important that you hold the ground connection (earth) in your hand.

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