

# REMOTE CONTROL TESTER

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INFRARED REMOTE CONTROLS ARE very common these days, thanks to all the video, audio, and VCR equipment on the market that can be controlled with an infrared remote. Remote controls are great when they work properly. However, it's very frustrating when you press a button on the remote control and nothing happens. If you've ever had that problem, then you know what we mean when we say it's frustrating.

It's always hard to know

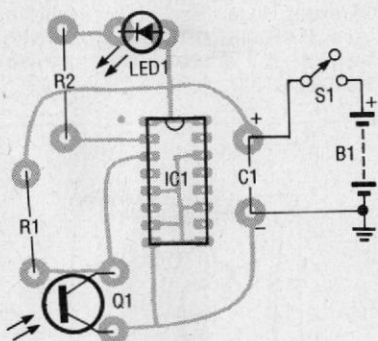


FIG. 2—PARTS-PLACEMENT diagram for the IR tester. Point-to-point wiring can also be used.

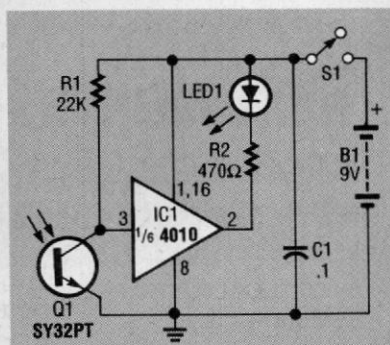
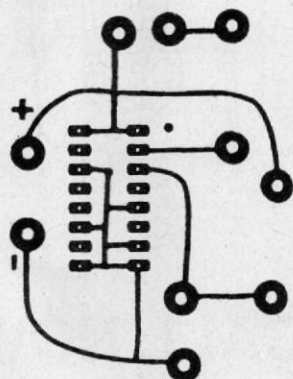


FIG. 1—THE IR TESTER circuit lets you know if the button you press on a remote control is working.

## PARTS LIST

- R1—22,000 ohms, 1/4-watt, 5%
- R2—470 ohms, 1/4-watt, 5%
- C1—0.1  $\mu$ F, ceramic
- IC1—4010 CMOS hex non-inverting buffer
- LED—light-emitting diode, any color
- Q1—SY32PT IR phototransistor or equivalent
- B1—9-volt battery
- Project case, PC board or perforated construction board, battery clip, wire, solder, etc.



1 3/4 INCHES

FOIL PATTERN for the IR tester circuit.

whether a malfunction is due to the remote control or the device you are trying to control. After all, infrared (IR) is invisible to the human eye, so how do you know if the control is working?

The answer is simple: Build our IR remote-control tester. It will let you know if, when you press the button, the control is emitting an IR signal.

The IR tester circuit is shown in Fig. 1. IR phototransistor Q1 receives the signal from a re-

mote control and sends it to one gate of a CMOS 4014 non-inverting hex buffer. The output from the buffer drives an LED that flashes the received signal to let you know that the remote control (or at least the one button you pressed) is working and emitting an IR signal.

We've provided a foil pattern to make a PC board for this project, but the circuit can easily be made using point-to-point wiring. Figure 2 shows the parts-placement for the PC board, should you decide to use it. The completed circuit can be installed in any suitable case. Mount the IR phototransistor where it can easily receive the IR signal, and mount the LED where it's easy to see. A 9-volt battery powers the circuit, but you can certainly build an AC-powered supply if you wish.

Once constructed, the tester will determine if your remote control is causing the problem. Simply point the remote control at the IR phototransistor, and press each button. The LED will flash for proper operation.  $\Omega$

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