SPECIFICATIONS ARE CONSIDERABLY AMPLIFIED IN A TECHNICAL BULLETIN FOR EACH INSTRUMENT. THESE WILL BE SENT PROMPTLY ON REQUEST.

IF YOU HAVE SPECIAL REQUIREMENTS PLEASE CHECK WITH US.

1965 CATALOG

BALLANTINE

ELECTRONIC MEASURING INSTRUMENTS

VOLT METERS, AC and DC
DC/AC VOLT/ OHMMETERS
DECADE AMPLIFIERS
CALIBRATORS
CAPACITANCE METERS
CONVERTERS, AC/DC LINEAR
LABORATORY VOLTAGE STANDARDS TO 1000 MC
Ballantine's logarithmic scales provide uniform accuracy and resolution over their entire length.

**Conventional Linear Meter Scale**
In a conventional linear meter movement, a small angular deviation, which may represent only an error of $x\%$ at the 10 volt full scale indication, becomes a $2x\%$ error at midpoint and a $5x\%$ error at the 2 volt mark. The lower third of such a meter is practically useless despite the fact that the meter may be rated at better than $x\%$ accuracy fsd (full scale deflection).

**The Ballantine Logarithmic Scale**
In a logarithmic meter, pioneered and used by Ballantine since 1936, the same angular deviation produces a constant $x\%$ error in indication at any point of the scale. The meter readings are uniformly accurate throughout its range. At the low end of the scale the constant angular error represents the same $\%$ of the reading as it does at any other point on the scale.
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**PRICES**

Prices are fob Boonton, N. J., and are subject to change without notice. Prices shown are for the portable version of instruments as shown. Quotations will be given promptly for special versions.
Model 220C
Battery Operated
Designed primarily as a wide band preamplifier for use with
a VTVM or an oscilloscope, when a hum-free stable voltage
gain of 10 or 100 is required. Stable at a wide range of
ambient temperature. Not subject to damage by accidental
high transients as are some transistor devices. Price $150.
Relay Rack Version, Model 220C-S2 Price $170.

SPECIFICATIONS
Voltage Range 25 μV—50 mV
Frequency Range 10 cps—150 kc
Accuracy 2%
Input Impedance 5 MΩ shunted by 15 pf
Output Impedance 2 μF in series with 900Ω
Noise Referred to Input 8 μV short circuit and 25 μV open circuit

BASIC SENSITIVE VTVM Model 300
10 cps to 150 kc
Forerunner of all sensitive, wide band VTVMs. A single
logarithmic voltage scale plus a linear db scale provide ac­
curate, rapid measurements with minimum of range
switching. Useful as a wide band amplifier or to feed a re­
corder. Price $250.
Relay Rack Version, Model 300-S2 Price $270.

SPECIFICATIONS
Voltage Range 1 mV to 100 V
Frequency Range 10 cps—150 kc
Accuracy 2% of Reading
Input Impedance 0.5 MΩ shunted by 30 pF
Scales Logarithmic voltage scale from 1·10;
linear decibel scale from 0 to 20

ISOLED CHASSIS VTVM Model 300E
For "systems" use
Specially designed for building into large test equipments.
Front panel isolated from chassis for connection to system
ground. Rear range switch permits automatic program­
19 Inch Relay Rack Version, with one Model 300E-S2
Price $390.

SPECIFICATIONS
Voltage Range 300 μV—300 V
Frequency Range 10 cps—100 kc
Accuracy to 250 V; 2% of reading elsewhere
Input Impedance 2 MΩ shunted by 15 pF or 25 pF
Scales Logarithmic voltage scale from 3 to 30;
linear decibel scale from 0·20
(Two of these units may be ordered on a 19 inch rack.)

HIGH ACCURACY VTVM Model 300G
Accuracy is 1% of reading
Combines Ballantine's best electrical and mechanical fea­
tures with highest accuracy of calibration and long term
stability. Voltage and db scales separated by mirror for
precise reading. May be used as an amplifier up to 60 db
with response variation of only ±1 db from 10 cps to 250 kc
Price $315.
Relay Rack Version, Model 300G-S2 Price $335.

SPECIFICATIONS
Voltage Range 1 mV—1000 V
Frequency Range 10 cps—250 kc
Accuracy 1% of reading, 250 cps to 20 kc and 1 mV
to 250 V; 2% of reading elsewhere
Input Impedance 2 MΩ shunted by 15 pF or 25 pF
Scales Logarithmic voltage scale from 1·10;
linear decibel scale from 0 to 20
COMPACT, LONG LIFE VTVM Model 300H

10 cps to 1 Mc


Relay Rack Version, Model 300H-S2 Price $270.

SPECIFICATIONS

- Voltage Range: 300 µV to 330 V (30 µV to 300 µV in "SENS x 10" model)
- Frequency Range: 10 cps to 1 Mc
- Accuracy above 300 µV, in % of reading: 2%, 10 cps—700 kc.
- 3%, 700 kc—1 Mc
- Input Impedance: 2 MΩ shunted by 15 pF or 25 pF
- Scales: Logarithmic voltage scale from 3 to 33, linear decibel scale from —10 to +10

OUTDOOR MILITARIZED VTVM Model 300M

Sensitive, sealed, ruggedized

Designed for rugged field use to withstand military shock and vibration tests. Resistant to water, fumes, dust, extremes of temperature and rough handling. Price $420.

SPECIFICATIONS

- Voltage Range: 500 µV — 500 V
- Frequency Range: 10 cps — 500 kc
- Accuracy, % of Reading: 2%, 10 cps—250 kc; 4%, 250 kc—500 kc
- Input Impedance: 2 MΩ shunted by 15 pF or 30 pF
- Scales: Logarithmic voltage scale from 0.48 to 5.0 V; linear dB scale, -4 db to +16 db; 0 db reference is 1 mW into 600 ohms
- Power Supply: 115/230 V, 50-420 cps 38 watts

BATTERY-POWERED VTVM Model 302C

High accuracy, battery operated instrument provides complete freedom from powerline hum and complete isolation from any powerline. Has lower input noise level (less than 10 microvolts) than a comparable transistorized unit. Also eliminates problem of peak overloads that might exceed transistor characteristics. Usable as hum-free amplifier with maximum gain of 60 db, high input impedance. Price $290.

Relay Rack Version, Model 302C-S2 Price $310.

SPECIFICATIONS

- Voltage Range: 100 µV—1000 V
- Frequency Range: 2 cps—150 kc
- Accuracy: 3% of Reading 5 cps—100 kc and 5% elsewhere
- Input Impedance: 2 MΩ shunted by 10 pF or 25 pF
- Noise Level: Less than 10 µV referred to shorted input circuit
- Scales: Logarithmic voltage scale from 1.10; linear decibel scale from 0 to 20

VIDEO VTVM Model 310B

10 cps to 6 Mc

Designed to provide uniformly accurate and precise voltage and dB readings over the entire 5-inch scale. Co-axial connector and binding post signal inputs. Expected calibration life exceeds 3000 hours. May be used as 60 db gain amplifier over total frequency range. Power input, choice 115/230 V, 50-420 cps. Price $395.

Relay Rack Version, Model 310B-S2 Price $315.

SPECIFICATIONS

- Voltage Range: 100 µV — 100 V
- Frequency Range: 30 µV—300 µV in "DET" (Null Detector) mode
- Accuracy in % of Reading, ANY VOLTAGE: 3%, 100 µV—6 Mc; 5%, 10—6 Mc;
- Input Impedance: 2 MΩ shunted by 15 pF or 25 pF
- Scales: Logarithmic voltage, 0.9—11; Linear decibel, 0—20
VIDEO LINEAR SCALE VTM, Model 311
10 cps to 6 Mc
Designed for flat response to 6 Mc, low power consumption, 3000 hours between calibrations. Mirrored 5-inch scale provides true linear readings. Changing tubes at random has negligible effect on accuracy over entire band. Provided with binding posts, convertible to coaxial input for eliminating spurious input signals.
Price $295.
Relay Rack Version, Model 311-S2
Price $315.

SPECIFICATIONS
Voltage Range 1 mV to 320 V full scale, 12 ranges
Frequency Range 10 cps to 6 Mc
Accuracy (f.s.d.l 2% at 10 cps to 2 Mc; 3% at 10 cps to 6 Mc;
Input Impedance 2 MΩ shunted by 15 pF to 25 pF
Scales Linear voltage scales 0 to 1 V, 0 to 3 V
Decibel scale 10 to +2

VIDEO LINEAR SCALE "1%" VTM. Model 311G
Accuracy of 1%, 40 cps to 1 Mc
Hermically sealed resistors used in the attenuator circuit are matched for both resistance and temperature coefficient, providing highest accuracy and long term stability. Also provided with binding posts, convertible to coaxial input for eliminating spurious input signals.
Price $340.
Relay Rack Version, Model 311G-S2
Price $360.

SPECIFICATIONS
Voltage Range 1 mV to 320 V full scale, 12 ranges
Frequency Range 10 cps to 6 Mc
Accuracy (f.s.d.l 1% at 40 cps to 1 Mc;
2% at 20 cps to 2 Mc; 3% at 10 cps to 4 Mc;
5% at 10 cps to 6 Mc;
Input Impedance 2 MΩ shunted by 15 pF to 25 pF
Scales Linear voltage scales 0 to 1 V, 0 to 3 V
Decibel scale 10 to +2

VIDEO WIDEBAND VTM, Model 314A
With high voltage probe, Model 5314
Designed for precise, accurate measurements to 1000 V with Model 5314 probe. Logarithmic scale uniformly accurate over entire 5-inch length. May be used as sensitive indicator to 10 Mc or as a 60 db amplifier ±1 db to 6 Mc. Power input, choice 115/230 V, 50-400 cps.
Price $250.
Relay Rack Version, Model 314A-S2
Price $270.

SPECIFICATIONS
Voltage Range with Model 5314 probe, 1 mV to 1000 V, without probe, 100 V to 100 V
(30 μV to 300 μV in "DET" Null Detector)
Frequency Range 10 cps to 6 Mc
(3 db bandwidth is 3 cps to 11 MHz)
Accuracy in % of reading, ANY VOLTS
2%, 20 cps to 2 Mc; 3%, 10 cps to 4 Mc;
5%, 10 cps to 6 Mc
Input Impedance 10 MΩ shunted by 7.5 pF with probe, 2 MΩ shunted by 25 pF without probe
Scales Logarithmic voltage, 0.9 to 11 V;
Linear decibel, 0 to 20

INFRASONIC FREQUENCY VTM, Model 315
With Cathode Follower Probe, Model 2317A
Exceptionally wide-band instrument embodying a stable multi-loop feedback amplifier which feeds an average-responding rectifier circuit. High impedance cathode follower probe Model 2317A, with a rugged Navigator tube, has a 3-foot connecting cable and provides 390 μV to 3900 μV range.
Price with probe $2317A $495.
Model 3317 60 db attenuator adapter extends cathode follower probe range from 390 μV to 3900 μV.
Price $87.
Relay Rack Version, with probe $2317A Model 317-S2
Price $915.

SPECIFICATIONS
Voltage Range 300 μV to 3900 μV
Frequency Range 10 cps to 1 Mc
Accuracy, % of reading 2% at 0.05 cps to 0.01 Mc;
3% at 0.01 to 0.05 Mc
Input Impedance With probe, 10 MΩ shunted by 7 pF; without probe, 2 MΩ shunted by 5 pF to 24 pF
Amplifier Max gain 60 db max output voltage 2.5 V

WIDE-BAND VTM, Model 317
With Cathode Follower Probe, Model 2317A
Exceptionally wide-band instrument embodying a stable multi-loop feedback amplifier which feeds an average-responding rectifier circuit. High impedance cathode follower probe Model 2317A, with a rugged Navigator tube, has a 3-foot connecting cable and provides 390 μV to 3900 μV range.
Price with probe $2317A $495.
Model 3317 60 db attenuator adapter extends cathode follower probe range from 390 μV to 3900 μV.
Price $87.
Relay Rack Version, with probe $2317A Model 317-S2
Price $915.

SPECIFICATIONS
Voltage Range 300 μV to 3900 μV
Frequency Range 10 cps to 1 Mc
Accuracy, % of reading 2% at 0.05 cps to 0.01 Mc;
3% at 0.01 to 0.05 Mc
Input Impedance With probe, 10 MΩ shunted by 7 pF; without probe, 2 MΩ shunted by 5 pF to 24 pF
Amplifier Max gain 60 db max output voltage 2.5 V
**MICROSECOND PULSE VTVM, Model 305A**

Peak Reading, 5 cps to 500 kc.

Designed to measure peak-to-peak or either positive or negative peak values of repetitive pulses and distorted or non-distorted wave forms. Has 5-inch mirror backed scale for easy reading to high precision.  
*Price $400.*

**SPECIFICATIONS**

- **Voltage Range**: 1 mV—1000 V, p or pp
- **Accuracy and Range**:
  - Sine wave: ±2% from 20 cps to 200 kc; ±4% from 5 cps to 500 kc
  - Pulses: ±3% above 5 μsec and 100 pps; ±5% above 1 μsec and 100 pps; ±5% above 0.5 μsec and 5 pps with correction
- **Input Impedance**: 2 MΩ shunted by 11 pF or 27 pF
- **Scales**:
  - Logarithmic voltage scales, 1—3 and 3—10 V, Linear decibel scale, 0—10

**WIDE BAND, TRUE RMS VTVM, Model 320A**

10 cps to 4 Mc.

With DC output for recording purposes.

One of the most useful of Ballantine instruments: measures true-rms voltage of a wide range of wave forms including noise, pulse, square or sinusoidal, whose peaks may be 5—10 times the measured rms. Can measure voltages below 5 cps. Has dc output proportional to mean square of input ac voltage, for recording purposes. May be used as 90 db amplifier with single-ended or balanced outputs.  
*Price $385.*

**Relay Rack Version, Model 320A-S2**  
*Price $485.*

**SPECIFICATIONS**

- **Voltage Range**:
  - 100 μV to 330 V
  - (As null detector) 10 μV to 100 μV
- **Frequency Range**: 5 cps to 4 Mc
- **Accuracy, in % of reading**:
  - 2% at 20 cps to 2 Mc
  - 5% at 5 Mc
- **Input Impedance**: 10 MΩ shunted by 27 pF
- **Scales**:
  - Logarithmic, 0.95 to 1.3
  - 3.0 to 10.6, decibels, linear, 0—10

**RAP, True RMS Average Peak VTVM, Model 321**

This instrument combines all the features of Model 320A True-rms Voltmeter, plus those of average-reading and peak-reading voltmeters. It is three fine instruments in one.  
*Price $580.*

**SPECIFICATIONS**

- **RMS, AVG. PEAK**
  - **Voltage Range**:
    - 100 μV to 330 V
  - **Frequency Range**: 5 cps to 4 Mc
  - **Accuracy, in % of reading**:
    - 2% at 20 cps to 2 Mc
    - 5% at 5 Mc
  - **Input Impedance**: 10 MΩ shunted by 27 pF
  - **Scales**:
    - Logarithmic, 0.95 to 1.3
    - 3.0 to 10.6, decibels, linear, 0—10

**HIGH RESOLUTION UHF MILLIVOLTOMETER, Model 340**

True-RMS, 300 μV to 3 V.

Designed to measure true-rms regardless of voltage or waveform of source. Logarithmic 5-inch scale provides the same high resolution and accuracy throughout the scale. DC output available for application to a recorder.  
*Price $780.*

**SPECIFICATIONS**

- **Voltage Range**:
  - 300 μV to 3 V
- **Frequency Range**: 0.1 Mc to > 700 Mc
- **Accuracy, in % of reading**:
  - 2% at 0.1 Mc to > 1 Mc
  - 3% at > 1 Mc to > 10 Mc
  - 5% at > 10 Mc to > 70 Mc
- **Crest Factor**: 10 to 3 depending on voltage range

**Mean Square DC Output**

- 0.1 to 1.0 Mc

**Mean Resistance**

- 20 kΩ for applications to dc recorder
**DCIAC VOLTMETER-OHMETER.**

**Model 345**

- **With built-in voltage reference**
  - Five inch logarithmic scale for dc or ac voltages and for resistance provides uniform accuracy and resolution over the entire scale as "percent of actual reading." Has built-in dc voltage reference of 0.1 V, 1.0 V, and 5.0 V.
  
  **SPECIFICATIONS**
  - DC Voltage Range: 0—1100 V
  - AC Voltage Range: 0—350 V to 3000 V with optional accessory
  - Ohms Range: 0.025/1 to 5000 MΩ
  - Frequency Range: 20 cps to 1000 Mc
  - Accuracy % of reading: dc: 1%; 1 V—1100 V; ac: 2%; 1 V—350 V; 50 cps—100 Mc; ohms: 3%; 1—100 MΩ
  - Input Impedance: dc, 112 MHz; ac, 10 MΩ; 1.2 pf
  - Power Requirements: 115 / 230 V, 60 cps, 25 W; 50 cps units on special order.
  - Dimensions (inches): 7.5W x 6½H x 9¾D ½ rack modular case
  
  Specifications are considerably amplified in a technical bulletin which will be sent on request.

**DC-AC DIGITAL VOLTMETER**

**Model 350**

- **Highest Accuracy True-RMS**
  - 0.1 V to 1199.9 V
  - Frequency Range: 50 cps to 20 kc
  - Accuracy: ±% of reading, 100 cps to 10 kc; 0.1 V to 300 V; ±% of reading outside these limits
  - Max Crest Factor: 2
  - Input Impedance: 2 MHz shunted by 15 pf to 45 pf

- **With digital readout**
  - Rugged, reliable, ¼% accurate, true rms-responding instrument that can be used to calibrate other vtvm's. Uses bridge-type method of measurement: four knobs are set for minimum indication; the unknown voltage is read directly from a NIXIE in-line read-out. Precision exceeds stated accuracy by 5 to 10 times.

  **Price**: $720.

  **Relay Rack Version, Model 350-S2**
  - Price: $740.

  **SPECIFICATIONS**
  - Voltage Range: 0.1 V to 1199.9 V
  - Frequency Range: 50 cps to 20 kc
  - Accuracy: ±% of reading, 100 cps to 10 kc; 0.1 V to 300 V; ±% of reading outside these limits
  - Max Crest Factor: 2
  - Input Impedance: 2 MHz shunted by 15 pf to 45 pf

  This space reserved for
  - Model 355 DC-AC Digital Voltmeter
  - Availability: Summer 1965
  - Price: $990.

  Technical data sheet on request

1 μV to 1000 V and 0.001 μA to 1 A

- Capable of precision measurements of dc voltage and current over the widest range possible with any available instrument.

  - Logarithmic scale provides identical resolution and accuracy throughout the scale.
  - Equipped with a built-in calibrator.

  **PARTIAL SPECIFICATIONS**
  - Voltage Range: 1 μV to 1000 V
  - Current Range: 0.001 μA to 1 A
  - Accuracy, over most ranges: 1% of reading as voltmeter; 2% as ammeter (Equivalent to better than ½ % f.s.d. and better than 1% of f.s.d. respectively over the lower half of the scale.)

  **Relay Rack Version, Model 365-S2**
  - Price: $860.

  **Relay Rack Version, Model 365-S2**
  - Price: $670.

  **PARTIAL SPECIFICATIONS**
  - Voltage Range: 1 μV to 1000 V
  - Current Range: 0.001 μA to 1 A
  - Accuracy, over most ranges: 1% of reading as voltmeter; 2% as ammeter. Equivalent to better than ½% f.s.d. and better than 1% of f.s.d. respectively over the lower half of the scale.

  **DC Amplifier**
  - Up to 100 db. DC output 0.1 V to 1.0 V for each decade from a source resistance of 1667 ohms. Suitable for direct application to dc digital vm for reading very low voltages or currents.
Accurate

Provides an accurate high stability output at any desired voltage from 0 to 10 volts whether rms of pure 1000 cps signal, peak-to-peak of the same signal, or dc. Its output can be connected to a vtm or an oscilloscope for direct reading.

Price $395.

**Relay Rack Version, Model 420-S2**

Price $415.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Voltage Range</th>
<th>0—10 V rms, peak-to-peak, or dc</th>
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<tr>
<td>Frequency</td>
<td>1 kc</td>
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<td>Accuracy (with cal. chart)</td>
<td>0.25%</td>
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<tr>
<td>Accuracy (without cal. chart)</td>
<td>Better than 0.5%</td>
</tr>
<tr>
<td>Distortion and Hum</td>
<td>Less than 0.25%</td>
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<td>Setting Resolution</td>
<td>Approaches 0.01% above 10 mV</td>
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<td>AC Output Impedance</td>
<td>2—20k depending on range setting</td>
</tr>
<tr>
<td>DC Output Impedance</td>
<td>0—4000 depending on dial setting</td>
</tr>
</tbody>
</table>

**With digital in-line readout of output**

Provides dc and two ac voltage output frequencies, 0.15% accuracy, and an in-line digital presentation of output voltage. Stabilized against wide variations in ambient temperature and line voltage variations. May be installed in a major system to check a wide range of voltage sensitive instruments.

Price $690.

**Relay Rack Version, Model 421-S2**

Price $620.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Voltage Range</th>
<th>0 to 111 V rms, p-p, or dc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequencies</td>
<td>400 cps, 1000 cps, dc</td>
</tr>
<tr>
<td>Accuracy of output EMF</td>
<td>0.15% all modes, all ranges</td>
</tr>
<tr>
<td>Stability</td>
<td>Line Voltage 10% from 15V/20 V, 0.05%</td>
</tr>
<tr>
<td></td>
<td>Temperature 25°C±10°C, 0.005°F/°C</td>
</tr>
<tr>
<td></td>
<td>Short time (1-hour) 0.01% Calibration period 1000 hrs.</td>
</tr>
<tr>
<td>Distortion hum and noise</td>
<td>Less than 0.1%</td>
</tr>
<tr>
<td>Source Resistance</td>
<td>AC Output 0.2—40 Ω</td>
</tr>
<tr>
<td></td>
<td>DC Output 0.1—1000 Ω</td>
</tr>
</tbody>
</table>

**Direct reading, 0.01 picofarads to 12 microfarads**

Provides rapid, direct, accurate measurements over a wide range of capacitance. Features mirror-backed logarithmic scale meter, adjustable go-no-go pointers, high stability, internal calibration. Includes a set of three test adapters. Ideal for laboratory and inspection department use.

Price $425.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Capacitance Range</th>
<th>0.01 pF to 12 µF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy, as % of reading</td>
<td>2% from 0.1 pF to 12 µF and 5% from 0.01 pF to 0.1 pF</td>
</tr>
<tr>
<td>Test Frequency</td>
<td>1 kc</td>
</tr>
<tr>
<td>Meter</td>
<td>Logarithmic, reading from 1 to 12</td>
</tr>
<tr>
<td>Maximum Capacitance Dissipation Factor</td>
<td>0.05</td>
</tr>
</tbody>
</table>

**30 cps to 250 kc**

Will make your existing dc instruments such as Digital Voltmeters, Type K Potentiometers and DC Recorders useful for ac measurements accurate to 1/4 % (see specs). Output is 0.1 V to 1.0 V linearly over each of six decades of ac input. Instrument is average-responding type for distortions as much as 30%. Portable Version Price $810.

**Relay Rack Version, Model 710-S2, as shown**

Price $850.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Voltage Range</th>
<th>1 mV to 1000 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range</td>
<td>30 cps—250 kc</td>
</tr>
<tr>
<td>Accuracy</td>
<td>0.25%, 50 cps—10 kc; 0.5%, 30—50 cps; 1%, above 50 kc</td>
</tr>
<tr>
<td>Output Source Impedance</td>
<td>10,000 Ω</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>2 MΩ shunted by 15 pF to 25 pF</td>
</tr>
</tbody>
</table>
A-T VOLTMETER (Attenuator-Thermocouple), Model 390
10 Mc to 1000 Mc, 0.5 V to 300 V
A laboratory reference standard designed for calibration of ac voltmeters above 0.5 volt, at frequencies from 10 Mc to 1000 Mc. Consists of a stable, adjustable waveguide-below-cut-off attenuator feeding a UHF thermocouple. Micrometer setting for standard dc output of the thermocouple is determined by NBS calibration for various frequencies and voltages. Calibration by NBS is required, but not included in the price. Design is based on that of Myron C. Selby and L. F. Behrent of NBS. Price $2250.

HF TRANSFER VOLTMETER, Model 393
25 cps to 30 Mc, 1 V to 100 V
An accurate instrument by means of which an unknown ac voltage may be measured in terms of an accurately measurable dc voltage. Used to calibrate ac voltmeters and sources of ac, or to measure frequency response of devices at frequencies up to 30 Mc. Has a range from 1 volt to 100 volts covered by six probes. Design is based on one by F. L. Hermach of the National Bureau of Standards and is known as the "Type C Transfer Standard." Price $1270 (with 6 probes). Price of each probe $120.

MICROPOTentiOMETER, Model 440
0 to 900 Mc, 15 μV to 1 V
Designed as a low impedance source of accurately known voltage at frequencies from 0 to 900 Mc. Consists of a UHF thermocouple in series with a special radial resistor. When connected to an external signal source, the voltage drop across the resistor can be held to a known value over the entire range of frequencies by monitoring the dc output of the thermocouple. Each thermocouple-resistor combination can be operated over a voltage range of 4 to 1 selected between the limits of 15 microvolts and 1 volt. Ideal for calibration of ac voltmeters and oscilloscopes. Calibration to 500 Mc is included in the price. Based on designs by Myron C. Selby of the NBS. Model 440, with one radial resistor and one thermocouple housing. Price $250. Additional Radial Resistors Price $175 each Additional Thermocouple Housings Price $75 each

RACK VERSIONS:
The suffix S2 after any model number indicates a 19" rack version. All Ballantine Instruments are available in standard Ballantine gray, or to meet your own color specification at slightly higher prices than those shown. Model 320A-S2 is illustrated.

SPECIAL SCALE VERSIONS:
Different scales may be ordered as special versions of models 300H, 300G, 310B, 314A and 317. The scales are available with the decibel scale as the top scale; or where 0 db is referenced as 1 mW into 600Ω (0.774 V). For complete information on special scales send for descriptive literature.
MANY ACCESSORIES ARE AVAILABLE TO INCREASE THE VERSATILITY OF BALLANTINE VTVM'S. SEND FOR DESCRIPTIVE BROCHURES.

VOLTAGE MULTIPLIERS — Series 1300 Voltage Multipliers are compensated attenuator assemblies that plug into the input terminals of vtvm's. These increase the voltage range of Ballantine Voltmeter Models 300, 302B, 302C, 310A, 314, and 320 up to 10,000 volts, and the input impedance to as high as 40 megohms. Price: $55 each

HIGH VOLTAGE PROBES — Model 1301 High Voltage Probe is a 10,000 to 1 capacitive attenuator designed for measurements of voltages up to 10,000 rms or 28,000 peak to peak when connected to the binding post input of any Ballantine vtvm's. Price: $62

Model 1311 is a probe similar to Model 1301 designed to connect into the co-axial input receptacle of Ballantine Models 310B, 311, 314A, 317, and 320A. Price: $62

Model 5314 Probe is normally supplied with Model 314A Voltmeter. It is a 10 megohm probe with 20 db attenuation making possible accurate measurements from 1 mV to 1000 V when connected to Model 314A. Price: $62

CATHODE FOLLOWER PROBE — Model 2317A Cathode Follower Probe is normally supplied with Model 317 volt- meter for measurements from 300 mV to 300 mV. Its input impedance is equivalent to 10 megohms shunted by 7 pF. Length of cable is 3 feet. (To measure higher voltages use Model 3317 Adapter, see below). Price: $87

PRECISION SHUNT RESISTORS — Series 600 Precision Shunt Resistors having values of 0.01, 0.1, 1.0, 10, 100, 1000 ohms may be connected across the binding post input terminals of Ballantine vtvm's for measurement of current from 0.1 microamperes to 10 amperes.

Price each: 1, 10, 100, 1000 ohms: $20.
0.1 ohms: $25.
0.01 ohms: $35.

ADAPTERS — Model 617 Adapter is a single binding post to single banana plug adapter which may be plugged into the UHF co-axial receptacle on Ballantine Models 310B, 314A, 320A vtvm's to provide a binding post instead of a co-axial input connection.

Price: $15

Model 2314 Adapter is a UHF co-axial to twin binding post adapter which may be connected into the UHF co-axial receptacle on Ballantine Model 314 vtvm to provide a twin binding post input connection.

Price: $15

Model 3317 Adapter is a 60 db attenuator attachment for use on the Model 2317A Cathode Follower Probe to extend the range of voltage measurements of the Model 317 Voltmeter. Voltage range with Model 3317 Adapter is 300 mV to 300 V.

Price: $37.
A Few of the Many Sales Engineers Who Represent Ballantine

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BALLANTINE LABORATORIES INC.

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