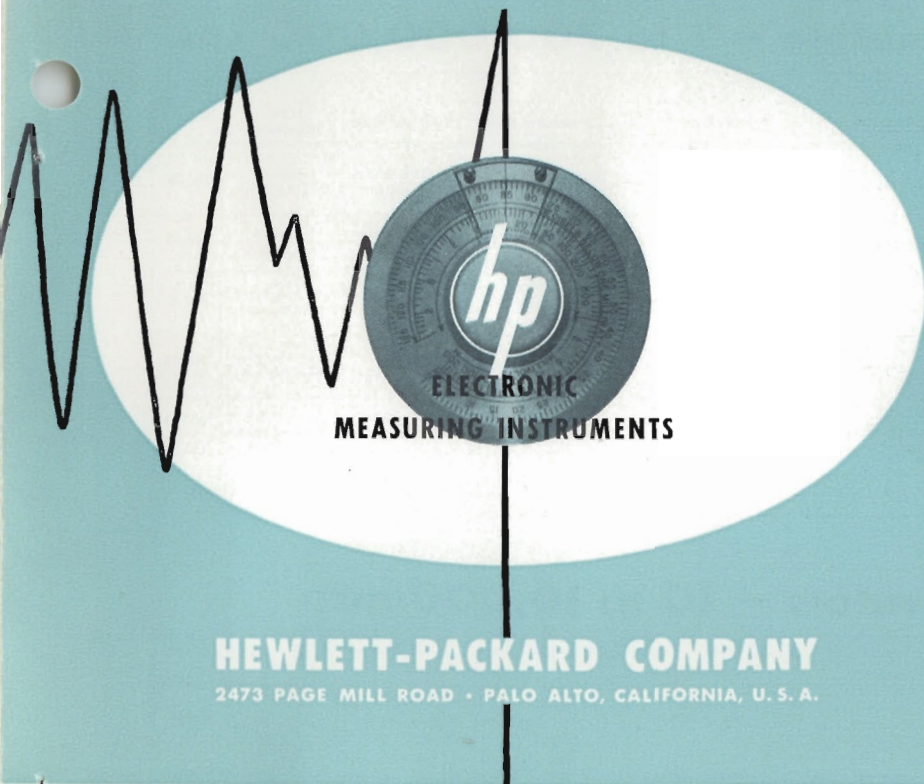


# Complete Coverage in Electronic Test Instrumentation



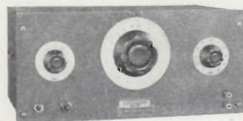
Oscillators, voltmeters, generators, analyzers, amplifiers—frequency measuring, microwave coaxial or waveguide equipment—whatever your measuring needs, there's a precision-built *-hp-* instrument for the job. The *-hp-* line, world's most complete, includes over 200 tested and proved equipments for all types of measurement. Each gives you engineering economies of fast, accurate measurement, broad applicability, dependability, trouble-free service. Each has the traditional *-hp-* "family characteristics" of simple operation, minimum adjustment, independence of line voltage or tube changes, generous overload protection and highest quality design and construction. On these pages you'll find brief details of major *-hp-* instruments. For complete information, see your *-hp-* representative, or write factory direct.

**HEWLETT-PACKARD COMPANY**

2473 PAGE MILL ROAD • PALO ALTO, CALIFORNIA, U. S. A.

## Oscillators — Signal Generators .01 to 10,000,000 cps

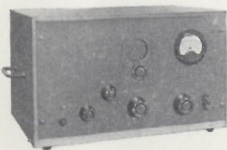
### *-hp-* 200 SERIES AUDIO OSCILLATORS



Six standard models. 200A, 200B have transformer-coupled output, deliver 1 watt into matched load. 200C, 200D and 202D (for sub-audio,

audio, supersonic and carrier measurements) have resistance-coupled output, supply constant voltages over their entire frequency ranges. 200I, 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  $\mu$ v to 3 v. Frequency response flat  $\pm$  1 db. Output impedance 600 ohms, or 6 ohms with voltage divider. \$475.00.

Instrument	Primary Uses	Frequency Range	Output	Price
<i>-hp-</i> 200A	Audio tests	35 cps to 35 kc	1 watt/22.5v	\$120.00
<i>-hp-</i> 200B	Audio tests	20 cps to 20 kc	1 watt/22.5v	120.00
<i>-hp-</i> 200C	Audio and supersonic tests	20 cps to 200 kc	100 mw/10v	150.00
<i>-hp-</i> 200D	Audio and supersonic tests	7 cps to 70 kc	100 mw/10v	175.00
<i>-hp-</i> 200H	Carrier current, telephone tests	60 cps to 600 kc	10 mw/1v	350.00
<i>-hp-</i> 200I	Interpolation and frequency measurements	6 cps to 6 kc	100 mw/10v	225.00
<i>-hp-</i> 201B	High quality audio tests	20 cps to 20 kc	3w/42.5v	250.00
<i>-hp-</i> 202A	Low frequency measurements	.01 cps. to 1 kc	20 mw/10v	450.00
<i>-hp-</i> 202B	Low frequency measurements	1/2 cps to 50 kc	100 mw/10v	350.00
<i>-hp-</i> 202D	Low frequency measurements	2 cps to 70 kc	100 mw/10v	275.00
<i>-hp-</i> 204A	Portable, battery operated	2 cps to 20 kc	2.5 mw/5v	175.00
<i>-hp-</i> 205A	High power audio tests	20 cps to 20 kc	5 watts	390.00
<i>-hp-</i> 205AG	High power tests, gain measurements	20 cps to 20 kc	5 watts	425.00
<i>-hp-</i> 205AH	High power supersonic tests	1 kc to 100 kc	5 watts	550.00
<i>-hp-</i> 206A	High quality, high accuracy audio tests	20 cps to 20 kc	+15 dbm	550.00
<i>-hp-</i> 230A	Carrier test oscillator	35 cps to 35 kc	+14 dbm/600 ohms	275.00
<i>-hp-</i> 233A	Carrier test oscillator	50 cps to 500 kc	3w/600 ohms	475.00
<i>-hp-</i> 234A	Carrier test oscillator	160 cps to 160 kc	+14 dbm/600 ohms	300.00
<i>-hp-</i> 650A	Wide range video tests	10 cps to 10 mc	15 mw/3v	475.00

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

# Precision-built -hp- instruments for every

## -hp- Vacuum Tube Voltmeters – 2 to 700,000,000 cps

### -hp- 410B VACUUM TUBE VOLTMETER



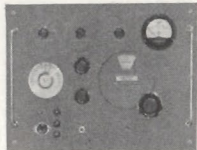
Wide range, flat response  $\pm 1$  db, 20 cps to 700 mc. Convenient, simple to use, occupies minimum bench space. Handy compartment for probe and leads. Diode probe places approximately 1.5  $\mu\text{fd}$  capacity across circuit under test. This, plus high shunt impedance (10 megohms at low frequencies) means circuits under test are not disturbed, and true voltage readings are assured. Also measures dc voltage to 1,000 volts and resistances to 500 megohms. \$245.00.

Instrument	Primary Uses	Frequency Range	Voltage Range	Input Impedance	Price
-hp- 400A	General purpose ac measurements	10 cps to 1 mc	.005 to 300 v 9 ranges	1 megohm 24 $\mu\text{fd}$ shunt	\$185.00
-hp- 400B	Low frequency ac measurements	2 cps to 100 kc	.005 to 300 v 9 ranges	10 megohms 24 $\mu\text{fd}$ shunt	195.00
-hp- 400C	Wide range ac measurements. High sensitivity	20 cps to 2 mc	.0001 to 300 v 12 ranges	10 megohms 15 $\mu\text{fd}$ shunt	200.00
-hp- 404A	Portable, battery operated	2 cps to 50 kc	.0005 to 300 v 11 ranges	10 megohms 20 $\mu\text{fd}$ shunt	185.00
-hp- 410B	Audio, rf, VHF measurements; dc voltages; resistances	20 cps to 700 mc	.1 to 300 v 7 ranges	10 megohms 1.5 $\mu\text{fd}$ shunt	245.00

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

## -hp- Signal Generators – 10 to 10,000 mc

### -hp- 618A SIGNAL GENERATOR



3,800 to 7,600 mc. Provides a 1 mw signal into a 50-ohm coaxial load (zero dbm). Output attenuator directly calibrated in dbm and volts, reduces output level to less than -100 dbm. Frequency dial directly calibrated, accuracy  $\frac{1}{2}$  of 1%. Repeller voltage automatically tracked. No adjustment during operation. CW, pulsed or fm output. Internal square wave modulation. \$2,250.00.

Instrument	Frequency Range	Characteristics	Price
-hp- 608A	10 to 500 mc	Output 0.1 $\mu\text{v}$ to 1 v into 50 ohm load. Pulse or CW modulation. Direct calibration.	\$ 850.00
-hp- 610B	450 to 1,200 mc	Output 0.1 $\mu\text{v}$ to 0.1 v into 50 ohm load. Pulse, CW or Square wave modulation. Direct calibration.	925.00
-hp- 614A	800 to 2,100 mc	Output 0.1 $\mu\text{v}$ to 0.223 v into 50 ohm load. Pulse, CW or FM modulation. Direct calibration.	1,950.00
-hp- 616A	1,800 to 4,000 mc	Output 0.1 $\mu\text{v}$ to 0.223 v into 50 ohm load. Pulse, CW or FM modulation. Direct calibration.	1,950.00
-hp- 618A	3,800 to 7,600 mc	Output 1.0 $\mu\text{v}$ to 0.223 v into 50 ohm load. Pulse, CW, FM or Square wave modulation. Direct calibration.	2,250.00
-hp- 623B	5,925 to 7,725 mc	Output 70 $\mu\text{v}$ to 0.223 v into 50 ohm load. FM or Square wave modulation. Separate power meter and wave meter section.	1,650.00
-hp- 624A	8,500 to 10,000 mc	Output 3.0 $\mu\text{v}$ to 0.223 v into 50 ohm load. Pulse, FM or Square wave modulation. Separate power meter and wave meter section.	2,250.00

## -hp- Distortion, Wave Form Analyzers – 20 cps to 20 kc

### -hp- 330B DISTORTION ANALYZER



Measures distortion as low as 0.1% at any frequency, 20 cps to 20 kc. Measures noise voltages as low as 100  $\mu\text{v}$ . High sensitivity, high stability, broad applicability for broadcast, laboratory or production problems. Wide band 20 db gain input amplifier. Built-in vacuum tube voltmeter usable separately. \$395.00.

### 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, \$425.00. Model 330D, \$440.00.

Instrument	Primary Uses	Frequency Range	Characteristics	Price
-hp- 300A	Wave form analyzer	30 cps to 16 kc	Variable selectivity; measuring range 1 mv to 500 v	\$625.00
-hp- 320A	Measures total distortion	400 cps and 5 kc	Requires external detector	75.00
-hp- 320B	Measures total distortion	50, 100, 400 cps, 1, 5 and 7.5 kc	Same as above	150.00
-hp- 330B	Measures total audio distortion	20 cps to 20 kc	Includes input amplifier, VTVM	395.00
-hp- 330C	For FM broadcast measurements	20 cps to 20 kc	Special VU meter to meet F.C.C. requirements	425.00
-hp- 330D	For AM, FM broadcast measurements	20 cps to 20 kc	AM detector and VU meter to meet F.C.C. requirements	440.00
SQUARE WAVE GENERATOR				
-hp- 210A	Transient and frequency response	20 cps to 10 kc	Output 30 v peak-to-peak. 3,000 ohm impedance	150.00

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

**HEWLETT - PACKARD**

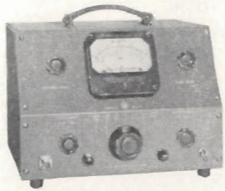


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# -hp- Microwave Test Instruments For Coaxial and Waveguide Systems

## -hp- 430B MICROWAVE POWER METER

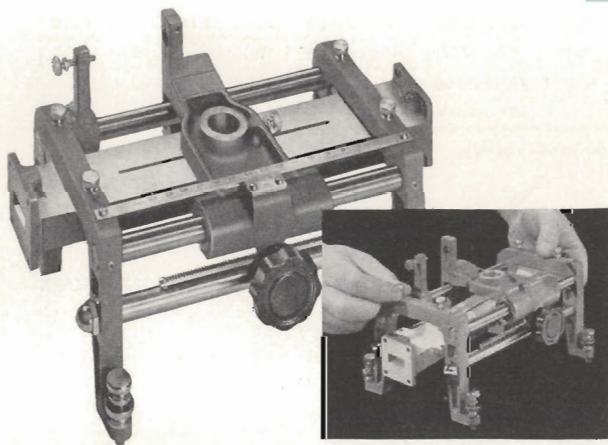


No computations! Provides instantaneous, automatic power readings *direct* in db or mw at all frequencies for which there are suitable bolometer mounts. For CW measurements, uses either 1/100 amp. fuse or Sperry 821 barretter. Also measures CW or pulsed power with negative coefficient thermistor. Operates with *-hp- 475B* or *476A* Bolometer Mounts; also *485B* Detector Mounts. \$250.00.



## -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 line. Usable for comparative measurements 5 to 700 mc. Impedance range 2 to 2,000 ohms. Phase angle  $-90^\circ$  to  $+90^\circ$ , at 52 mc and above. Also measures SWR, % reflected power, VHF system flatness. \$495.00.

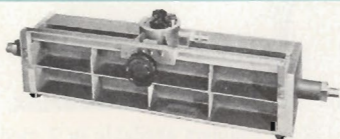


Instrument	Primary Uses	Frequency Range	Characteristic	Price
-hp- 360A-D Low Pass Filters	Eliminates harmonic voltages from UHF systems	Cutoff frequencies A- 700 mc. C-2,200 mc. B-1,200 mc. D-4,100 mc.	50 db rejection at 1.2 cutoff freq.	\$ 50.00
-hp- 415A Standing Wave Indicator	VSWR indicator or null indicator	300 to 2,000 cps. Normal freq. 1,000 cps	0 to 60 db. attn. Max. sensitivity 0.3 $\mu$ v	200.00
-hp- 417A VHF Detector	VHF bridge detector (for -hp- 803A)	10 to 500 mc	Approx 5 $\mu$ v sensitivity	200.00
-hp- 430B Microwave Power Meter	Measurement of rf power	Depends on Bolometer mount	.01 to 10 mw $\pm$ 5% accuracy	250.00
-hp- 475B Tunable Bolometer Mount	Measurement of rf power (with 430B)	1,000 to 4,000 mc	Matches 50-Ohm line to 100 or 200 ohms	200.00
-hp- 476A Universal Bolometer Mount	Measurement of rf power (with 430B)	10 to 1,000 mc	No tuning required VSWR less than 1.25	125.00
-hp- 803A VHF Bridge	Measurement of VHF impedance, VSWR	50 to 500 mc	2 to 2,000 ohms impedance $-90^\circ$ to $+90^\circ$ phase angle	495.00
-hp- 805A Coaxial Slotted Section	Measurement of VSWR	500 to 4,000 mc	For Type N Connectors flexible cables	475.00
-hp- 805B Coaxial Slotted Section	Same as above	Same as above	For rigid $\frac{1}{8}$ " RG44/U line	475.00
-hp- 806B Coaxial Slotted Section	Same as above (mounts in 809B)	3,000 to 12,000 mc	For Type N Connectors flexible cables	200.00
-hp- 809B Universal Probe Carriage	Supports 806B section, also G, J, H, X and P 810 Waveguide sections		Accepts 442B and 444A probes	160.00

## -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 interchange 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 (See preceding page for probe details.) *-hp- 809B*, \$160.00.

*-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 5 waveguide bands, 3.95 thru 18.0 kmc. *-hp 8810A*, complete slotted section assembly including probe carriage. Available for 2.6 to 3.95 kmc band only. (See table on preceding page for data, prices.)



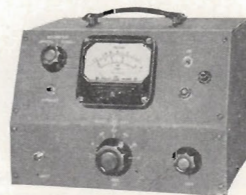
## -hp- 805A/B COAXIAL SLOTTED SECTION

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 coax-connector. *-hp- 805B*, 46.3 ohms, for  $\frac{1}{8}$ " rigid transmission lines. \$475.00.

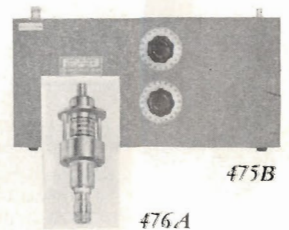
*-hp- 806B* Coaxial Slotted Section, 3,000 to 12,000 mc. For use with *-hp- 809B* carriage. Section and connector VSWR 1.04 to 8,000 mc. 50 ohm impedance, negligible slope. Type N connectors. \$200.00.



*-hp- 417A* VHF Detector for use with 803A Bridge; or general laboratory use. Super-regenerative receiver, 10 to 500 mc. 5 bands. Approx. 5  $\mu$ v sensitivity over entire band. Direct reading frequency control, thoroughly shielded. \$200.00.



*-hp- 415A* Standing Wave Indicator for all waveguide or coaxial slotted sections. Gives direct readings in VSWR or db. Single frequency operation; 300 to 2,000 cps. Low noise level, 0.3  $\mu$ v. sensitivity, 60 db calib. attenuator. \$200.00.



*-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. \$125.00. *-hp- 475B* Tunable Mount, continuous 1,000 to 4,000 mc. \$200.00.

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

HEWLETT - PACKARD

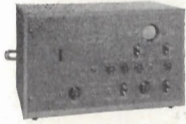


COMPLETE COVERAGE

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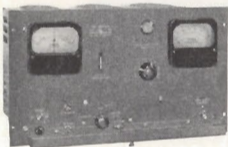
# -hp- Frequency Measuring and Monitoring Equipment

## -hp- 100D SECONDARY FREQUENCY STANDARD



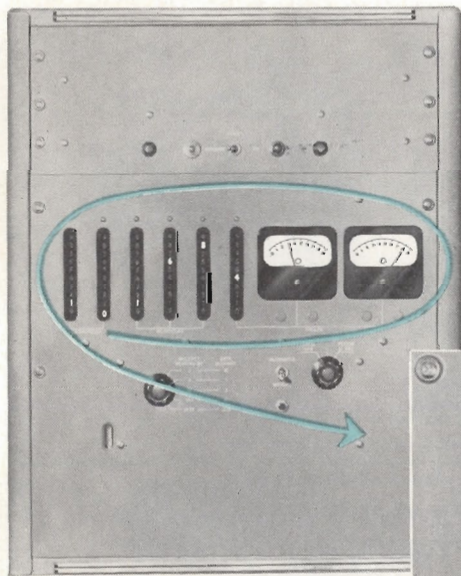
Swift, sure frequency comparison, new convenience in standardizing with minimum external equipment. 100  $\mu$ sec time markers, built-in oscilloscope, sine or rectangular waves. Low output impedance; short-time stability 1/1,000,000. Performs most functions of expensive primary standards in audio, rf or supersonic ranges. \$600.00.

## -hp- 335 FM, TV MONITORS



Precision frequency and modulation meters providing reliable, accurate monitoring of transmitters over long periods of time. No adjustment during operation, no reset F.C.C. approved

Model 335B, 88 to 108 mc, for FM only. 335C, for aural monitoring TV Channels 2 thru 6. 335D, same except for Channels 7 thru 13. See table for prices.



## -hp- 524A FREQUENCY COUNTER

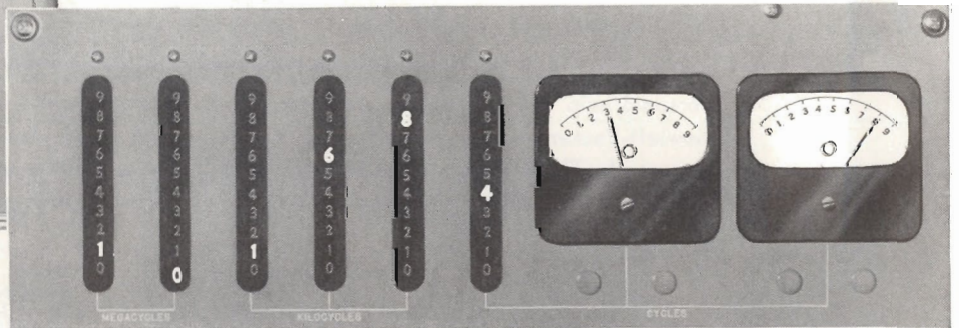
Measures instantly, automatically, presents results directly—determines any frequency from 0.01 cps to 10 mc. This one instrument combines functions of a frequency standard, interpolating meter and detector. Outstandingly simple operation, easily used by non-technical personnel. Just connect unknown to input terminal, and exact frequency appears automatically on front panel. Result is presented repetitively or may be "held" by depressing "manual" button.

Time of count can be adjusted to 10, 1, .1,

.01, or .001 seconds. Accuracy of measurement  $\pm 1$  count  $\pm$  crystal stability (2/3,000,000 per week). For low frequency study, instrument measures duration of one low frequency cycle in microseconds, based on a 10 cycle sample. Accuracy .03%. External higher-accuracy standards usable if desired. Minimum voltage of unknown, 1 volt peak. \$2,000.00.

Instrument	Primary Uses	Frequency Range	Characteristics	Price
-hp- 100C Secondary Standard	Audio, supersonic calibration	100 kc, 10 kc, 1 kc, 100 cps	Accurate within $\pm .001\%$ Sine waves only.	\$450.00
-hp- 100D Secondary Standard	Frequency, time measurements	100 kc, 10 kc, 1 kc, 100 cps, 10 cps	Stability 1/1,000,000 (short-time) Sine or rectangular output. Marker pips.	600.00
-hp- 335B Frequency Monitor	FM broadcast station monitor	88 to 108 mc	Frequency deviation $\pm 3$ kc; accuracy $\pm .001\%$ modulation 0 to 100 kc	935.00
-hp- 335C Frequency Monitor	TV station aural monitor	59.75 to 87.75 mc Channels 2 to 6 inc.	Frequency deviation $\pm 3$ kc; modulation 0 to 33.3 kc	935.00
-hp- 335D Frequency Monitor	TV station aural monitor	179.75 mc to 215.75 mc, channels 7 to 13 inc.	Frequency deviation $\pm 6$ kc, modulation 0 to 33.3 kc	935.00
-hp- 336C Frequency Monitor	TV station video monitor	59.75 to 87.75 mc channels 2 to 6 inc.	Frequency deviation $\pm 3$ kc; accuracy $\pm .001\%$	400.00
-hp- 336D Frequency Monitor	TV station video monitor	179.75 to 215.75 mc channels 7 to 13 inc.	Frequency deviation $\pm 6$ kc, accuracy $\pm .001\%$	400.00
-hp- 337A Frequency Monitor	Communication service monitor	30 to 175 mc (any one frequency)	Frequency deviation $\pm 15$ kc, 20 kc modulation; accuracy .002%	300.00*
-hp- 337B Frequency Monitor	Communication service monitor	30 to 175 mc (any four frequencies)	Same as 337A	350.00*
-hp- 500A Frequency Meter	Rapid frequency measurements	10 cps to 50 kc	10 ranges $\pm 2\%$ accuracy. Input 0.5 to 200 volts.	210.00
-hp- 505A Electronic Tachometer	Measurements of high speed machinery	600 to 3,000,000 rpm	10 ranges $\pm 2\%$ accuracy.	\$300.00
-hp- 505B Electronic Tachometer	Same as 505A	10 to 50,000 rps	Same as 505A except calibrated in rps.	300.00
-hp- 510A Mixer	Measure frequency continuously with -hp- 500A and 100 D/C	20 cps to 200,000 cps	Mixes two frequencies, delivers difference to -hp- 500A.	200.00
-hp- 520A Nuclear Scaler	For counting high-rate pulses	Capacity 100 counts in 2 decades. 10,000,000 pps counting rate	100:1 divider for operation of low speed scalars.	600.00
-hp- 524A Frequency Counter	Frequency, interval, time measurements	.01 cps to 10 mc	Direct reading, no interpolation, accuracy about 2/1,000,000 / week	2,000.00

\*Less: crystals and ovens. Crystal & oven per frequency: \$27.50



Frequency counted above 10,168,438 cps.

- **No computation!**
- **No complex setup!**
- **Usable by anyone!**
- **Instantaneous results!**
- **Broad coverage!**

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



representative or write direct for details.

## -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.

Instrument	Coaxial Type N. Conn.	"S" 3" x 1 1/2" 2.6—3.95 kmc.	"G" 2" x 1" 3.95—5.85 kmc.	"J" 1 1/2" x 3/4" 5.85—8.2 kmc.	"H" 1 1/4" x 3/4" 7.05—10.0 kmc.	"X" 1" x 1/2" 8.2—12.4 kmc.	"P" .702" x .391" 12.4—18.0 kmc.
Adaptors, Waveguide to Coax		S281A \$75.00	G281A \$55.00	J281A \$50.00	H281A \$45.00	X281A \$35.00	
Cover to choke flange		S290A \$40.00	G290A \$30.00	J290A \$25.00	H290A \$20.00	X290A \$15.00	P290A \$20.00
Attenuators, Fixed 6, 10, 20 db		S370 \$75.00	G370 \$65.00	J370 \$65.00	H370 \$60.00	X370 \$55.00	P370 \$60.00
Flap, 25 db max.		S375A \$75.00	G375A \$65.00	J375A \$60.00	H375A \$55.00	X375A \$50.00	P375A \$55.00
Calibrated		S380A \$225.00					
Detector Mounts	440A† \$85.00	S485A‡ \$125.00	G485B† \$95.00	J485B† \$90.00	H485B† \$85.00	X485B† \$75.00	
Frequency Meters, Reaction				J530A \$120.00	H530A \$120.00	X530A \$120.00	
Directional Couplers, Cross Guide: 20, 30 db		S750 \$100.00	G750 \$85.00	J750 \$70.00	H750 \$60.00	X750 \$50.00	
Directional Couplers, Multi Hole: 10, 20 db		S752 \$210.00	G752 \$170.00	J752 \$140.00	H752 \$120.00	X752 \$100.00	
Slotted Sections, Waveguide		S810A* \$450.00	G810B‡ \$90.00	J810B‡ \$90.00	H810B‡ \$90.00	X810B‡ \$90.00	P810B‡ \$90.00
Waveguide Tees, Series		S840A \$60.00	G840A \$50.00	J840A \$40.00	H840A \$35.00	X840A \$30.00	P840A \$35.00
Shunt		S841A \$60.00	G841A \$50.00	J841A \$40.00	H841A \$35.00	X841A \$30.00	P841A \$35.00
Hybrid		S845A \$90.00	G845A \$75.00	J845A \$60.00	H845A \$55.00	X845A \$45.00	P845A \$55.00
Transformers, Slide Screw		S870A \$150.00	G870A \$140.00	J870A \$135.00	H870A \$130.00	X870A \$125.00	P870A \$130.00
E-H		S880A \$175.00	G880A \$155.00	J880A \$145.00	H880A \$135.00	X880A \$130.00	P880A \$135.00
Terminations, Low Power		S910A \$45.00	G910A \$40.00	J910A \$35.00	H910A \$30.00	X910A \$25.00	P910A \$30.00
Terminations, High Power		S912A \$125.00				X912A \$75.00	
Moving Load		S914A \$80.00	G914A \$70.00	J914A \$60.00	H914A \$50.00	X914A \$40.00	P914A \$50.00
Adjustable Shorts		S920A \$80.00	G920A \$70.00	J920A \$65.00	H920A \$60.00	X920A \$50.00	P920A \$55.00
Broad Band Probe	442 \$75.00			All Frequencies			
Broad Band Probe, Untuned	444A \$50.00			All Frequencies			

† For use with bolometer or crystal

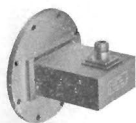
‡ For use with bolometer only

\* Complete assembly including carriage

§ Mounts in 809B Carriage—See next page

Equipment below available for most waveguide bands. Table above shows data, prices.

### -hp- 281A WAVEGUIDE-COAX ADAPTORS



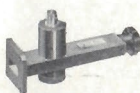
For convenient transition between waveguide and coax systems. Each unit covers a full waveguide range with VSWR less than 1.25. Equipped with Type N connectors.

### -hp- 750 CROSS-GUIDE COUPLERS



Directional couplers offered in 2 models with coupling factors of 20 or 30 db  $\pm$  1.5 db over full range of a waveguide. VSWR less than 1.15; directivity approx. 20 db. Available as a 4-terminal network.

### -hp- 485B DETECTOR MOUNTS



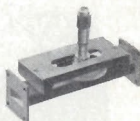
To measure power over complete waveguide range in conjunction with -hp- 430B Power Meter and barretter. Also measures relative level, or detects if energy using 1N21 or 1N23 crystal. Semi-turned by movable short to VSWR 1.25.

### -hp- 530A FREQUENCY METERS



General-purpose reaction meter. Covers a complete waveguide frequency range. High "Q" resonant cavity tuned by plunger. Quick-reference chart converts micrometer reading to frequency. Accuracy 0.1%. No spurious modes or resonances.

### -hp- 870A SLIDE SCREW TUNERS



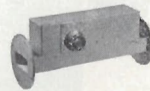
For flattening waveguide systems. The position and penetration of a probe is adjusted to set up a VSWR which is used to cancel existing VSWR in system. VSWR values up to 20 can be corrected with accuracy of 1.02 VSWR.

### -hp- 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. (See next page.)

### -hp- 375A FLAP ATTENUATORS



Simplifies adjusting power level in waveguide. Attenuation is quickly adjustable 0 thru 20 db. Approximate calibration. VSWR less than 1.15 over attenuation range. No leakage.



### -hp- 752 MULTI-HOLE COUPLER

Directional couplers available in 2 models with coupling factors of 10 and 20 db  $\pm$  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.

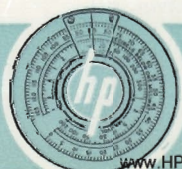


### -hp- 914A MOVING LOAD

Low-reflection load covering full frequency range of guide. Load position variable at least 1/2 wavelength to reverse phase of reflection so that small residual reflections can be evaluated. Coefficient of reflection less than 1/2%.

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

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## -hp- POWER SUPPLIES



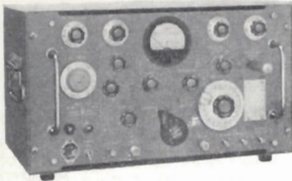
**-hp- 715A** (illustrated) is a versatile source of regulated beam and reflector voltage for operating most test bench klystron tubes. Beam voltage 250 to 400 v; reflector voltage 0 to 900 v; 6.3 v filament. Internal, 1,000 cps square wave modulation, also 60 cps FM modulation, both on reflector voltage.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

**-hp- 710A**—Highly stable regulated dc supply, output variable 180 to 360 v at 75 ma., 6.3 v filament. Either terminal may be grounded.

Total hum and noise less than 5 mv. \$85.00.

**-hp- 712A.** Stabilized, variable power supply providing 0 to 500 v at 200 ma and 1/2% regulation. Also variable bias voltages, 0 to 150 v at 5 ma, and 6.3 v filament at 10 amps. Main supply completely metered. Either terminal may be grounded. Hum less than 8 mv. For laboratory, production or general use. \$250.00.

## -hp- 624A X-BAND TEST SET



High level, direct reading, portable test set simplifies lab or field work at frequencies 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. \$2,250.00.

**-hp- 623B SHF Test Set**, like 624A but operates over frequencies determined by klystron installed. Six klystrons available (each with 300 mc band width) for frequencies between 5,925 and 7,725 mc. Fm modulated. Includes 1,000 cps square wave modulator. \$1,650.00 (with one Klystron).

## -hp- AMPLIFIERS

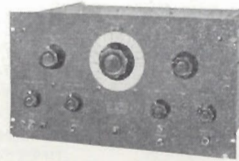


Complete instrumentation for distortion-free fast pulse measurement. **-hp- 460A Wide Band Amplifiers**, in cascade with **-hp- 460B Fast-Pulse Amplifiers** offer up to 90 db gain, 125 v open circuit output. This permits full deflection of 5XP CRT, or 2-inch deflection of 5CP tubes. Rise time 0.0026  $\mu$ sec; can amplify milli-microsecond pulses; gives over 100 mc bandwidth to your standard oscilloscope. 460A, \$185.00; 460B, \$225.00. Connecting cables, plugs, accessories—prices on request.

**-hp- 450A Amplifier**—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- 451A Bridging Amplifier.** For connecting to high impedance circuits without disturbing circuits or affecting operating conditions. 83 megohms impedance probe readily connects to any point in circuit. Amplifier repeats this voltage accurately, without distortion, for operation of VTVM, distortion analyzer, oscilloscope, etc. Frequency 20 cps to 1 mc. \$100.00.

## -hp- 212A PULSE GENERATOR



Provides continuously variable, high power "fast pulses" of superior wave form. Combines broad general usefulness with 0.02  $\mu$ sec rise and decay time to meet requirements of radar, TV and nuclear work. Pulse length variable 0.07 to 10  $\mu$ sec; minimum overshoot; 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. \$550.00.

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