Hewlett-Packard offers over 250 measuring instruments for manufacturing, industrial and scientific research, equipment maintenance, communications and military use.

Each "hp" instrument gives you the economies of fast, accurate performance, broad usefulness, and dependable service. Each has the familiar "hp" characteristics of simple operation, minimum adjustment, independence of line voltage or tube changes, generous overload protection and highest quality design and construction.

This catalog gives brief details of major "hp" instruments. For complete information, see your "hp" representative, or write direct.
-hp- Oscillators — Signal Generators .01 to 10,000,000 cps

-HP- 200 SERIES AUDIO OSCILLATORS

Four widely used -hp- oscillators have been redesigned into two compact, lightweight instruments offering wider frequency range, more operating simplicity, highest accuracy and stability. New Models 200AB and 200CD replace Models 200A through 200D, retain the time-tested RC circuits that insure constant output, low distortion; require no zero adjustment. Also offers Model 200D, a spread-scale oscillator for interpolation or where frequency must be known precisely.

-HP- 650A TEST OSCILLATOR

Highly stable, wide band (10 cps to 10 mc) multi-purpose test oscillator for audio, supersonic, video, and rf measurements. Output variable 30 mv to 3 v. Frequency response flat ± 1 db. Output impedance 600 ohms, or 6 ohms with voltage divider. $490.00.Δ

-HP- Distortion, Wave Form Analyzers — 20 cps to 20 kc

-HP- 330B DISTORTION ANALYZER

Measures distortion as low as 0.1%, 20 cps to 20 kc. Measures noise voltages as low as 100 µV. High sensitivity, high stability, broad applicability for broadcast, laboratory or production. Wide band 20 db gain input amplifier. Built-in VTVM usable separately. $410.00.Δ

FM, AM-FM MODELS

-HP- 330C, for FM broadcasters, includes VU meter meeting F.C.C. requirements. -HP- 330D, for AM-FM broadcasters, includes AM detector to rectify AM carrier, plus VU meter employed in model 330C. Model 330C, $440.00.Δ; Model 330D, $455.00.Δ

-HP- 400D VACUUM TUBE VOLTMETER

Best -hp- voltmeter ever built! Covers all frequencies 10 cps to 4 mc. Extremely sensitive, wide range, accurate within 2% to 1 mc, measures 0.1 mv to 300 v. Direct reading in dbm. 10 meg-ohm input impedance insures negligible loading on circuits under test. New amplifier circuit with 56 db mid-range feedback assures utmost stability, freedom from change due to external conditions. $225.00.

-HP- Vacuum Tube Voltmeters — 2 to 700,000,000 cps

-HP- 400D VACUUM TUBE VOLTMETER

-HP- 400A General purpose ac measurements

-HP- 400B Low frequency ac measurements

-HP- 400D Wide range ac measurements. High sensitivity

-HP- 402A Portable, battery operated

-HP- 401B Audio, rf, VHF measurements; dc voltages; resistances

-HP- Voltmeter Accessories (not listed) include voltage dividers, connectors, shunts and multipliers to extend the useful range of your equipment.

Δ Includes new lightweight all-metal cabinet with carrying handles. Also available for rack mounting at slightly lower prices.

Data subject to change without notice. Prices f.o.b. factory.
Other -hp- Frequency Measuring and Monitoring Equipment

**-hp- 100D SECONDARY FREQUENCY STANDARD**

Swift, sure frequency comparison, new convenience in standardizing with minimum external equipment. 100 µsec time markers, built-in oscilloscope, sine or rectangular waves. Low output impedance; short-time stability 1/1,000,000. Performs most functions of primary standards in audio, rf or supersonic ranges. $615.00.

**-hp- 335E TV MONITOR**

Channels 2 through 83. Exceeds F.C.C. requirements. Compact, only 12½" high, rack mounted. Low cost, all purpose, for visual and aural frequency monitoring. Long-term dependability, precise accuracy, highest stability, no adjustment during operation. Forced ventilation, remote indication features. $1,950.00.

**-hp- 512A/B FREQUENCY CONVERTERS**

Two new -hp- Frequency Converters extend range of -hp- 524A Electronic Counter without loss of accuracy and with increased sensitivity. -hp- 512A covers frequencies 10 to 100 mc, 512B covers 100 to 220 mc. Complex setups eliminated, are easily used by non-technical personnel. -hp- 512A, 512B, $350.00.

**-hp- 522B ELECTRONIC COUNTER**

Compact, low cost, versatile instrument for frequency, period or time measurements. Range 10 cps to 100 kc. Reads direct in cps, kc, seconds or milliseconds. Count automatically reset, action repetitive. Stability of time base 5/1,000,000. Display length variable. Easily used by untrained personnel. $915.00.

**-hp- 525A Frequency Counter**

Extends Counter’s basic 10 cps to 10 mc range to 100 mc; increases video sensitivity to 0.1 v, 10 cps to 10 mc. $225.00.

**-hp- 525B Frequency Counter**

Gives Counter range from 100 to 220 mc at 0.25 v sensitivity. $225.00.

**-hp- 526A Video Amplifier**

Increases Counter’s sensitivity between 10 cps and 10 mc to 10 millivolts for low level work. $125.00.

**-hp- 526B Time Interval Unit**

Measures interval 1 µsec to 100 days with accuracy of 0.1 µsec ± 0.001%. Reads direct in seconds, milliseconds, microseconds. $150.00.

(Plug-in units supplied in aluminum storage cases)

### Frequency Measuring and Monitoring Equipment

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Primary Uses</th>
<th>Frequency Range</th>
<th>Characteristics</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>-hp- 100C Secondary Standard</td>
<td>Audio, supersonic calibration</td>
<td>100 kc, 10 kc, 1 kc, 100 cps</td>
<td>Accurate within ± 0.001% Sine waves only</td>
<td>$465.00</td>
</tr>
<tr>
<td>-hp- 100D Secondary Standard</td>
<td>Frequency, time measurements</td>
<td>100 kc, 10 kc, 1 kc, 100 cps, 10 cps</td>
<td>Stability 1/1,000,000 (short-time) Sine or rectangular output. Marker trips</td>
<td>615.00</td>
</tr>
<tr>
<td>-hp- 335B Frequency Converter</td>
<td>FM broadcast station monitor</td>
<td>88 to 108 mc</td>
<td>Frequency deviation ± 3 kc; accuracy ± 0.001%; modulation 0 to 100 kc</td>
<td>935.00</td>
</tr>
<tr>
<td>-hp- 335E TV Monitor</td>
<td>TV visual, aural and % mod. monitor</td>
<td>Channels 2 through 83</td>
<td>Indicates visual, aural carrier frequency deviation, % modulation aural carrier</td>
<td>1,950.00</td>
</tr>
<tr>
<td>-hp- 505A Frequency Meter</td>
<td>Rapid frequency measurements</td>
<td>10 cps to 50 kc</td>
<td>10 ranges ± 2% accuracy. Input 0.5 to 200 volts</td>
<td>210.00</td>
</tr>
<tr>
<td>-hp- 505A Electronic Tachometer</td>
<td>Measurements of high speed machinery</td>
<td>600 to 3,000,000 rpm</td>
<td>10 ranges ± 2% accuracy</td>
<td>220.00</td>
</tr>
<tr>
<td>-hp- 505B Electronic Tachometer</td>
<td>Same as 505A</td>
<td>10 to 50,000 cps</td>
<td>Same as 505A except calibrated in rps</td>
<td>220.00</td>
</tr>
<tr>
<td>-hp- 510A Mixer</td>
<td>Measure frequency continuously with -hp- 500A and 100 D/C</td>
<td>20 cps to 200,000 cps</td>
<td>Mixes two frequencies, delivers difference to -hp- 500A</td>
<td>200.00</td>
</tr>
<tr>
<td>-hp- 512A Frequency Converter</td>
<td>Extends -hp- 524A range to 100 mc</td>
<td>100 kc to 100 mc</td>
<td>Fast, direct readings of signals to 100 mc with 524A. No charts, interpolation. Min. input 0.01 v</td>
<td>350.00</td>
</tr>
<tr>
<td>-hp- 512B Frequency Converter</td>
<td>Gives -hp- 524A range 100 to 220 mc</td>
<td>100 mc to 220 mc</td>
<td>Same as 512A except for frequency coverage and input 0.14 v RMS min.</td>
<td>350.00</td>
</tr>
<tr>
<td>-hp- 520A Nuclear Calibrator</td>
<td>For counting high-rate pulses</td>
<td>Capacity 100 counts in 2 decades, 10,000,000 cps counting rate</td>
<td>100:1 divider for operation of low speed scalers</td>
<td>615.00</td>
</tr>
<tr>
<td>-hp- 522A Electronic Counter</td>
<td>Wide-range frequency, period measurements</td>
<td>10 cps to 100 kc</td>
<td>Frequency measuring gate time in 1 sec. or multiples; standard frequency counted for period measurements 100 kc</td>
<td>790.00</td>
</tr>
<tr>
<td>-hp- 522B Electronic Counter</td>
<td>Wide-range frequency, period, time interval measurements</td>
<td>10 cps to 100 kc</td>
<td>Measures rate of occurrences 0.0001 to 10,000/sec; time interval 10 µsec to 27.8 hrs.; periods of frequency count 1/100, 1/100, 1/10, 1/10, 1 sec. and multiples. Direct readings in cps, kc, sec. and millisecond.</td>
<td>915.00</td>
</tr>
</tbody>
</table>

△ Includes new lightweight all-metal cabinet with carrying handles. Also available for rack mounting at slightly lower prices.

Data subject to change without notice. Prices f.o.b. factory.

WWW.HPARCHIVE.COM
**-hp- Signal Generators—10 to 11,000 mc**

- **hp- 612A UHF-TV SIGNAL GENERATOR**
  450 to 1,200 mc. Master oscillator-power amplifier generator for UHF-TV measurements including gain, selectivity, sensitivity, image rejection. Directly set and read; no charts, no interpolation. Low incidental fm, high-quality broad band video modulation to 5 mc. May be modulated internally or externally, amplitude modulated or pulse modulated. (Good rf pulses 0.2 \(\mu\)sec or longer.) $1,200.00.

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Frequency Range</th>
<th>Characteristics</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>-hp- 608A</td>
<td>10 to 500 mc</td>
<td>Output 0.1 (\mu)V to 1 V into 50 ohm load. Pulse or CW modulation. Direct calibration.</td>
<td>$850.00</td>
</tr>
<tr>
<td>-hp- 612A</td>
<td>460 to 1,200 mc</td>
<td>Output 0.1 (\mu)V to 0.5 V into 50 ohm load. Pulse, CW or amplitude modulation to 5 mc. Direct calibration.</td>
<td>$1,200.00</td>
</tr>
<tr>
<td>-hp- 614A</td>
<td>800 to 2,100 mc</td>
<td>Output 0.1 (\mu)V to 0.223 V into 50 ohm load. Pulse, CW or FM modulation. Direct calibration.</td>
<td>$1,950.00</td>
</tr>
<tr>
<td>-hp- 616A</td>
<td>1,800 to 4,000 mc</td>
<td>Output 0.1 (\mu)V to 0.223 V into 50 ohm load. Pulse, CW or FM modulation. Direct calibration.</td>
<td>$1,950.00</td>
</tr>
<tr>
<td>-hp- 618B</td>
<td>3,800 to 7,600 mc</td>
<td>Output 0.1 (\mu)V to 0.223 V into 50 ohm load. Pulse, CW, FM or square wave modulation. Direct calibration.</td>
<td>$2,250.00</td>
</tr>
<tr>
<td>-hp- 620A</td>
<td>7,000 to 11,000 mc</td>
<td>Output 0.1 (\mu)V to 0.223 V into 50 ohm load. Pulse, CW, FM or square wave modulation. Direct calibration.</td>
<td>$2,250.00</td>
</tr>
<tr>
<td>-hp- 623B</td>
<td>5,925 to 7,725 mc</td>
<td>Output 70 (\mu)V to 0.223 V into 50 ohm load. FM or square wave modulation. Separate power meter and wave meter section.</td>
<td>$1,750.00</td>
</tr>
<tr>
<td>-hp- 6248</td>
<td>8,500 to 10,000 mc</td>
<td>Output 3.0 (\mu)V to 0.223 V into 50 ohm load. Pulse, FM or square wave modulation. Separate power meter and wave meter section.</td>
<td>$2,245.00</td>
</tr>
</tbody>
</table>

---

**-hp- Waveguide Test Equipment—2.6 to 18 kmc**

Basic, low-cost elements offer utmost flexibility for assembly of exact instrumentation required. Each unit covers entire range of its waveguide size. Simple, sturdy mechanical design; accurate, multi-purpose operation.

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Coastal Type N Conn.</th>
<th>Characteristics</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adapter, Waveguide to Coax</td>
<td>S261A $75.00, G261A $55.00, J261A $50.00</td>
<td>2.6-3.55; 3.7-9.85 kmc.</td>
<td>$135.00</td>
</tr>
<tr>
<td>Cover to choke flange</td>
<td>S270A $65.00, G270A $50.00, J270A $50.00</td>
<td>2.6-3.55 kmc.</td>
<td>$130.00</td>
</tr>
<tr>
<td>Attenuators, Fixed 6, 10, 20 db</td>
<td>S275A $37.00, G275A $30.00, J275A $30.00</td>
<td>1.6-3.55 kmc.</td>
<td>$70.00</td>
</tr>
<tr>
<td>Flaps, 25 db max.</td>
<td>S275A $110.00, G275A $100.00, J275A $90.00</td>
<td>1.6-3.55 kmc.</td>
<td>$225.00</td>
</tr>
<tr>
<td>Calibrated, precision</td>
<td>S280A $260.00, J280A $250.00, H280A $250.00</td>
<td>1.6-3.55 kmc.</td>
<td>$250.00</td>
</tr>
<tr>
<td>Detector Mounts</td>
<td>420A $50.00</td>
<td># Includes Thermistor, installed. See page 6.</td>
<td>$110.00</td>
</tr>
<tr>
<td>Thermistor Mounts (Fixed tuned)</td>
<td>420A $50.00</td>
<td>440A $85.00</td>
<td>$110.00</td>
</tr>
<tr>
<td>Frequency Meters, Reaction</td>
<td>477A $75.00</td>
<td>J535A $120.00</td>
<td>$350.00</td>
</tr>
<tr>
<td>Directional Couplers, Cross Guide: 20, 30 db</td>
<td>S750 $100.00, G750 $85.00, J750 $70.00</td>
<td>2.7-18.0 kmc.</td>
<td>$135.00</td>
</tr>
<tr>
<td>Directional Couplers, Multi Hole: 3, 10, 20 db</td>
<td>S752 $260.00, G752 $210.00, J752 $140.00</td>
<td>2.7-18.0 kmc.</td>
<td>$225.00</td>
</tr>
<tr>
<td>Universal Waveguide Carriage</td>
<td>809B for frequencies 3,000 to 18,000 mc; $160.00</td>
<td>2.7-18.0 kmc.</td>
<td>$135.00</td>
</tr>
<tr>
<td>Slotted Sections, Waveguide</td>
<td>8010A $450.00, G810B $390.00, J810B $350.00</td>
<td>2.7-18.0 kmc.</td>
<td>$135.00</td>
</tr>
<tr>
<td>Waveguide Tees, Series</td>
<td>8040A $100.00, G840A $85.00, J840A $70.00</td>
<td>2.7-18.0 kmc.</td>
<td>$135.00</td>
</tr>
<tr>
<td>Shunt</td>
<td>8540A $100.00, G841A $85.00, J841A $70.00</td>
<td>2.7-18.0 kmc.</td>
<td>$135.00</td>
</tr>
<tr>
<td>Hybrid</td>
<td>8545A $130.00, G854A $115.00, J854A $100.00</td>
<td>2.7-18.0 kmc.</td>
<td>$135.00</td>
</tr>
<tr>
<td>Transformers, Slide Screw</td>
<td>8570A $170.00, G870A $140.00, J870A $125.00</td>
<td>2.7-18.0 kmc.</td>
<td>$135.00</td>
</tr>
<tr>
<td>E-H</td>
<td>8580A $225.00, G858A $195.00, J858A $145.00</td>
<td>2.7-18.0 kmc.</td>
<td>$135.00</td>
</tr>
<tr>
<td>Waveguide Phase Shifter</td>
<td>X885A $125.00, G885A $115.00, J885A $100.00</td>
<td>2.7-18.0 kmc.</td>
<td>$135.00</td>
</tr>
<tr>
<td>Terminations, Low Power</td>
<td>8910A $45.00, G910A $40.00, J910A $35.00</td>
<td>2.7-18.0 kmc.</td>
<td>$135.00</td>
</tr>
<tr>
<td>Terminations, High Power</td>
<td>8912A $125.00, G912A $110.00, J912A $90.00</td>
<td>2.7-18.0 kmc.</td>
<td>$135.00</td>
</tr>
<tr>
<td>Moving Load</td>
<td>8914A $100.00, G914A $75.00, J914A $70.00</td>
<td>2.7-18.0 kmc.</td>
<td>$135.00</td>
</tr>
<tr>
<td>Adjustable Shorts</td>
<td>8920A $80.00, G920A $70.00, J920A $65.00</td>
<td>2.7-18.0 kmc.</td>
<td>$135.00</td>
</tr>
<tr>
<td>Broad Band Probe</td>
<td>442B $35.00</td>
<td>All Frequencies</td>
<td>$50.00</td>
</tr>
<tr>
<td>Broad Band Probe, Untuned</td>
<td>444A $50.00</td>
<td>All Frequencies</td>
<td>$50.00</td>
</tr>
</tbody>
</table>

*For use with bolometer or crystal. \(\mu\) For use with bolometer only. \(\mu\) Includes Thermistor, installed. See page 6.

\(\mu\) Includes new lightweight all-metal cabinet with carrying handles. Also available for rack mounting at slightly lower prices.

Data subject to change without notice. Prices f.o.b. factory.

WWW.HPARCHIVE.COM
-hp- Regulated Power Supplies

- hp- 715A POWER SUPPLY
- hp- 715A is a versatile source of regulated beam and reflector voltage for operating most test bench klystron tubes. Beam voltage 250 to 400 v; reflector voltage 0 to 900 v; 6.3 v filament. Internal, 1,000 cps square wave modulation, also 60 cps fm modulation, both on reflector voltage. $300.00.

- hp- 712B POWER SUPPLY
- This new -hp- instrument features high regulation of 0.01%, 0.1 millisecond transient response, internal impedance 0.1 ohms in series with 25 µH; full-load maximum hum less than 500 µv, sealed transformers, chokes and condensers. 0 to 500 v, 200 ma supply and fixed — 300 v tap providing a 50 ma, 300 to 800 v variable supply for klystron operation. $365.00.

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Primary Uses</th>
<th>Characteristics</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>-hp- 710A Power Supply</td>
<td>General purpose regulated plate and filament supply for lab and field use</td>
<td>180 to 360 volts at 75 milliamperes</td>
<td>$ 85.00</td>
</tr>
<tr>
<td>-hp- 710B Power Supply</td>
<td>Same as 710A</td>
<td>100 to 360 volts at 75 milliamperes</td>
<td>100.00</td>
</tr>
<tr>
<td>-hp- 712A Power Supply</td>
<td>Similar to 710A/B. Meets requirements for heavy duty field and lab work</td>
<td>0 to 500 volts at 200 milliamperes 0.01% regulation</td>
<td>365.00</td>
</tr>
<tr>
<td>-hp- 715A Klystron Power Supply</td>
<td>Regulated beam, reflector source for low power klystrons</td>
<td>250 to 400 volts at 50 milliamperes</td>
<td>300.00</td>
</tr>
<tr>
<td>-hp- 717A Klystron Power Supply</td>
<td>Regulated beam, reflector source for Type 5721 klystrons</td>
<td>800 to 1,000 volts at 25 milliamperes</td>
<td>375.00</td>
</tr>
</tbody>
</table>

Equipment below available for most waveguide frequencies

See table at left for data, prices.

- hp- 809B UNIVERSAL PROBE CARRIAGE
- hp- 810 WAVEGUIDE SLOTTED SECTIONS

Convenient, all-purpose -hp- 809B carriage operates with six different -hp- slotted sections, waveguide and coaxial. Mounts sections covering frequencies 3,000 to 18,000 mc—sections interchanged in 30 seconds! Precision-built carriage calibrated in mm to 0.1 mm; dial gauge may be mounted. Operates with -hp- 442B Broad Band Probe and -hp- 440A Coaxial Detector in combination; or with -hp- 444A Untuned Probe.

- hp- 810A/B Slotted Sections—hp- 810B, for mounting in 809B carriage, is a flanged waveguide section with accurately machined slot tapered at ends to minimize reflection. Available in 3 waveguide bands, 5.95 thru 18.0 kmc. -hp- 8810A, complete slotted section assembly including probe carriage. Available for 2.6 to 3.95 kmc band only.

- hp- 420A CRYSTAL DETECTOR
- Employs a silicon crystal to detect rf signals in Type N coaxial line. Covers frequencies 10 mc to 12.5 kmc. Flat frequency response, excellent conversion efficiency. Uses modified 1N21 crystal.

- hp- 281A WAVEGUIDE-COAX ADAPTERS
- Precision broad band attenuation to 50 db. Completely independent of frequency; phase shift constant for all attenuations. Calibrated range 0 to 50 db, maximum error ± 2% of db reading. 8,200 to 12,400 mc. VSWR less than 1.15 full range. Radical new design with rotating attenuator fins.

- hp- 444A UNTUNED PROBE
- A 1N26 crystal plus small antenna in a convenient, easy-to-use housing. Variable penetration depth, no tuning required. Sensitivity equal to single- or double-tuned probes. Frequency range: 2.6 to 18.0 kmc. Mounts in 809B Carriage.

- hp- 487A THERMISTOR MOUNT
- For fast, accurate waveguide power measurements. Each mount covers full range of its waveguide frequency. No tuning required, VSWR less than 1.5. Rugged construction, high temperature coefficient permanent thermistors virtually eliminate delays due to detector element burn-out.

- hp- 485B DETECTOR MOUNTS
- To measure power over complete waveguide range in conjunction with -hp- 430B Power Meter and barretter. Also measures relative level, or detects rf energy using 1N21 or 1N23 crystal. Semi-tuned by movable short to VSWR 1.25.

- hp- 870A SLIDE SCREW TUNERS
- For flattening waveguide systems. The position and penetration of a probe is adjusted to set up a VSWR which is used to cancel existing VSWR in system. VSWR values up to 20 can be corrected with accuracy of 1.02 VSWR.

- hp- X885A PHASE SHIFTER
- For accurate, precisely controlled phase variation throughout X-Band frequencies. Ideal for microwave impedance, transmission measurements, antenna and system design. Direct reading, low power absorption, 360° (electrical) range.

- hp- 752 MULTI-HOLE COUPLER
- Directional couplers available in 7 models with coupling factors of 10 and 20 db ± 0.7 db over full range of a waveguide. VSWR better than 1.05. Directivity 40 db or better over entire range. Available as a 3-terminal network.

△ Includes new lightweight all-metal cabinet with carrying handles. Also available for rack mounting at slightly lower prices.

Data subject to change without notice. Prices f.o.b. factory.

WWW.HPARCHIVE.COM
Microwave Power Measuring Equipment

- **(-hp- 430B MICROWAVE POWER METER**
  No computations! Provides instantaneous, automatic power readings directly in db or mw at all frequencies for which there are suitable bolometer mounts. For CW measurements, uses either 1/100 amp. fuse or Sperry 821 barretter. Also measures CW or pulsed power with negative coefficient thermistor. Operates with all mounts in adjacent Table. $250.00.

- **(-hp- 475B/476A BOLOMETER MOUNTS**
  - **(-hp- 476A Universal Bolometer Mount**
    Measures rf power 10 to 1,000 mc. No tuning or adjustment. VSWR less than 1.15, 20 to 500 mc; 1.25, 10 to 1,000 mc. $85.00.
  - **(-hp- 475B Tunable Bolometer Mount**
    Cutoff frequencies Eliminates 400 mc 50 db rejection at 50,000 mc 1,200 mc 1.2 cutoff freq. Harmonic voltages from UHF systems 2,200 mc 4,100 mc.

- **(-hp- 415A STANDING WAVE INDICATOR**
  For use with 803A Bridge; 01 general receiver, 10 to 500 mc. Approx. 5 PV sensitivity over entire band. Direct measurement of SWR, laboratory use. Super-regenerative receiver. For all waveguide or coaxial slotted sections. Gives readings in VSWR or db. Single frequency operation; 300 to 2,000 cps. Low noise level, 0.3 PV sensitivity, 60 db. calib. attenuator. $200.00.

- **(-hp- 477A COAXIAL THERMISTOR MOUNT**
  For frequency range 10 mc to 10 kmc. VSWR less than 1.5. Thermistor element is 200 ohm negative. Input connector type N, output Type BNC. $75.00.

---

Microwave Impedance Measuring Equipment

- **(-hp- 805A/B COAXIAL SLOTTED SECTION**
  Range 500 to 4,000 mc. High accuracy, high stability, negligible slope, minimum leakage. Exclusive parallel plane design, VSWR of basic section and connectors, 1.04. (-hp- 805A, 50 ohms, Type N coaxial connector. (-hp- 805B, 46.3 ohms, for 3/8" rigid transmission lines. $475.00.

- **(-hp- 806A COAXIAL SLOTTED SECTION**
  For continuous coverage at all frequencies from 3,000 to 12,000 mc. For use with (-hp- 809B carriage. Section and connector VSWR 1.04 to 8,000 mc. Flexibly connected to 50 ohm impedance, negligible slope. Type N connectors, $200.00.

- **(-hp- 803A VHF BRIDGE**
  Gives fast, direct readings of any impedance between 50 and 500 mc. Measures by sampling electric and magnetic fields in transmission lines. Usable for comparative measurements 3 to 700 mc. Impedance range 2 to 2,000 ohms. Phase angle -90° to +90°, at 52 mc and above. Also measures SWR, % reflected power, VHF system flatness. $495.00.

- **(-hp- 417A VHF DETECTOR**
  For use with 803A Bridge; or general laboratory use. Super-regenerative receiver, 10 to 500 mc. 5 bands. Approx. 5 PV sensitivity over entire band. Direct reading frequency control, thoroughly shielded. $250.00.

---

Data subject to change without notice. Prices f.o.b. factory.
Amplifiers for General Use and Fast-Circuit Work

**-hp- 460A/B AMPLIFIERS**

Complete instrumentation for distortion-free fast pulse measurement.

- **-hp- 460A**
  - **Amplifiers in cascade with -hp- 460B**
  - Fast-Pulse Amplifiers offer up to 90 db gain, 125 v open circuit output. This permits full deflection of 3XP CRT, or 2-inch deflection of 5CP tubes. Rise time 0.0026 psec; can amplify millimicrosecond pulses; gives over 100 mc bandwidth to your standard oscilloscope. -hp- 460A, $185.00; -hp- 460B, $225.00. Connecting cables, plugs, accessories—prices on request.

- **-hp- 450A AMPLIFIER**
  - Time-tested, general purpose instrument, 20 db or 40 db gain, for use wherever wide frequency range and high stability are needed. 10 cps to 1 mc. Negligible phase shift; no spurious responses. $140.00.

- **-hp- 490A/491A TRAVELING-WAVE TUBE AMPLIFIERS**
  - Two new broad band linear instruments providing a new, simple way to amplify, modulate, or increase power to 1 watt. Full S-band coverage—2 to 4 kmc; 30 and 35 db gain, millimicrosecond pulse modulation, radical new coupled-helix design. High gain, low noise. -hp- 490A, $1,100.00. -hp- 491A, $1,100.00 (Includes capsulated tube).

- **-hp- 6248 X-BAND TEST SET**
  - High level, direct reading, portable test set simplifies lab or field work at frequencies from 8,500 to 10,000 mc. RF output .223 v max. High stability attenuator reduces level by 100 db. May be pulsed or fm modulated. Separate section measures external rf power or external frequency. Ideal one-piece unit for measuring sensitivity and selectivity, tuning and power level of radar, gunfire and beacon systems. $2,265.00Δ.

- **-hp- 212A PULSE GENERATOR**
  - Provides continuously variable, high power "fast pulses" of superior wave form. Combines broad general usefulness with 0.02 psec rise and decay time to meet requirements of radar, TV and nuclear work. Pulse length variable 0.07 to 10 psec; minimum over-shoot; 50 watt peak power (50 v to 50 ohms load). Low impedance means accurate pulses can be delivered at a distance from the instrument. Repetition rate variable 50 to 5,000 pps; controlled internally or externally. Synchronizing pulses available in advance of, or following, output pulse. $565.00Δ.

**New Streamlined All-Metal -hp- Cabinets**

3 mounting options, greater flexibility of use

Now you can buy -hp- instruments mounted any of three ways, and, later on, change to any other mounting you wish. This new versatility means greater utilization of your -hp- instruments, and can also increase the flexibility of your entire instrument setup.

**Cabinets.** -hp- instruments having the standard 107/2 x 19" panel are now available in standardized -hp- AC 44 aluminum-and-steel cabinets. Equipped with sturdy carrying handles, these cabinets give your -hp- instruments greater protection, better ventilation, and a clean, rugged, modern appearance. Either the separate back cover or the cabinet itself can be removed quickly and easily. Cabinets are finished in wrinkle grey matching the -hp- grey baked enamel panel faces. Cabinet, with instrument, $15.00; separately, $25.00.

**End frames.** To increase flexibility and convenience of -hp- instruments for bench use, -hp- Model 17 End Frames are offered. These frames are of heavy gauge aluminum, equipped with sturdy carrying handles and finished in -hp- grey baked enamel. They fit all late model -hp- instruments with panel size 107/2 x 19", and may be attached in moments. -hp- 17 End Frames, $7.50 set.

**Rack mounting.** Many -hp- instruments are basically rack mounting and can be installed directly into 19" relay racks. Many other -hp- instruments can be equipped for relay rack mounting at slight additional charge. A complete list of instruments available for rack mounting will be sent on request.

**Smaller -hp- instruments,** too, are now being delivered in new, streamlined cabinets. -hp- 512A/B Frequency Converter, illustrated, shows the rugged, lightweight metal cabinet now offered with such instruments as -hp- 200AB, 200CD, 410B and 715A.

Δ Includes new lightweight all-metal cabinet with carrying handles. Also available for rack mounting at slightly lower prices.

Data subject to change without notice. Prices f.o.b. factory.
In electronic test instruments, Hewlett-Packard gives you complete coverage several different ways.

**In development** — *hp*- engineer teams are continually at work designing and producing accurate, helpful new instruments that meet and anticipate the demands of electronics.

**In instrumentation** — the *hp*- line is the world's largest and most complete. You choose from over 250 instruments the ones that provide exactly the measuring coverage you require.

**In frequency coverage** — *hp*- makes nearly every kind of useful electronic test instrument. And, for almost all useful frequencies, too. For example, *hp*- signal generators offer solid frequency coverage from 10 to 11,000 mc; *hp*- voltmeters from 2 to 700,000,000 cps, oscillators from 0.01 to 10,000,000 cps.

**In personal service** — *hp-* has selected the best independent organizations in America to give you personal help with measuring problems. Electronics specialists — men trained by Hewlett-Packard — save you time by helping select the exact *hp*- instrumentation you need and following through to be sure the equipment is properly utilized to serve you best. These men are located in major business centers — as near as your telephone. Call them when you need personal help, in your plant, today.