

# Diodes Isolate Two Power Supply Outputs

Simple techniques let you use a few ordinary silicon diodes to isolate two outputs of a single power supply

You often need two independent dc supplies when only one ac winding or source is available. You can have two by using the redundant diodes (D2 and

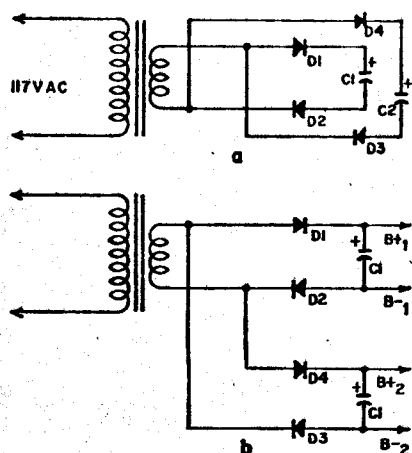


Fig. 1

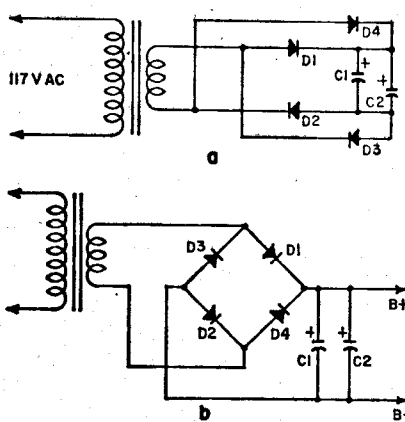


Fig. 2

D3) which are used for isolation (see Fig. 1-a). (Fig. 1-b shows the circuit redrawn as it would appear in an equipment diagram.)

A diode is in each lead of the filter capacitor even though only one is needed for rectification. The two supplies work on opposite halves of the ac cycle. While diodes D1 and D2 are forward-biased and rectifying, D3 and D4 are back-biased and isolating C2 from the ac winding and from C1.

The two supplies are independent and can be connected in series, parallel (Fig. 2-a) or used in separate parts of the same circuitry. If they are paralleled the circuit is the familiar full-wave bridge rectifier (Fig. 2-b) with the two capacitors in parallel.

When the supplies are in series as in Fig. 3-a, the negative of C1 is connected to the positive of C2 (or vice versa). They now form a full-wave voltage doubler (Fig. 3-b). Diodes D2 and D4 are now redundant. They are paralleled back to back and serve no useful

(continued on page 100)

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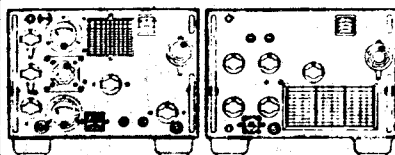
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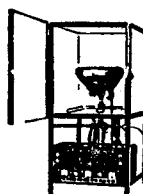
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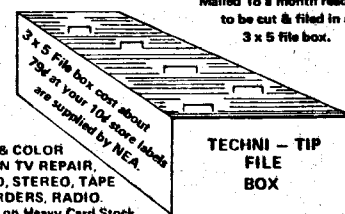
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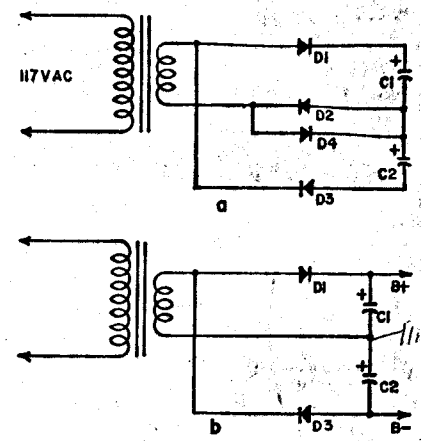


Fig. 3

disturbance on the regulation of the other since the transformer is used alternately by them. The degree of isolation depends on diode back resistance.

The supplies must be fed from an isolated source. The ac line cannot be used because one side is grounded.—William R. Laitinen R-E



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