

## Go/no-go tester checks out 16-wire ribbon cable fast

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Checking multiwire ribbon cable for open and shorted wires is tedious when done lead by lead with an ohmmeter. This tester instead provides a quick go/no-go check of the entire cable assembly, using an indicator made of light-emitting diodes. The cable is just plugged into the tester, which in principle can test any number of lines but in the diagram has been wired for a 16-lead cable.

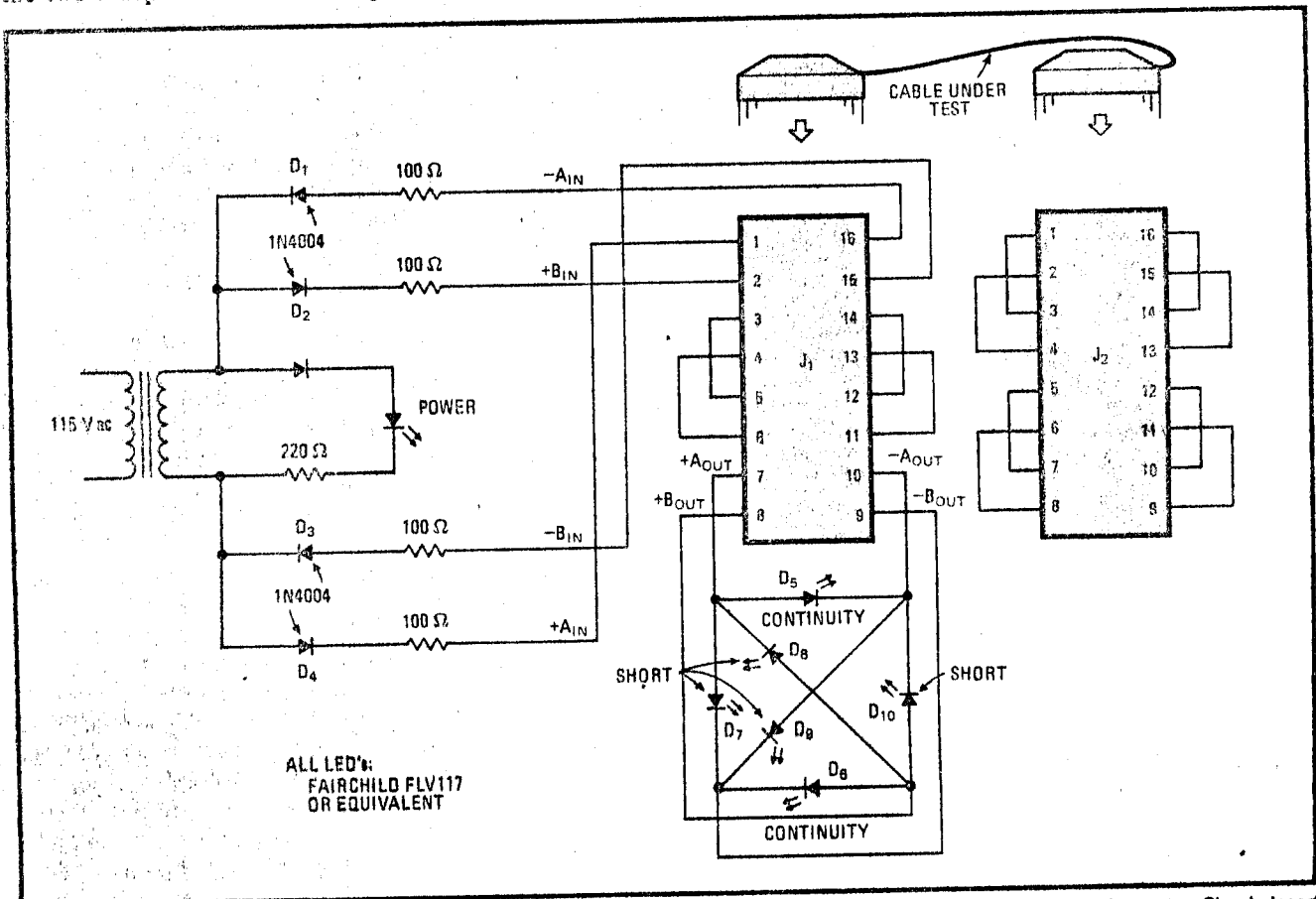
As shown in the figure, the voltage output from the 6.3-volt filament transformer is rectified on either side of the secondary winding by diodes  $D_1$  through  $D_4$ , producing the four voltages  $+A_{in}$ ,  $-A_{in}$ ,  $+B_{in}$ , and  $-B_{in}$ . The generation of two pairs of identical voltages on both sides of the winding is necessary in order to form the two independent current loops needed for checking

all 16 lines of the cable without difficulty.

The four output voltages are presented to pins 1, 2, 15, and 16 of socket  $J_1$ , a 16-pin dual in-line package.  $J_1$  and  $J_2$ , which are identical, must be wired such that none of the four input voltages is adjacent to itself; otherwise, the independent current loops are difficult to construct.

Located at the other end of  $J_1$ , driving the LED bridge, are signals  $+A_{out}$ ,  $+B_{out}$ ,  $-A_{out}$ , and  $-B_{out}$ , corresponding to the A and B voltages at the connector input. If all the wires in the cable have continuity and no shorts, only diodes  $D_5$  and  $D_6$  will light. This can easily be seen if the initial input voltages are traced from their entry to  $J_1$ , through the cable to  $J_2$ , back to  $J_1$  at a different pin, and so on, until the voltage appears at the  $\pm A$  and  $\pm B$  output ports. Since the A and B voltages are out of phase by  $180^\circ$  at all times, the current lights  $D_5$  and  $D_6$  alternately at a 60-hertz rate.

If there is a lack of continuity, one or both of the current loops will open, extinguishing either or both of these diodes. A short between any two wires in the cable will create alternating current paths from one current loop to another, lighting one or more of the diodes  $D_7$  through  $D_{10}$ . □



**Single test.** Each lead of a 16-wire ribbon cable can be quickly checked for continuity and shorts without using an ohmmeter. Simply insert ribbon cable into DIP sockets  $J_1$  and  $J_2$ . LEDs  $D_5$  through  $D_{10}$  immediately indicate condition of cable.