

... a separate scale for every range—  
rotated into position automatically  
as the range is selected.....

# Simpson Koto Ranger

## Model 221

### HIGH SENSITIVITY A.C. - D.C. VOLT-OHM-MILLIAMMETER



Actual size of  
Roto Ranger is 12 3/4" x 10" x 5 3/8"

Roto Ranger gives you these two important advantages over multi-scale instruments:  
1. Errors in calculation and reading become almost impossible.  
2. You get accurate readings three to five times faster than you can get them from the condensed scales of a multi-scale instrument.

Roto Ranger provides a separate, direct-reading scale for each range, and does it automatically. As the selector switch is moved to the range desired, an ingenious mechanism brings into place behind the meter window the proper scale for that range. (The mechanism is described in detail below.)

Consider the steps you must take to get readings on a multi-scale tester. First you must set the range and circuit selector switch. Next, after making connections for the test you must locate the proper arc on the scale, take a reading, and, in most cases, divide or multiply to get the proper answer. On Roto Ranger you simply select the range, connect, and read!

For research and experimental work where correct readings quickly obtained are essential; for critical industrial applications where reading errors may result in costly material spoilage or serious production errors; for the radio, television, radar, and x-ray technician who must "trouble-shoot" speedily and without error—Roto Ranger is a modern and final answer. It is Simpson-patented, exclusive with Simpson.

Here is the equivalent of 25 separate instruments combined in one sturdy and compact unit. (18 scales; 7 additional circuit-reading ranges through the use of high voltage and output jacks.) There are no cramped calibrations. The large 5 1/2" meter permits full sized scales, each designed as it would be for a separate instrument.

The time saving and the protection against reading mistakes provided by the Roto Ranger mean steady dollar saving for servicemen, engineers and industrial users. A study of the descriptions below will show you that the Roto Ranger mechanism is built to the same high standards of quality materials and construction, and with the same engineering originality that has earned for the famous Simpson movement worldwide acceptance as outstanding in its ability to stay accurate.

## Inside the Roto Ranger.....

We are going to detail here the construction and engineering of the Roto Ranger so that you may understand the unparalleled value that is built into this, as into all, Simpson instruments. Here is not merely an invention of significance to all users of multi-range instruments, here are construction design and construction engineering that carry that idea into faultless functioning. You will see that, at point after point, cheaper and less painstaking construction could have been employed. But such construction would be at the expense of maximum strength. It would be at the expense of simple, uncomplicated mechanism that eliminates breakdowns. It would be at the expense of that lasting accuracy that is fundamental to every instrument bearing the Simpson name. Here is a sound idea, soundly engineered and soundly constructed, to give you something you cannot buy elsewhere, and at maximum value for your invested dollars.

**1 The Multi-Scale Rotor:** The 18 separate scales are here mounted on the rotor which, as it turns, brings one of the scales behind the movement's pointer. The easy way to construct this rotor would be to fasten the separate scales to the surface of the drum. This is not the Simpson way. We mold the rotor unit of bakelite in one piece. Its surface is made up of 18 separate slotted recesses. The dovetail design permits a very close fit between the metal scale and the edges of the recess. This means that each scale is locked in place, top and bottom, throughout its whole length. It can never warp or buckle. It cannot get out of place. Calibration remains always 100% accurate. The molding of this bakelite rotor is, incidentally, a good example of why Simpson bakelite parts are molded in our own plants. The demands we make in accuracy of molding, control of shrinkage, and other factors necessary to produce our designs are so great that it is not feasible for conventional plastic molders to produce them. This is another point of quality control at Simpson that is unique in the test instrument business. Scales are also Simpson manufactured.

**2 What the Rotor Does—The 3-Point Ball-and-Spring Positioners.** The outstanding and exclusive feature of the Roto Ranger, Simpson-patented, is this: once the instrument pointer is calibrated to zero of a particular scale, it will fall with unvarying accuracy on zero of any other scale rotated into position behind it. Likewise, the range selector switch mechanism seats itself into position with its contacts with absolute and unchanging accuracy when the

switch is moved to the range chosen. Both these things are made possible by two ball-and-spring positioners working independently of each other.

To see how these positioners work, let's examine the positioner on the multi-scale rotor. On the end of the rotor drum, a scalloped wheel is molded as an integral part of the rotor. Each scallop is thus perfectly aligned with the scale positions. Each scallop is recessed to the capacity of a ball bearing 3/16" in diameter.

Into these scallops, at three positions on the wheel, ball bearings are held under pressure of individual springs which are inserted into a surrounding bakelite cover. This cover is, in turn, accurately and firmly positioned by being molded as a part of the end plate which provides one of the rotor bearings. The placing of these ball-and-spring assemblies at three points on the rotor assures balanced pressure over the entire circumference and results in secure locking at each scale position. Yet the rotor smoothly repositions to each new range scale selected.

The far end of the rotor housing contains a thrust bearing to hold the rotor in position so that it will always rotate in the same plane. The near end of the rotor is a coupling plate. This plate is slotted in three places to receive three corresponding teeth of the face plate of the flexible coupling assembly. As you can see, while the rotor is turned by the range selector switch, this flexible coupling plus the ball-and-spring positioner, permits the rotor to position itself independently of the switch rotation. This means that no scale can appear behind the pointer in any position except the exact spot for perfect calibration with the pointer, and only one scale can show behind the pointer at one time.

The second of these positioners is on the range selector and likewise assures that switch contacts snap into and are secured at the exact point at which contacts are perfectly closed on the circuit for the range selected.

As you can now see, both the Multi-Scale Rotor and the Range Switch are driven by the turning of the range selector. As the range is selected, the switch positioner seats the switch contacts properly. The drive is simultaneously transmitted to the scale rotor through a pair of mitre gears. These gears, incidentally, are accurately set with gauges. Gears are locked to the shafts with pins which go through the entire diameter of the shafts and are upset at each end to lock them in place.

**3 Bearings—**the wide separation of the two bearings prevents the shaft from binding and gives smooth action. The thrust bearing eliminates wear and assures long life.

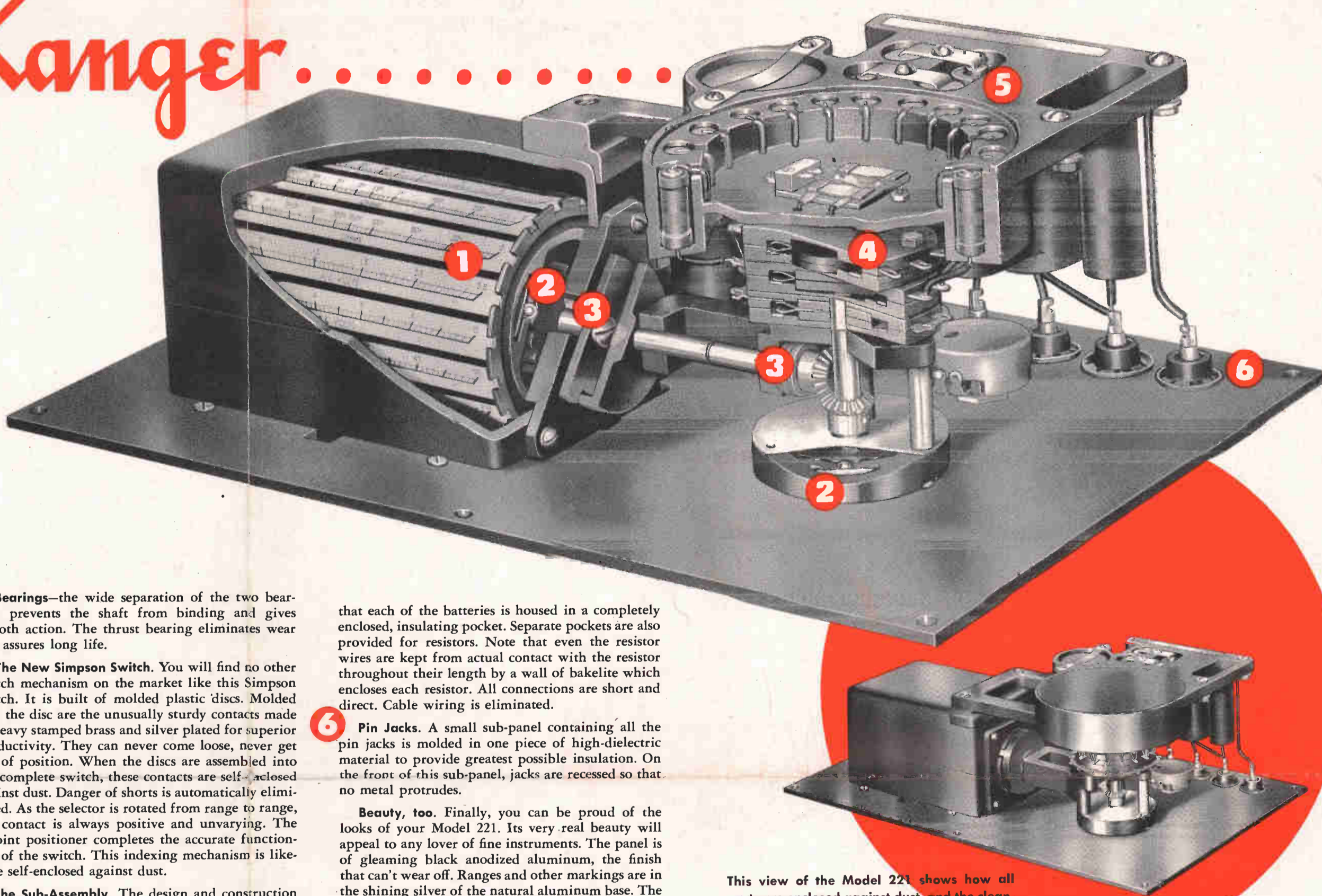
**4 The New Simpson Switch.** You will find no other switch mechanism on the market like this Simpson switch. It is built of molded plastic discs. Molded into the disc are the unusually sturdy contacts made of heavy stamped brass and silver plated for superior conductivity. They can never come loose, never get out of position. When the discs are assembled into the complete switch, these contacts are self-enclosed against dust. Danger of shorts is automatically eliminated. As the selector is rotated from range to range, the contact is always positive and unvarying. The 3-point positioner completes the accurate functioning of the switch. This indexing mechanism is likewise self-enclosed against dust.

**5 The Sub-Assembly.** The design and construction of the sub-panel is truly remarkable for its strength, highest possible accessibility of components, and maximum insulation against shorts. You will note

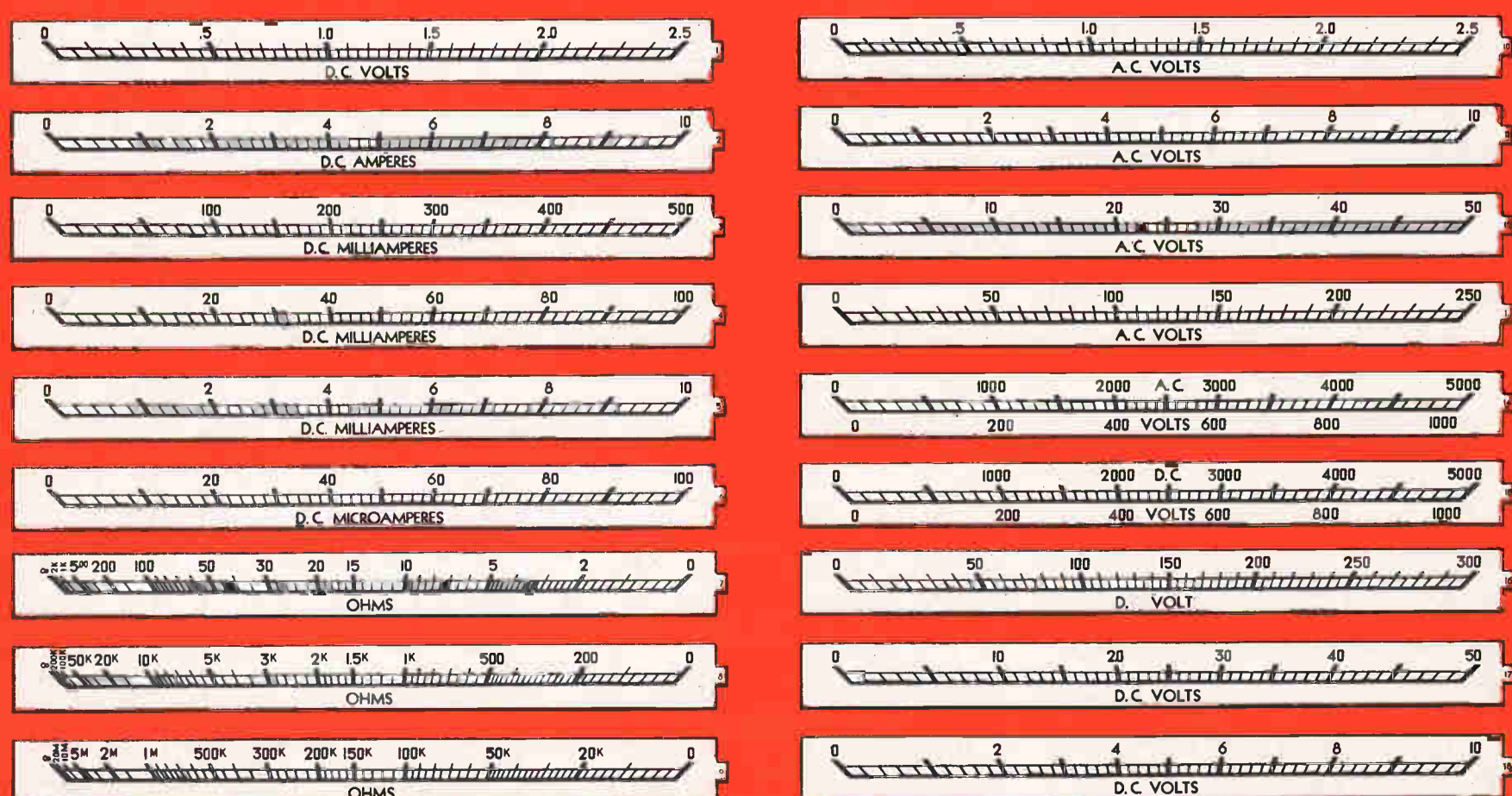
that each of the batteries is housed in a completely enclosed, insulating pocket. Separate pockets are also provided for resistors. Note that even the resistor wires are kept from actual contact with the resistor throughout their length by a wall of bakelite which encloses each resistor. All connections are short and direct. Cable wiring is eliminated.

**6 Pin Jacks.** A small sub-panel containing all the pin jacks is molded in one piece of high-dielectric material to provide greatest possible insulation. On the front of this sub-panel, jacks are recessed so that no metal protrudes.

**Beauty, too.** Finally, you can be proud of the looks of your Model 221. Its very real beauty will appeal to any lover of fine instruments. The panel is of gleaming black anodized aluminum, the finish that can't wear off. Ranges and other markings are in the shining silver of the natural aluminum base. The case is of finest wood construction, leatherette covered, with sturdy handle of black bakelite. Cover has slip hinges for quick removal.



This view of the Model 221 shows how all parts are enclosed against dust, and the clean-cut design of the chassis. Rotor mechanism and circuit sub-assembly are individually removable from the panel.



#### Ranges

20,000 Ohms per Volt, D. C., 1,000 Ohms per Volt A. C.  
Volts, A. C.: 2.5, 10, 50, 250, 1000, 5000  
Volts, D. C.: 2.5, 10, 50, 300, 1000, 5000  
Milliamperes, D. C.: 10, 100, 500  
Microamperes, D. C.: 100  
Amperes, D. C.: 10  
Output: 2.5, 10, 50, 250, 1000  
Ohms: 0-2000 (12 ohms center), 0-200,000 (1200 ohms center), 0-20 megohms (120,000 ohms center).  
Size: 12 3/4" x 10 1/8" x 5 3/8"  
Weight: 8 lbs. 9 oz.  
Price, complete with test leads and 28-Page Operator's Manual... \$69.85

#### THE FAMOUS SIMPSON MOVEMENT

The heart of the Model 221 is, of course, the renowned Simpson movement, and this movement is the result of forty years' experience in quality instrument design and construction. It is the Simpson-patented version of the famed D'Arsonval full bridge type movement with soft-iron pole pieces. The important function of soft-iron pole pieces is to redistribute the irregular magnetic flux throughout the air gap. Only in this way can instruments using the same printed scale be built in production at moderate cost and yet be accurate. In the Simpson movement, these soft-iron pole pieces also serve to anchor each bridge securely, at top and bottom, in two positions—thus providing a rigid frame that holds the moving assembly always in proper alignment, for permanent accuracy.

#### HIGH TORQUE-TO-WEIGHT RATIO

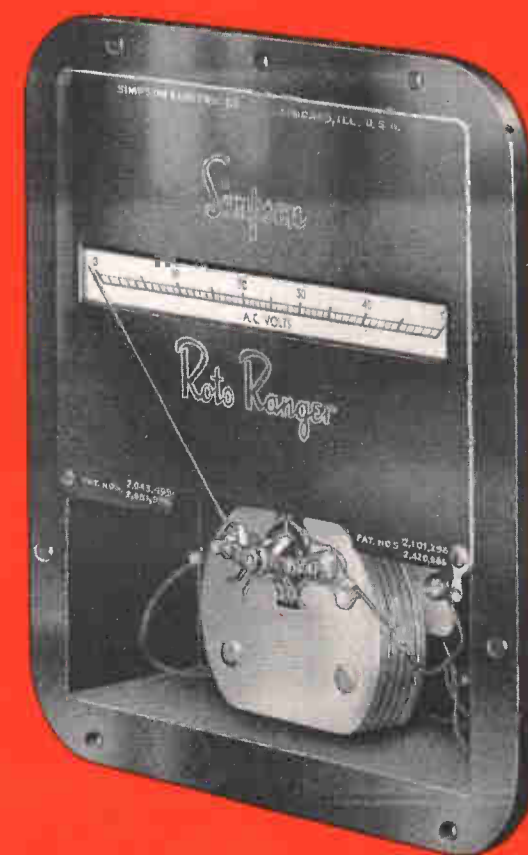
The torque to weight ratio, an important index of instrument merit, is extremely high in the Simpson movement. Friction has been reduced to a negligible factor. Pivots are completely Simpson-made, rounded on ends in true spherical form—no sharp points to break off easily. Carefully controlled heat-treating makes them hard and tough to withstand jars and shocks throughout a long life. Polished to a mirror finish, the pivots are seated in the very finest jewels obtainable. Springs are carefully selected and tempered, and then tested for permanent resiliency.

#### HEAT-TREATED ALNICO MAGNET

The Model 221 uses an Alnico alloy magnet proved by exhaustive tests to be most suitable for the high sensitivity requirements of this instrument. All magnets are heat-treated for permanence and further aged to make sure this long life has been secured.

#### THE SIMPSON DIAL

Like all Simpson dials, the Model 221 is processed in the Simpson plant by exclusive methods developed by Simpson engineers. These methods insure perfect registration of colors. No finer dials are commercially available.



# The modern answer to TV, FM and AM Servicing

## MODEL 260 VOLT-OHM-MILLIAMMETER

There's good reason why this is the world's most popular high sensitivity volt-ohm-milliammeter. In every part, from smallest component to overall design, no competing instrument can show superiority. It outsells because it outranks every similar instrument. And in the exclusive Simpson patented Roll Top safety case, shown here, you have constant, important protection for your Model 260. A flick of the finger opens or closes it. (See diagram below.)

### RANGES

20,000 Ohms per Volt D.C., 1,000 Ohms per Volt A.C.  
Volts: A.C. and D.C.: 2.5, 10, 50, 250, 1000, 5,000.  
Output: 2.5, 10, 50, 250, 1000.  
Milliamperes, D.C.: 10, 100, 500.  
Microamperes, D.C.: 100.  
Amperes, D.C.: 10.  
Decibels (5 ranges): -10 to +52 D.B.  
Ohms: 0-2000 (12 ohms center), 0-200,000 (1200 ohms center),  
0-20 megohms (120,000 ohms center).  
Model 260, Size: 5 1/4" x 7" x 3 1/8" ..... **\$38.95**  
Model 260 in Roll Top Safety Case, as shown.  
Size: 5 3/8" x 9" x 4 3/4" ..... **\$45.95**  
Both complete with test leads and 32-page Operator's Manual.



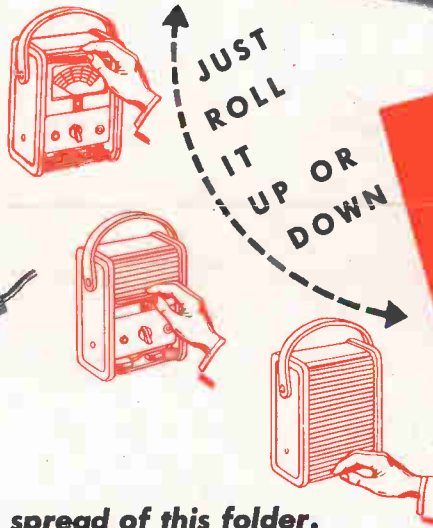
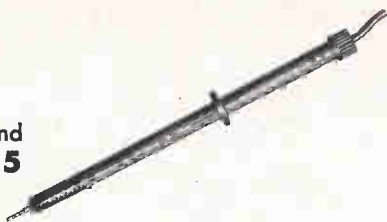
### Sub-Panel Assembly—Strong, Simple, Accessible

The ruggedness, the simplicity of design, and the consequent accessibility of components are shown here. Molded of sturdiest bakelite, the sub-panel provides separate pockets for resistors. This separation makes for orderly assembly, highest possible accessibility, and added insulation for preventing shorts. All connections are short and direct. Cable wiring is eliminated. Each battery has its own compartment, again increasing accessibility.



with cover over resistor pockets removed to show design.

High voltage probe (25,000 volts) for TV, radar, x-ray and other high voltage tests. .... **\$12.85**



JUST ROLL IT UP OR DOWN

**No value equal to it...**  
... in staying accuracy  
... in functional design  
... in useful ranges  
... in sensitivity  
... in ruggedness  
... in precision

For description of the new Simpson Switch Mechanism, see inside spread of this folder.

## MODEL 266 VACUUM TUBE VOLTMETER

Extreme accuracy—the keynote of modern electronic engineering—is provided by the new Simpson Model 266 throughout its entire range.

Packed full of important features, this typically fine Simpson instrument offers, for example, a 1 volt range for the full scale deflection necessary in measuring low R.F. voltages, a zero center switch embracing all D.C. voltage ranges for discriminator circuit alignment and a special probe with a low input capacitance of approximately 4 micro-microfarads for work on R.F. voltages.

D.C. volt input resistance ranges from 50 to 200 megohms; A.C. volt input impedance at 60 cycles is approximately 10 megohms. Primary of the power transformer is well-regulated, holding close control over filament as well as plate voltage, and the D.C. input circuit is filtered so the pressure of superimposed alternating currents does not affect D.C. measurements.

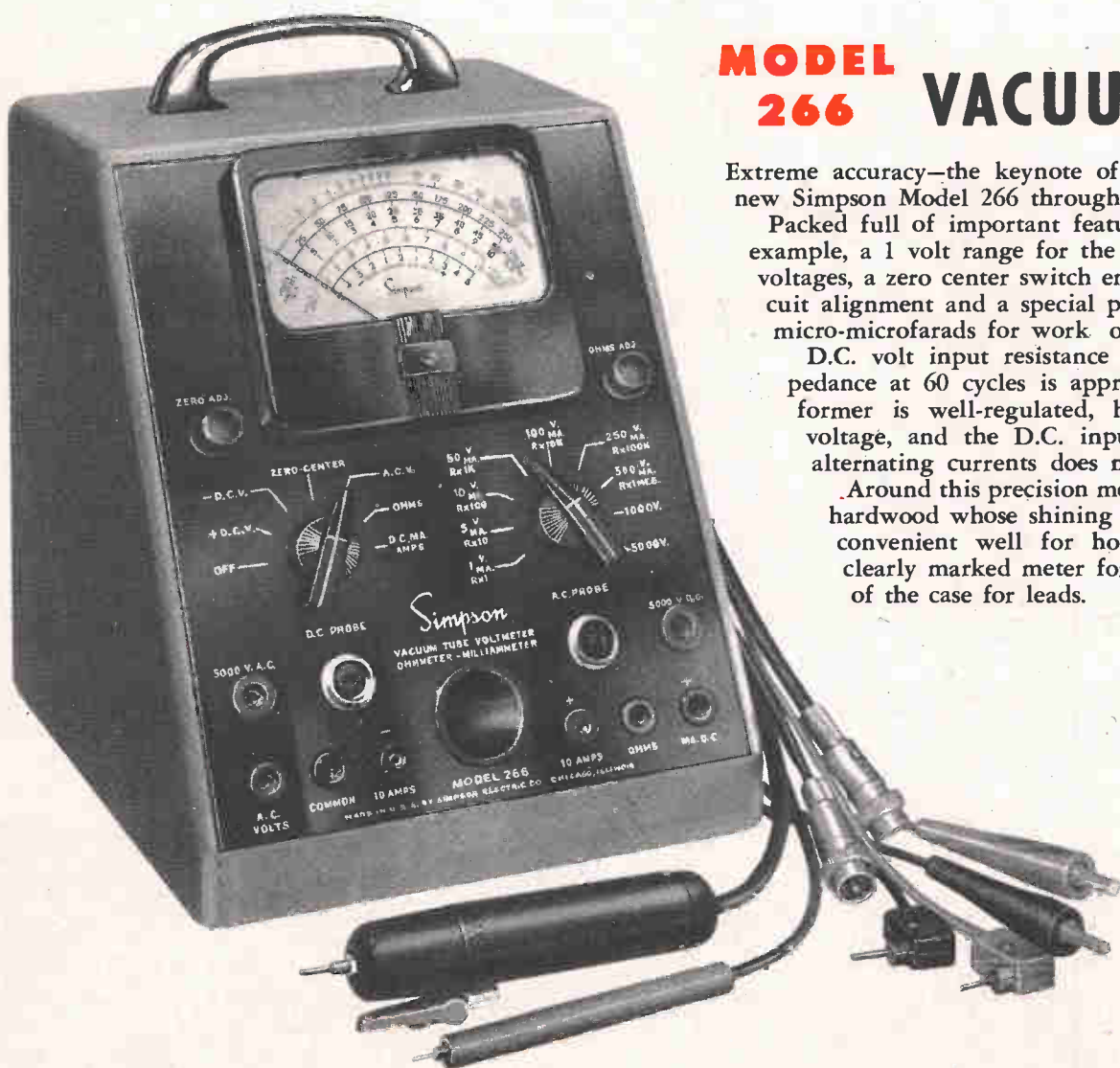
Around this precision mechanism, Simpson has built a sturdy case of attractive hardwood whose shining silver and black anodized aluminum panel provides a convenient well for holding the A.C. probe. In addition, there is a large, clearly marked meter for quick, easy readings, and a compartment in the rear of the case for leads.

### RANGES

Volts: (A.C. and D.C.) 0-1, 5, 10, 50, 100, 250, 500, 1000, 5000  
Milliamperes, D.C.: 0-1, 5, 10, 50, 100, 250, 500  
Amperes, D.C.: 0-10  
Ohms: 0-100 (10 ohms center)  
0-10,000 (100 ohms center)  
0-100,000 (1000 ohms center)  
0-1 megohm (10,000 ohms center)  
0-10 megohms (100,000 ohms center)  
0-100 megohms (1 megohm center)  
0-1000 megohms (10 megohms center)

Size: 8 1/2" x 9 1/2" x 8"

Dealer's Net Price ..... **\$94.50**  
Complete with leads and 32 page Operator's Manual



# Simpson

INSTRUMENTS THAT STAY ACCURATE

SIMPSON ELECTRIC COMPANY  
5200-5218 West Kinzie Street, Chicago 44, Illinois  
In Canada: Bach-Simpson, Ltd., London, Ont.



FROM

Sound Equipment      Electronic Devices

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409 LUMBER EXCHANGE      MINNEAPOLIS 1, MINN.

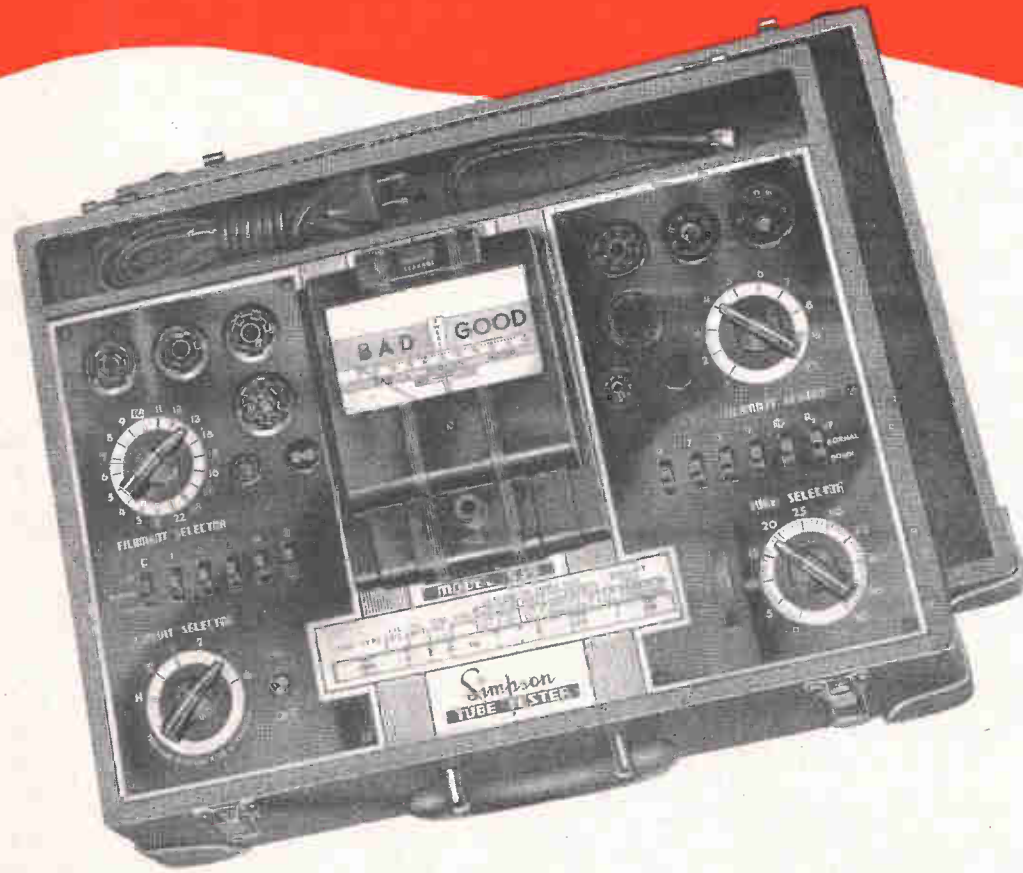
Electrical Eng. Dept.  
Hamline University  
St. Paul, Minn.

POSTMASTER: CONTS - MDSE - RETURN POSTAGE GUARANTEED *First-Class* PHILA. THIS PARCEL MAY BE OPENED FOR POSTAL INSPECTION IF NECESSARY.

**IT WILL PAY** you to realize and act on one significant fact about test equipment: your only protection against loss of reputation through errors in your work is to purchase test equipment from a manufacturer who believes in quality first, last, and always; who exhibits real and constant engineering originality; who never brings a product to market unless that product is, in its price range, the best that can be produced.

Because that has always been and will always be the Simpson creed, you can be sure of the protection your work demands by concentrating on Simpson test equipment.

# Simpson Engineered To Bring You Latest Electronic Advancements and Protection Against Obsolescence . . . . .



## MODEL 555 TUBE TESTER with Simpson "No-Backlash" Roll Chart

Distinguished by its simplicity of operation and attractive appearance, the Model 555 offers a 5 inch, modern-design, illuminated meter for quick readings. A jewel-like Lucite block above the dial opening houses the neon tube for indication of shorts and interelement leakages. Another feature is the projection of the line adjustment control through the meter cover just below the dial opening for ease in observation and adjustment of line voltage.

Using the basic RMA recommended circuit, it is possible to test any tube regardless of its base connections or the internal connections of its elements through the use of the new exclusive Simpson three-position lever-operated toggle switches. These switches use a molded rotor carrying silver plated contacts which are self-cleaning through their wiping action.

The Model 555 will test all receiving tubes, including the latest nine pin miniature tubes and the subminiatures as used in hearing aids, etc. Extra sockets are provided and the flexible individual element switching arrangement takes care of future tube developments. Tests can also be made on gaseous rectifiers, pilot lamps, and continuity of ballast tubes.

The panel of Model 555 is distinguished by beautiful modern styling in the shining silver and black of highly polished, enduring, anodized aluminum.

Size: 16 1/4" wide x 12 1/2" high x 6" deep.  
Dealer's Net Price, complete with Operator's Manual. . . . . \$69.85

## MODEL 415-A SIGNAL GENERATOR

In the new Model 415-A you have a wide range signal generator designed to provide the highest standard of accuracy, lasting stability, and exceptionally low leakage—characteristics usually found only in instruments of laboratory quality. The Model 415-A incorporates a built-in sweep circuit that is the answer to modern FM servicing. It provides a frequency modulated signal with sweep up to 1 megacycle, which is more than adequate for all FM alignment. It is internally modulated at either 60 cycles or 400 cycles or modulated from an external source. In addition, a 120 cycle saw-tooth voltage is available for use as scope synchronization or as the actual scope sweep. The AM bands of Model 415-A cover a complete frequency range from 75 KC to 130 MC. FM bands cover the range between 2 MC and 115 MC. RF output is controlled through the entire range to eliminate the necessity of a separate connection for high uncontrolled output as found in other signal generators. AM modulation is from 0 to 100% using either the 400 cycle internal sine wave or an external source. A range from 0 to over 9 volts of 400 cycle sine wave is available for external use. The panel is of beautiful black-and-silver, enduring, anodized aluminum.

**RANGES:**  
For 105-130 volts, 50-60 cycles  
KC.: 75-200; 200-600; 550-1800  
MC.: 1.7-5.2; 5-16.5; 16-32; 31-65; 62-130  
Size: 5 1/2" x 11 1/2" x 15 1/8"  
Dealer's Net Price, complete with Operator's Manual. . . . . \$145.00



Fundamentals to 65 MC.

**\*One Button** clears every switch setting...ready for the next tube test

The Simpson Automatic Reset is just another of the practical refinements that make Simpson tube testers serve you better than other testers. When you finish a test, just press the Automatic Reset button and instantly all switches, both push button and rotary, return to normal. This not only saves time but prevents error due to previous settings being left in position at the beginning of the new test. The Reset mechanism, in whose design and tooling many thousands of dollars have been invested, is Simpson patented. No other switch control mechanism is so completely automatic.

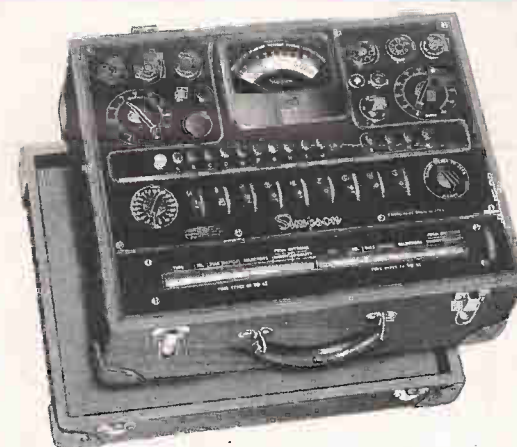
\*The Automatic Reset is featured on Models 330, 335 and 445.

## MODEL 445 Tube and Set Tester



This set combines the Model 335 Plate Conductance Tube Tester (at right) with a 20,000 ohms per volt D.C. Set Tester. This volt-ohm-milliammeter provides the ranges that have made Simpson Model 260 the most famous set tester in the world. Model 445 has "No Backlash" Roll Chart.

**RANGES:**  
Volts (20,000 ohms per volt D.C., 1000 ohms Output: A.C. volts: 2.5, 10, 50, 250, per volt A.C.): 0-2.5, 10, 50, 250, 1000, 5000  
Milliamperes, D.C.: 0-10, 100, 500  
Microamperes, D.C.: 0-100  
Size: 16" x 12 1/2" x 6 1/4"  
Dealer's Net Price, complete with Operator's Manual. . . . . \$128.50



## MODEL 330 Mutual Conductance Tube Tester

The Simpson Model 330 tests tubes in terms of PERCENTAGE of rated DYNAMIC MUTUAL CONDUCTANCE, a direct indication of tube performance with reference to the manufacturer's STANDARD MICROMHO rating. The colored zones on the dial coincide with the percentage scale to indicate good, fair, weak or definitely bad tubes. Tubes are tested at audio frequency (2500 cycles) with voltages applied automatically over the entire operating range, reproducing more completely than ever before the actual conditions, under which a tube normally functions. A compact assembly of ten push button switches and nine rotary switches of six positions each provide infinite combinations for tube circuit selection.

When you have finished a tube test, ONE BUTTON\* returns all switches to the normal position.  
Size: 16" x 12 1/2" x 6 1/4" With Simpson "No Backlash" Roll Chart  
Dealer's Net Price, complete with Operator's Manual. . . . . \$132.50

## MODEL 335 Plate Conductance Tube Tester



Model 335 tests tubes under conditions simulating actual use in a radio set. The dial indicates percentage of rated plate conductance. With a minimum of settings a percentage reading is quickly obtained which, for all practical purposes, is a true percentage of the tube's rated value. Regardless of tube load, filament voltages are maintained practically constant automatically. Each tube element is individually connected to proper potential. Reliable short test is provided. Diodes tested on low voltage. Automatic Reset switch clears way quickly for the next test. (See description above).

All standard tube sockets are available, including 9 pin miniatures, also sub-miniatures as used in hearing-aids, etc. Additional space is provided for new sockets.  
With Simpson "No Backlash" Roll Chart  
Size: 16" x 12 1/2" x 6 1/4"  
Dealer's Net Price, complete with Operator's Manual. . . . . \$98.50

## MODEL 340 Signal Generator



75 Kilocycles to 120 Megacycles — fundamentals to 30 Megacycles.

From its lustrous black anodized panel to the big nine-inch meter dial and knife edge pointer that mean easy readability, the Model 340 is an instrument packed with Simpson "precision-engineered" refinements for greatest utility and long-lasting accuracy. An electron coupled circuit, using three tubes—full wave rectifier, modulator, and oscillator—and standard 30% modulation at 400 cycles, assures extreme stability and output uniformity. Close settings are permitted by a smooth vernier control. RF coils provide ranges of 75-220; 200-600; 550-1700 KC; and 1.5-4.5, 4.2-14; 9-30; 36-120 megacycles. Fundamentals range to 30 MC, and the dial is direct reading to 120 MC.

Shielding in the Model 340 is complete; coils, attenuator, and signal selector being individually shielded. The oscillator and modulator are sealed in a rigidly welded, entirely closed chassis. In addition, the line cord is shielded, thus reducing leakage to a negligible point. Signal output is controlled through an ingenious step attenuator of the ladder type, by means of which the volume level of each step is regulated by a smooth, non-inductive control. A special jack is provided in the Model 340 for desirable high output on the 120 MC band.  
For 105-130 volts, 50-60 cycle  
Size: 16" x 10" x 6"  
Dealer's Net Price, complete with Operator's Manual. . . . . \$69.85

# The Famous Simpson Micro-Testers . . . . . 16 Hand Size Portables

All Simpson "Micro Tester" Portables are hand size (3" x 5 1/2" x 2 1/4"), all ruggedly cased in black molded bakelite (except Model 380

Wavemeter which is shielded in cast aluminum) all have full three-inch scales. Approximate weight 1 1/2 lbs. Shipping weight 2 1/2 lbs.

Model 240 Volt-Ohm-Milliammeter Ranges: A.C. Volts: 0-15, 150, 750, 3000; D.C. Volts: 0-15, 75, 300, 750, 3000; D.C. Milliampers: 0-15, 150, 750; Ohms: 0-3000 (center scale 30), 0-300,000 (center scale 3000); Accuracy: D.C. 3%—A.C. 5% Dealer's Net Price \$21.75	Model 230 Volt-Ohm-Milliammeter Ranges: A.C. Volts: 0-10, 250, 1000; D.C. Volts: 0-10, 50, 250, 1000; D.C. Milliampers: 0-10, 50, 250; Ohms: 0-1000, 0-100,000; Accuracy: D.C. 3%—A.C. 5% Dealer's Net Price \$19.85	Model 370 A.C. Ammeter (With self-contained current transformer . . . for use on 60 cycles.) Ranges: 0-1, 0-2.5, 0-5, 0-10, 0-25 Amperes. Dealer's Net Price \$18.50	Model 371 A.C. Voltmeter Ranges: 0-150, 0-300, 0-600 volts. Dealer's Net Price \$16.75	Model 372 Ohmmeter Ranges: 0-500 ohms (5 ohms center), 0-5000 ohms (50 ohms center), 0-50,000 ohms (500 ohms center), 0-500,000 ohms (5,000 ohms center), 0-5 Meg. (50,000 ohms center), 0-50 Meg. (500,000 ohms center) with leads. Dealer's Net Price \$23.20	Model 373 D.C. Milliammeter Ranges: 0-1, 5, 10, 25, 50, 100, 250, 500, 1000 Milliampers. Dealer's Net Price \$18.25	Model 374 D.C. Microammeter Ranges: 0-50, 100, 250, 500, 1000 Microampers. Dealer's Net Price \$20.90	Model 375 D.C. Ammeter (Self-Contained) Ranges: 0-1, 0-2.5, 0-5, 0-10, 0-25 Amperes Dealer's Net Price \$18.70	Model 376 A.C. Voltmeter (Rectifier Type) Ranges: 0-5, 10, 25, 50, 100, 250, 500, 1000 A.C. Volts. Dealer's Net Price \$18.25	Model 377 D.C. Voltmeter Ranges: 0-1, 2.5, 5, 10, 25, 50, 100, 250, 500, 1000 D.C. Volts. Dealer's Net Price \$18.25	Model 378 A.C. Milliammeter (With self-contained current transformer) Ranges: 0-5, 0-25, 0-100, 0-250, 0-1000 M.A. Dealer's Net Price \$20.50	Model 379 Load Type Dry Battery Tester For all radio, hearing aid A and B batteries. Not just another voltmeter. Actually places battery under proper load during test. Designed with leading battery manufacturers. Dealer's Net Price \$21.50	Model 380 Wavemeter and Modulation Indicator Spots transmitter at any point on band; checks percentage modulation; monitors transmission quality; plots field patterns; 2' antenna; coils for 10, 20, 40, 80 meter bands. Dealer's Net Price \$37.85	Model 390 Volt-Amp-Wattmeter Ranges: (A.C., 60 cycles); Amperes: 0-3, 0-15; Watts 0-300, 0-600, 0-1500, 0-3000. Dealer's Net Price, with Break-In Plug (4-color coded leads) and Operator's Manual. . . . \$39.50	Model 391 A.C.-D.C. Volt-Wattmeter (3000 watts max.) For simultaneous reading of volts and watts. Ranges, A.C. or D.C. Volts: 0-130, 0-260; Watts: 0-1500, 0-3000 Dealer's Net Price \$30.00	Model 392 A.C.-D.C. Volt-Wattmeter (5000 Watts max.) For simultaneous reading of volts and watts. Ranges, A.C. or D.C. Volts: 0-130, 0-260; Watts: 0-1000, 0-5000 Dealer's Net Price \$35.00

ASK YOUR JOBBER, OR SEND FOR COMPLETE, DESCRIPTIVE LITERATURE ON ANY OF THE ABOVE INSTRUMENTS.