Connect the special voltmeter leads to the 150-volt scale of the voltmeter, and the special ammeter leads to the 1.5-amp scale of the ammeter. Connect 120 VDC to the terminals of the circuit.

Series Circuit: With the variable resistance set at near maximum resistance, observe successively the potential drops across the variable resistor, across the 100-watt lamp, and across the entire circuit. Point out the relationship among the three potential drops. (See Note.) By plugging the ammeter into first one and then another of the three jacks, observe that the current is the same everywhere. Decrease the resistance to about 1/3 of its maximum value and repeat if desired.

Parallel-Series Combination: Observe successively the potential drops across each of the two lamps in parallel (a 25-watt and a 60-watt), across the parallel combination, across the 100-watt lamp in series, and across the entire circuit. Point out the relationship among the several potential drops. (See Note.) By plugging the ammeter into first one and then another of the five jacks, observe the relationship among the several currents.

Note: The 150-volt scale of the voltmeter is accurate everywhere within 2% of full-scale reading. The error below 120 volts never exceeds 2 volts, and is usually much less. Nevertheless, due to non-linearity, voltmeter inaccuracy can introduce a discrepancy as much as 3.6 volts between the sum of the partial potentials and the entire potential. Nearly all of this error can be eliminated if you wish to use the calibration posted on the back of the meter. The meter has a resistance of about 107 ohms/volt. Connecting it across a portion of the series circuit never changes the potential by more than 0.3 volt, thus introducing a maximum error of 0.6 volt. If no meter corrections are applied, the overall error in the experiment may be as large as about 4.2 volts, or 3.5%. If the calibration chart is used, the overall error should not exceed about 1 volt, or less than 1%.