Low-cost tester checks DIP switches

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Detecting all the possible failure mechanisms in dual-in-line package (DIP) switches of the multiple single-pole, single-throw and the double-pole, single-throw variety, this circuit is simple and inexpensive and will therefore be invaluable for production-line testing. The basic circuit is useful for uncovering defects in 16-pin switches: it is easily expanded so that 8- and 14-pin switches can be checked.

The basic DIP assembly can exhibit three types of failure mechanisms—two adjacent switches can be shorted together, a switch in the closed position may not be touching its respective terminal, or a switch in the open position may be touching its respective terminal. The switch tester shown in (a) can test for the first two failure mechanisms simultaneously in 16-pin devices as well as detect complex combinations of the two.

To initiate the test, the DIP assembly is inserted into the socket with all of the switches in the closed position. Because the tester daisy-chains all of the switches, the light-emitting diode will be illuminated if each switch is making proper contact with its respective terminal and if there are no shorts between adjacent terminals. Any fault encountered will keep the LED off.

To test the third failure mechanism, when a switch in the open position is still making contact with its terminal, the technician must open and close each of the switches within the assembly. Initially, the LED will be on; however, it must go off and on each time each switch is opened and closed, or the assembly is faulty.

The arrangement in (b) will accommodate all popular switch sizes. That includes the 8-, 14-, and 16-pin single-pole, single-throw switch types, as well as the 8- and 16-pin dip switches of the double-pole, single-throw variety, which have virtually the same electrical configuration as their spst counterparts.

The circuit will operate from a 9-volt transistor battery and thus is suitable for portable use. Maximum current drain is approximately 15 milliamperes. □

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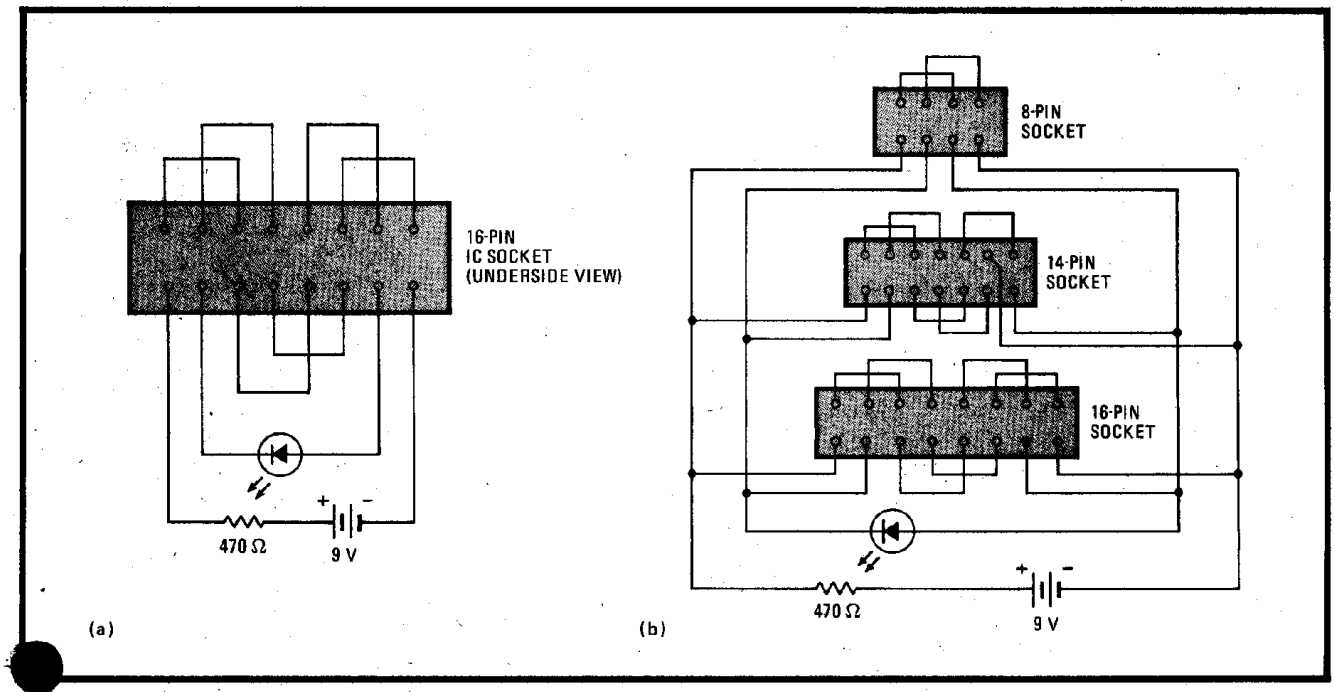

Line test. Circuit daisy-chains multiple spst or dpst switch contacts of 16-pin DIP assembly in order to check for all types of open circuits and shorts (a). Illuminated LED indicates good assembly. Circuit is easily expanded to handle the popular 8- and 14-pin types (b).