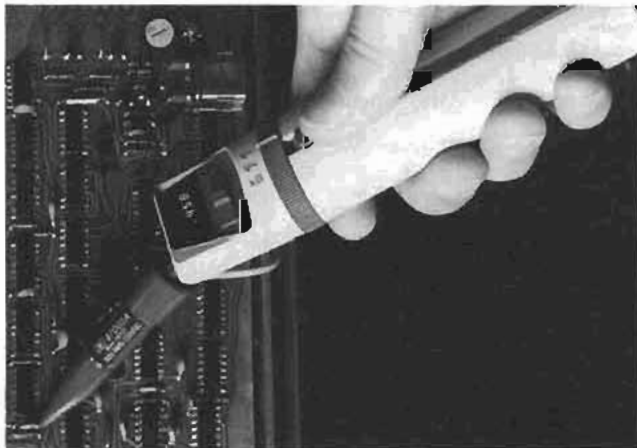
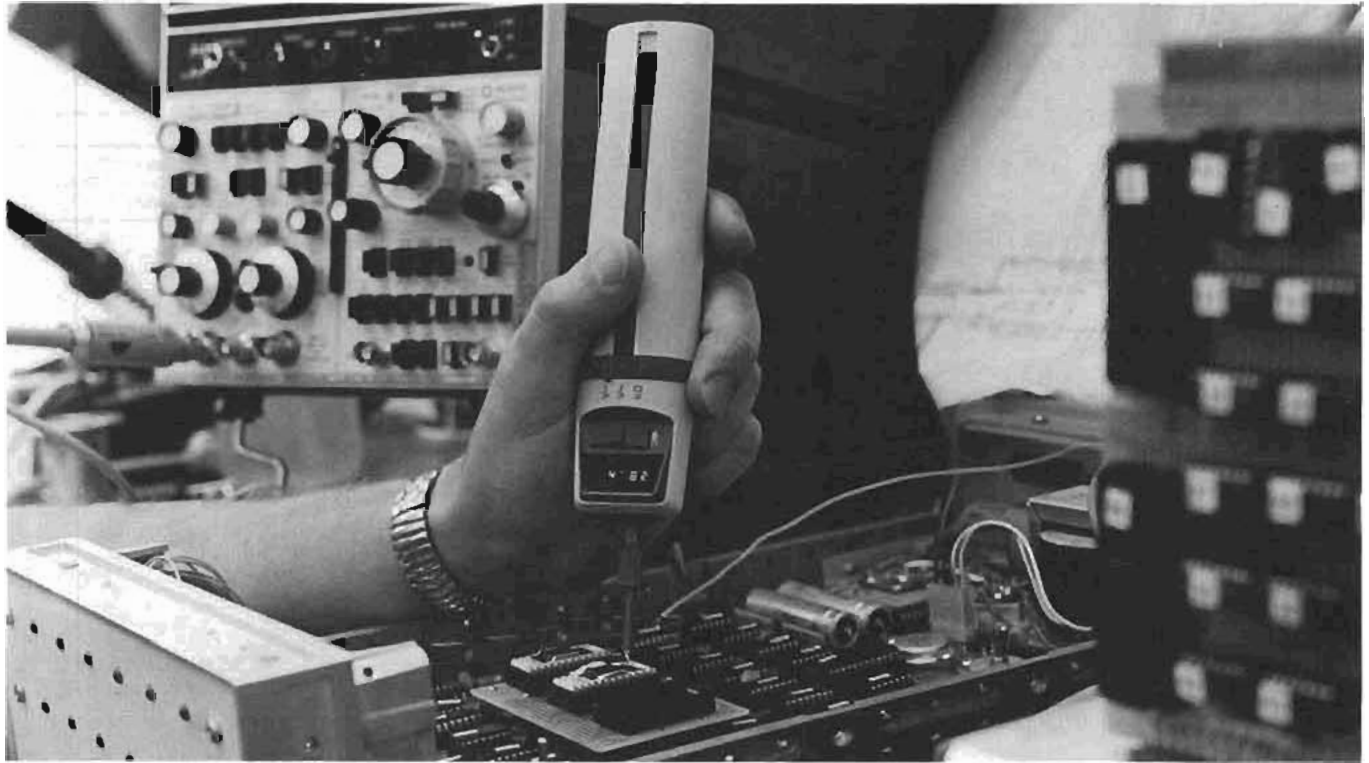


# DIGITAL VOLTMETERS

Digital multimeter

Model 970A

- Puts a complete DMM in the palm of your hand
- Autoranging, autozero, autopolarity



## Description

Hewlett-Packard's 970A Probe Digital Multimeter is completely self-contained and autoranges through five ranges of ac and dc volts and ohms.

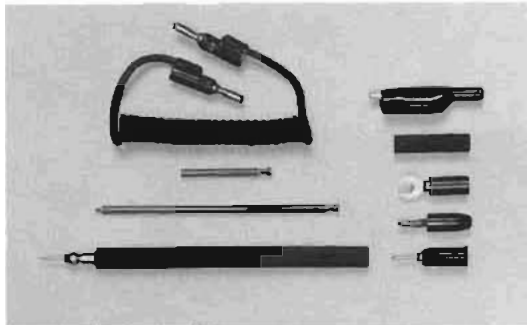
The pocket-sized multimeter is ideal for field, lab, or bench application. All electronics, including display and batteries, are in one small seven-ounce hand-held package with only one function control to set.

HP's Model 970A automatically selects the right range, making it easy to use by technicians, repairmen, telephone craftsmen and engineers. This battery-operated probe is the first known hand-held DMM incorporating solid-state autoranging technology. All solid-state switching is in its one MOS integrated circuit.

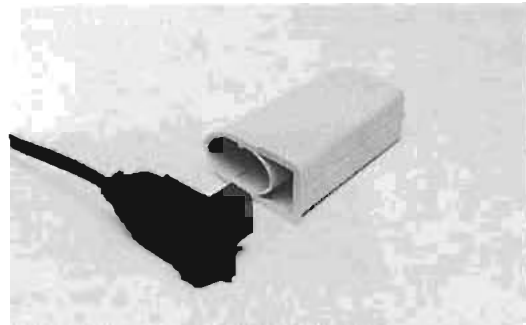
A five-digit light emitting diode cluster is used in this 3 1/2 digit DMM. All probe voltage readings are in volts, and resistance readings in kilohms so there are no scales to misinterpret. Decimal placement is automatic.

Automatic decimal placement and automatic polarity indication save time. After setting the function selector (acV, dcV or k $\Omega$ ), simply connect the ground clip, touch the probe tip to a test point, press the Push-to-Read bar, and the solid-state LED readout automatically displays the correct reading and polarity. When measuring ohms or dc volts, it takes typically less than two seconds to range and settle to a proper reading.

Since display is close to point of measurement, in closely packed circuits, the probe can be held in one hand and circuit and readout can be seen at a glance. The display can be electronically inverted to avoid errors.



97004A Accessory Kit



97010A UL Approved Battery Charger

HP's 970A Probe Digital Multimeter can be converted into a five-function bench instrument with optional 97002A Current Shunt/Bench Cradle. A six-position manual switch selects five ranges of ac and dc current plus a straight through position to measure ac and dc volts and ohms.

Two general purpose binding posts accept wrap-around, screw-down, clip-on or banana plug terminations.

AC voltage measurements can be made over a frequency range of 100 kHz to 500 MHz from 0.25 V to 30 V with optional RF adapter, HP 97003A. A broad line of tips, adapters and tees are also available.

### 970A Specifications

#### DC voltmeter

**Ranges:** 0.1 V, 1 V, 10 V, 100 V, 1000 V (500 V max input).  
**Accuracy (20°C to 30°C):** ±(0.7% of reading + 0.2% of range).  
**Input resistance:** 10 MΩ, ±5%.  
**Input protection:** ≤750 V peak.  
**Temperature coefficient:** ±(0.05% of reading + 0.2% of range)/°C.

#### AC voltmeter

**Ranges:** 0.1 V, 1 V, 10 V, 100 V, 1000 V (500 V rms sine wave max input).  
**Accuracy (20°C to 30°C):**

Range	45 Hz to 1 kHz	1 kHz to 3.5 kHz
1 V to 1000 V	±(2% of reading + 0.5% of range)	±(3% of reading + 0.5% of range)
0.1 V (>3 mV)	±(2% of reading + 0.5% of range)	±(5% of reading + 0.5% of range)

**Input resistance:** 10 MΩ, ±5%  
**Input capacitance:** <30 pF.  
**Input protection:** ≤750 V peak.  
**Temperature coefficient:** ±(0.05% of reading + 0.05% of range)/°C.

#### Ohmmeter

**Ranges:** 1 kΩ, 10 kΩ, 100 kΩ, 1000 kΩ, 10,000 kΩ.  
**Accuracy (20°C to 30°C):** ±(1.5% of reading + 0.2% of range).  
**Input voltage protection (resistor fused - clip mounted):** ≤115 V rms for up to 1 minute. ≤250 V rms for up to 10 seconds.  
**Temperature coefficient:** ±(0.05% of reading + 0.02% of range)/°C.

#### General

**Ranging:** automatic.  
**Sample rate:** 3/second.  
**Overrange:** 10%.  
**Calibration cycle:** 1 year.  
**Calibration adjustments:** one.  
**Operating environmental conditions:**  
**Temperature range:** 0°C to 40°C.  
**Humidity:** ≤95% RH.  
**Power:** rechargeable batteries.  
**Typical operating time using fully charged battery:** 2 hours continuous at 25°C.  
**Typical battery charging time:** 14 hours at 25°C. (Indefinite charging will not damage battery).  
**Weight (with battery pack):** net, 200 g (7 oz). Shipping, 1.8 kg (4 lb).  
**Dimensions:** 165 mm long × 45 mm wide × 30 mm deep (6½" × 1¾" × 1¼").

### 97002A Specifications

#### DC ammeter

**Ranges:** 0.1 mA, 1 mA, 10 mA, 0.1 A, 1 A F.S.  
**Accuracy (20°C to 30°C):** ±(2.5% of reading + 0.2% of range).

#### AC ammeter

**Ranges:** 0.1 mA, 1 mA, 10 mA, 0.1 A, 1 A F.S.  
**Accuracy (20°C to 30°C, >3% of range):** 45 Hz to 1 kHz: ±(4% of reading + 0.5% of range). 1 kHz to 3.5 kHz: ±(7% of reading + 0.5% of range).

**DC V, ac V, ohms:** same as 970A specifications.

#### General

**Full range insertion voltage:** <0.25 V.  
**Input protection:** 2 amp fast acting fuse.  
**Weight:** net, 170 g (6 oz). Shipping, 1.8 kg (4 lb).  
**Dimensions:** 95 mm long, 95 mm wide, 51 mm deep (3¾" × 3¾" × 2").

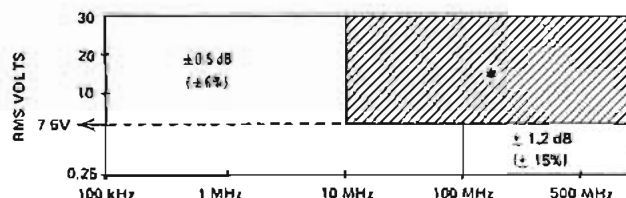
### 97003A Specifications

**Response:** The 97003A is a peak responding detector and is calibrated to read rms value of a sine wave.

**Voltage range:** 0.25 V to 30 V rms.

**Max Input:** 30 V rms ac; 200 V dc.

**AC to dc transfer accuracy when operating into HP 970A:**



\*HP's 97003A is usable from 10 MHz to 500 MHz and 7.5 V rms to 30 V rms. It is not traceable to the United States National Bureau of Standards over that range.

**Input impedance:** input resistance: >25 kΩ.

**Shunt capacitance:** <3 pF for plastic tips. <4 pF for metal high frequency adapter tip.

#### General

**Accessories supplied:** ground lead, straight tip, battery charger, soft carrying case.

**Accessories available:** 11063A, 50-ohm tee; 11536A, 50-ohm tee; 10218A, BNC Adapter; 10219A, Type 874 Adapter; 10220A, Micro-dot Adapter.

#### Model number and name

Model number and name	Price
97001A extra rechargeable battery pack	\$27
97002A ac/dc current shunt/bench cradle	\$49
97003A RF adapter	\$88
97004A accessory kit	\$36
97010A battery charger	\$13
970A Digital Multimeter (includes soft carrying case, battery and charger)	\$310