MAKE YOUR VTVM A MEGGER TOO

MEASURE UP TO 50,000 MEGOHMS

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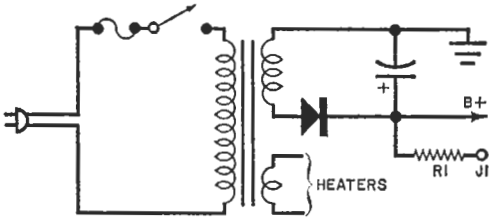
BUILT RIGHT into your VTVM is a megger that can measure extremely high resistances (to 50,000 megohms). To make use of this megger function, all you have to do to the basic meter is add a resistor and a pin or banana jack. The modification simply provides a convenient voltage source for measuring very high resistances; it does not interfere with the normal operation of your meter.

The megger modification comes in handy for all sorts of jobs. It greatly simplifies the detection of leakage in non-electrolytic capacitors, between coil and transformer windings, and between conductors of transmission lines.

The filtered d.c. for the megger is obtained from the positive side of the filter capacitor, through load resistor *R1* which is also used as a current limiter, in your VTVM as shown in the schematic diagram. Load resistor *R1* is the megger modification resistor that must be added to the VTVM's circuit. Its value must be calculated on the basis that it will pass no more than 1 mA if the ground lead of the meter is accidentally shorted to *J1* (the pin or banana jack that is used in the modification). This value is usually between 50,000 and 75,000 ohms, depending on the amplitude of the B+ voltage in your particular meter and derived by Ohm's Law ($R1 = B+/0.001$).



Two small parts, R1 and J1, are all that have to be added to basic VTVM to provide megger function.

The first step in measuring an unknown resistance is to measure the source voltage at *J1* with the positive d.c. probe of the meter. Then unknown resistor *Rx* is placed between *J1* and the probe to provide a circuit from B+ through *Rx* and into the input of the meter. At this point, the meter is measuring the voltage drop across input impedance *Rm* of the meter, which is typically 11 megohms.

If *Rm* and its voltage drop *Em* are known, you can calculate total current *It*. The voltage drop across *Rx* can be calculated by subtracting meter voltage *Em* from source voltage *Es* to obtain *Ex*, the voltage dropped across the resistance being measured.

With total current through and the voltage drop across *Rx* known, calculate the value of *Rx* by using Ohm's Law ($Rx = Ex/Ix$), or from the equation: $Rx = [Rm\ (Es - Em)]/Em$.

Most VTVM's have unregulated power supplies, but since the resistances being measured are very high, the loading effect on the power supplies will be negligible. Also, since current through *Rx* is very low, the voltage drop across the current-limiting resistor, *R1*, can be ignored —30—