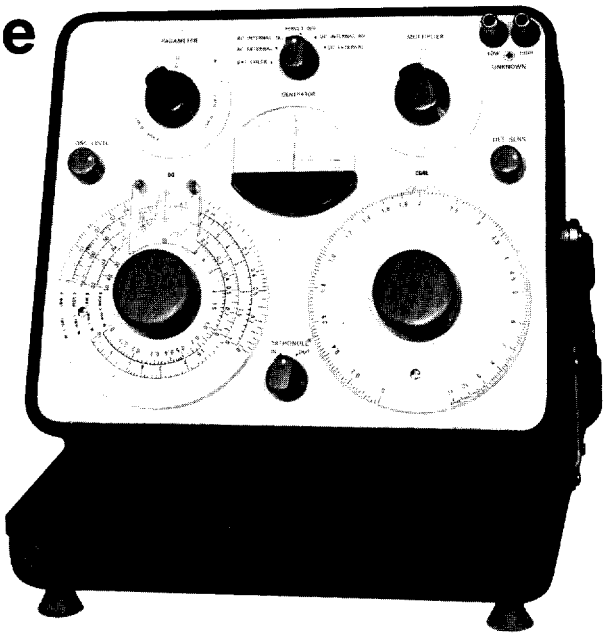
1650-B Impedance Bridge



- **measures L, C, and loss; R and G**
- **1% accuracy**
- **20 Hz to 20 kHz, internal 1 kHz and dc**
- **portable, self-contained, battery-operated**

The 1650 Impedance Bridge will measure the inductance and storage factor, Q, of inductors*, the capacitance and dissipation factor, D, of capacitors, and the ac and dc resistance or conductance of resistors.

Three-terminal measurements can be made in the presence of considerable stray capacitance to ground.

This bridge is completely self-contained and portable. Battery-powered, low-drain solid-state oscillator and detector are included. The panel meter indicates both dc and ac bridge unbalances.

The measured quantities, R, G, L, C, D, and Q, are indicated directly on dials with logarithmic scales for constant percentage accuracy. Multipliers and the units of measurement are indicated by the range setting.

The bridge circuit elements are high-quality, stable components that ensure long-term accuracy. The Ortho-null® balance finder, a patented mechanical-ganging device, is used to make a low-Q (high-D) balance possible without a sliding null. This mechanism, which may be switched in or out as desired, adds accuracy as well as convenience to low-Q measurements that are practically impossible on other impedance bridges.

The Flip-Tilt case provides a convenient handle and a captive protective cover and base that allow the bridge panel to be tilted for use at any angle.

* Including such low-Q inductors as rf coils measured at 1 kHz.

— Note: This product is manufactured also in Europe.
— See **GR Experimenter** for March/June 1970.

SPECIFICATIONS

Ranges of Measurement	Accuracy		
	20 Hz to 20 kHz †	DC	Residuals
Capacitance 1 pF to 1100 μF, series or parallel, 7 ranges	±1% ± 1 pF	—	≈ 0.5 pF
Inductance 1 μH to 1100 H, series or parallel, 7 ranges	±1% ± 1 μH	—	≈ 0.2 μH
Resistance ac or dc, 1 mΩ to 1.1 MΩ, 7 ranges	±1% ± 1 mΩ	±1%, 1 Ω to 100 kΩ, ext supply or detector required for > 100 kΩ and < 1 Ω.	≈ 1 mΩ
Conductance ac or dc, 1 n℧ to 1.1 ℧, 7 ranges	±1% ± 1 n℧	±1%, 10 μ℧ to 1 ℧, ext supply or detector required for < 10 μ℧.	
Dissipation Factor, D, at 1 kHz: 0.001 to 1, of series C, 0.1 to 50, of parallel C.	±5% ± 0.001 at 1 kHz and lower	—	
Storage Factor, Q, at 1 kHz: 0.02 to 10, of series L, 1 to 1000, of parallel L.	1/Q accurate to ±5 ± 0.001 at f ≤ 1 kHz	—	

† Bridge operates up to 100 kHz with reduced accuracy.

Generator: Internal; 1 kHz ±2%. Type 1310 or 1311 Oscillator recommended if external generator is required. Internal dc supply, 6 V, 60 mA, max.

Detector: Internal or external; internal detector response flat or selective at 1 kHz; sensitivity control provided. Type 1232-A Tuned Amplifier and Null Detector is recommended if external detector is required. Combination of 1311 oscillator and 1232 detector is available as the 1240 Bridge Oscillator-Detector.

DC Polarization: Capacitors can be biased to 600 V from external dc power supply for series capacitance measurements.

Required: None. Earphones can be used for high precision at extremes of bridge ranges.

Available: Type 1650-P1 TEST JIG.

Power: 4 size-D cells, supplied.

Mechanical: Flip-Tilt case and rack mount. DIMENSIONS (wxhxd): Portable, 13x6.75x12.25 in. (330x171x311 mm); rack, 19x12.25x4.13 in. (483x311x105 mm). WEIGHT: Portable, 17 lb (8 kg) net, 21 lb (10 kg) shipping; rack, 18 lb (9 kg) net, 30 lb (14 kg) shipping.

Description	Catalog Number
1650-B Impedance Bridge	
Portable Model ◈	**1650-9702**
Rack Model	**1650-9703**
Replacement Battery, size D cell, 4 req'd	**8410-0200**

Patent Number 2,966,257.

◈ Federal stock numbers are listed before the Index.