

Type 1490 DECADE INDUCTOR

Type 940 DECADE-INDUCTOR UNIT

FEATURES:

- ◆ High values of storage factor Q , with maximum values above 200.
- ◆ Toroidal construction minimizes external magnetic fields, so that the coils can be stacked without errors from mutual inductance. The toroids are nearly astatic to external magnetic fields.
- ◆ Aluminum covers provide electrostatic shielding and mechanical protection.
- ◆ Wax dipping keeps out moisture.
- ◆ The switch is inherently reliable in extensive use and should not require bothersome cleaning or adjustment in service.

USES: These inductance decades are convenient elements for use in wave filters, equalizers, and tuned circuits throughout the range of audio and low radio frequencies. As components in oscillators, analyzers, and similar equipment, they are especially useful during the preliminary design period, when the ability to vary circuit elements over relatively wide ranges is necessary to determine optimum operating values. As moderately precise standards of inductance they have values of low-frequency storage factor, Q , which are much larger than those of air-cored coils.

DESCRIPTION: Each TYPE 940 Decade-Inductor Unit is an assembly of four TYPE 1481 Inductors (relative values,

1, 2, 2, 5) wound on molybdenum-permalloy dust cores, which are combined by switching to give the eleven successive values from 0 to 10. The decade switch has high-quality ceramic stator-and-rotor members and utilizes a well-defined ball-and-socket detent. All contacts are made of a silver alloy and have a positive wiping action.

The TYPE 1490 Decade Inductor is an assembly of three or four TYPE 940 Decade-Inductor Units in a single metal cabinet. The units have no electrical connection to the panel, but a separate ground terminal is provided which can be connected to the adjacent low terminal, which leads to the smallest decade.

SPECIFICATIONS

Accuracy: Each unit is adjusted so that its inductance at zero frequency and initial permeability will be the nominal value within the accuracy tolerance given in the following table:

Inductance per step	100 μ h	1 mh	10 mh	100 mh	1 h
Accuracy	$\pm 2\%$	$\pm 2\%$	$\pm 1\%$	$\pm 0.6\%$	$\pm 0.6\%$

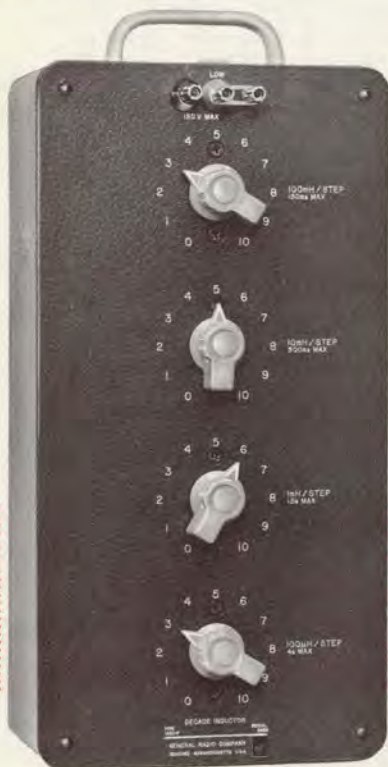
Frequency Characteristics: For any specific operating frequency, Figure 2 shows the percentage increase in effective series inductance (above the value when $f = 0$) which is encountered with the extreme settings of each of the five decade-inductor units when the chassis is floating. Interpolation may be used for intermediate settings.

For the TYPE 1490 Decade Inductors, the percentage increase in effective series inductance (above the zero frequency value, L_0) may be obtained by interpolation in Figure 3 for any setting of the highest-valued decade used, when the low terminal is grounded to the cabinet.

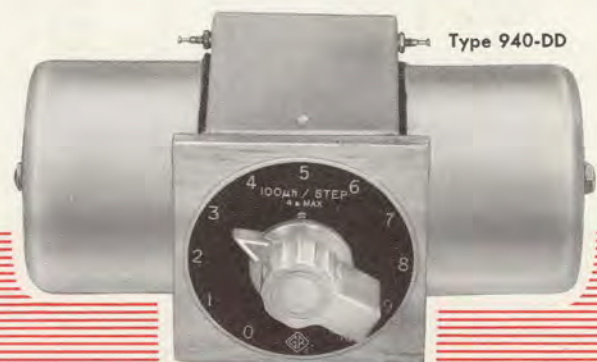
Change in Inductance with Current: Fractional change in initial inductance with ac current for each type of toroid is shown in the normal curves, Figure 1, in terms of the ratio of the operating current, I , to I_1 , the current for 0.25% change, solid line (0.1%, broken line). For ratios below unity, inductance change is directly proportional to current. Values of I_1 , listed below, are approximate and are based on the largest inductor in the circuit for each setting.

Incremental Inductance: DC bias current I_b will reduce the initial inductance as shown in the incremental curves, Figure 1.

Switch Setting	RMS I_1 (ma)				
	0.1% Increase	0.25% Increase			
		940-DD	940-E	940-F	940-G
1	141	24	7.6	2.4	0.76
2, 3, 4	100	17	5.4	1.7	0.54
5, 6, 7, 8, 9, 10	63	11	3.4	1.1	0.34



Type 1490-F



Type 940-DD