



tion between capacitance deviation and distance deviation, a curve is added to show the equivalent effect of eccentricity. As the curve shows, one can center the rod in the jig by adjusting the rod for minimum capacitance.

For the high precision required, it is necessary to eliminate the effects of the leads from the bridge to the unknown. Thus the jig is connected as a three-terminal capacitor, and is measured as such by the TYPE 1615-A Bridge.

The absolute accuracy of this measurement depends on the accuracy of the standard rod. Rods with tolerances as

small as  $\pm 10$  microinches are commercially available. The sensitivity of capacitance to changes in distance is inversely proportional to the spacing between rod and jig. Decreasing this spacing will add leverage to the relation, in the direction of increased precision. As the spacing is reduced, however, the linearity of the capacitance-distance relation is sacrificed. The optimum spacing therefore represents a compromise between sensitivity and linearity.

— A. E. SANDERSON

— F. VAN VEEN

## NEW, MEGOHM, WIRE-WOUND RESISTORS AND DECADES

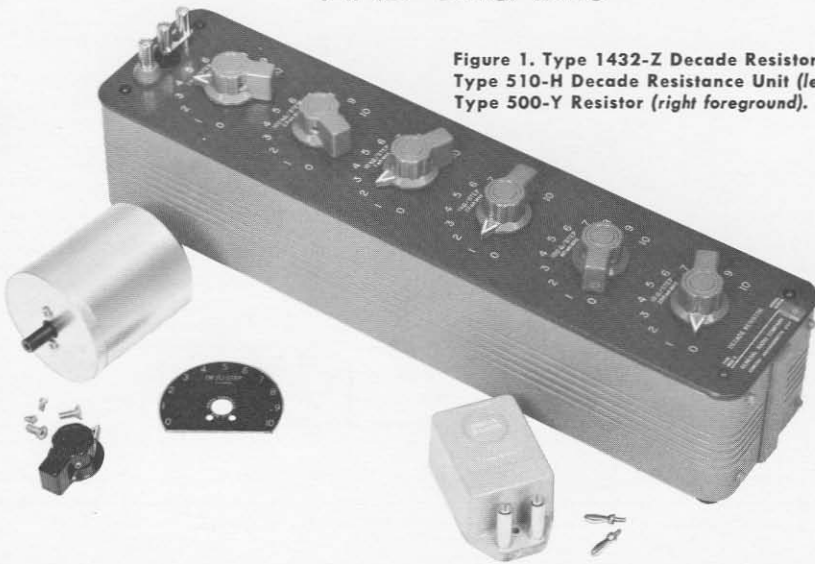


Figure 1. Type 1432-Z Decade Resistor (rear).  
Type 510-H Decade Resistance Unit (left foreground).  
Type 500-Y Resistor (right foreground).

The development of a new, fine-wire 1-megohm resistor has made it possible to extend to higher resistances the range of our series of separately boxed, fixed resistors (TYPE 500), our decade-resistance units (TYPE 510), and our multiple-decade-resistance boxes (TYPE 1432).

Separate 2-megohm, 5-megohm, and 10-megohm fixed units are now available that use the appropriate number of the new resistors in series. The decades use ten units to give a total of 10 megohms in 1-megohm steps.

Like other GR resistors of 500 ohms and higher, these new units are single-

layer wound on a thin, card-type form. This type of resistor has lower inductance and capacitance than does a spool-wound resistor and, therefore, has much better ac properties. High-valued resistors of this type must use very fine wire if they are to be wound on a form of reasonable size. Recently developed

winding techniques have made practical the use of 0.5-mil Evahnohm wire, which makes possible one-megohm units that are only slightly larger in size than those of lower resistance values. It is easy to imagine the difficulties of winding wire of this size when one realizes that it is about  $\frac{1}{4}$  the diameter of human hair!

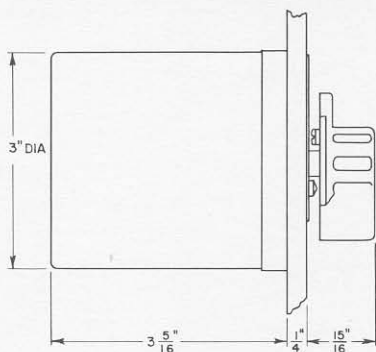


Figure 2. Dimensions of Type 510 Decade-Resistance Unit.

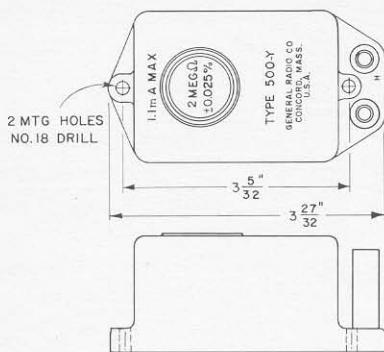


Figure 3. Dimensions of Type 500 Resistor.

## SPECIFICATIONS

### TYPE 500 RESISTORS

Type	DC Resistance	Max Current	Accuracy	Code Number	Price
500-Y	2 megohms	1.1 ma	0.025%	0500-9725	\$28.00
500-Z	5 megohms	0.7 ma	0.025%	0500-9726	62.00
500-ZZ	10 megohms	0.5 ma	0.025%	0500-9504	95.00

Dimensions: See sketch.

Net Weight: 2 ounces (60 grams).

Shipping Weight: 8 ounces (230 grams).

### TYPE 510-H DECADE-RESISTANCE UNIT

DC Resistance		Accuracy*	Max Current	Code Number	Price
Per Step	Total				
1 megohm	10 megohms	0.025%	0.7 ma	0510-9708	\$98.00

Dimensions: See sketch.

Net Weight: 11 ounces (310 grams).

Shipping Weight: 2 pounds (1.0 kg).

\* Each of the 10 resistors in each decade is adjusted to be accurate at its terminals within the tolerance given. Resistance increments are accurate to this same tolerance.

### TYPE 1432 DECADE RESISTOR

Dimensions: Width  $4\frac{5}{16}$  inches (110 mm), height  $4\frac{3}{4}$  inches (120 mm); length,  $15\frac{3}{4}$  inches (400 mm) for Type 1432-Y and  $18\frac{1}{4}$  inches (470 mm) for Type 1432-Z.

Net Weight: Type 1432-Y — 6 pounds, 5 ounces (2.9 kg); Type 1432-Z — 7 pounds, 8 ounces (3.4 kg).

Shipping Weight: Type 1432-Y — 7 pounds (3.2 kg); Type 1432-Z — 9 pounds (4.1 kg).

Type	Resistance		No. of Dials	Type 510 Decades Used	Code Number	Price
	Total	Per Step				
1432-Y	11,111,000 ohms	100 ohms	5	D, E, F, G, H	1432-9725	\$229.00
1432-Z	11,111,100 ohms	10 ohms	6	C, D, E, F, G, H	1432-9726	262.00