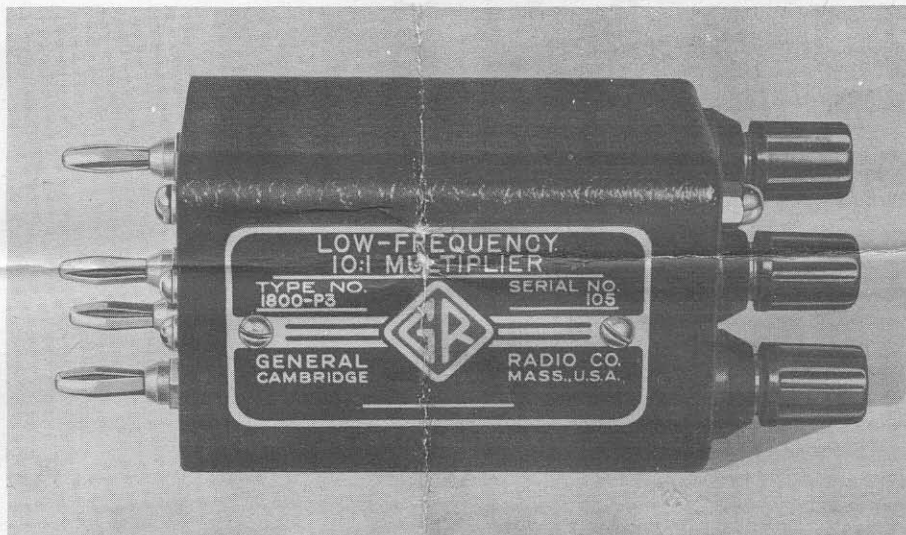


TYPE 1800-P3 LOW-FREQUENCY MULTIPLIER



This multiplier extends the range of the Type 1800-A Vacuum-Tube Voltmeter to 1500 volts for both d-c and low-frequency a-c measurements. The multiplier plugs into the binding posts on the voltmeter panel. For d-c measurements a fixed resistance voltage divider is used giving a 10:1 reduction in the voltage applied to the voltmeter. For a-c use the multiplier consists of a capacitance-resistance voltage divider.

The Type 1800-P3 Low-Frequency Multiplier is not recommended for use above 100 kilocycles unless adjusted for use at a fixed frequency. For frequencies above 100 kilocycles, the Type 1800-P2 Multiplier is recommended.

SPECIFICATIONS

Multiplier Ratio: DC, 10:1 $\pm 1.5\%$ for all Type 1800-A Voltmeters. AC, 10:1 $\pm 0.5\%$ when the multiplier is adjusted to the voltmeter with which it is to be used. A multiplier ordered with a Type 1800-A Voltmeter is adjusted at the factory to that voltmeter. When the multiplier is used with another voltmeter there is a possible additional error of $\pm 5\%$ but the multiplier can be adjusted to any Type 1800-A Voltmeter by the user.

Input Impedance: DC, 10 megohms. AC, 10 megohms parallel resistance, with 10 μmf parallel capacitance.

Frequency Error: 20 to 20,000 c, $\pm 3\%$
20 kc to 100 kc, $\pm 5\%$

Waveform Error: As with the Type 1800-A Voltmeter, the deviation from r-m-s reading may be as large as the percentage of harmonics present on the signal; but the error will not necessarily be the same as that of the voltmeter when used without the multiplier, because of the different impedance presented to the voltmeter by the multiplier.

Dimensions: (Length) 5 x 2 x 2 inches, overall.

Net Weight: 8 ounces.

CONNECTION TO VOLTMETER

A-C Voltage Measurement: The engraving on the multiplier indicates the manner of connecting it to the voltmeter. The voltmeter A-C LOW binding post may be either grounded or ungrounded.

D-C VOLTAGE MEASUREMENT

Positive Polarity Grounded: The engraving on the multiplier indicates the manner of connecting it to the voltmeter. The voltmeter binding posts should be arranged so that the D-C 10 Megohm input is shorted. The A-C LOW binding post may be either grounded or ungrounded.

Negative Polarity Grounded: The multiplier may be connected in accordance with the engraving if the maximum voltage to be measured is 500 volts. The voltmeter A-C LOW binding post should not be grounded.

If a voltage greater than 500 volts is to be measured, the multiplier should be connected as follows. Rotate the multiplier so that the G plug terminal is at the top. Plug the multiplier OPEN GRID terminals into the voltmeter OPEN GRID binding posts (the multiplier G plug will not be engaged but can be connected to the lower D-C binding post with a clip lead) disregarding the polarity engraving. The sense of the polarity engraving at the multiplier input binding posts will be reversed. The voltmeter A-C LOW binding post should not be grounded.

ADJUSTMENT: Two adjustments for the a-c multiplier are provided under the nameplate. **CAUTION:** The adjusting controls are connected to the high voltage terminal. It is desirable when making the adjustments to have a stable source of voltage with a harmonic distortion of less than 1% and an output of at least 100 volts. Adjustments can then be made using the same scale points on the linear 15-volt and 150-volt scales of the Type 1800-A Voltmeter. Using these scales reduces to less than +1% the adjustment error attributable to the voltmeter calibration. Similarly the waveform error will be less than +1% if a source as specified is used.

The first adjustment is made at a frequency of 1500 cycles or lower with the rheostat marked "1500 c" to give a 10:1 multiplier ratio.

The second adjustment is made at 15 kilocycles (or at any frequency from 1500 cycles to 5 megacycles if the multiplier error is to be removed from measurements at any particular frequency in that range) with the capacitor marked "15 kc" to give a 10:1 multiplier ratio.

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