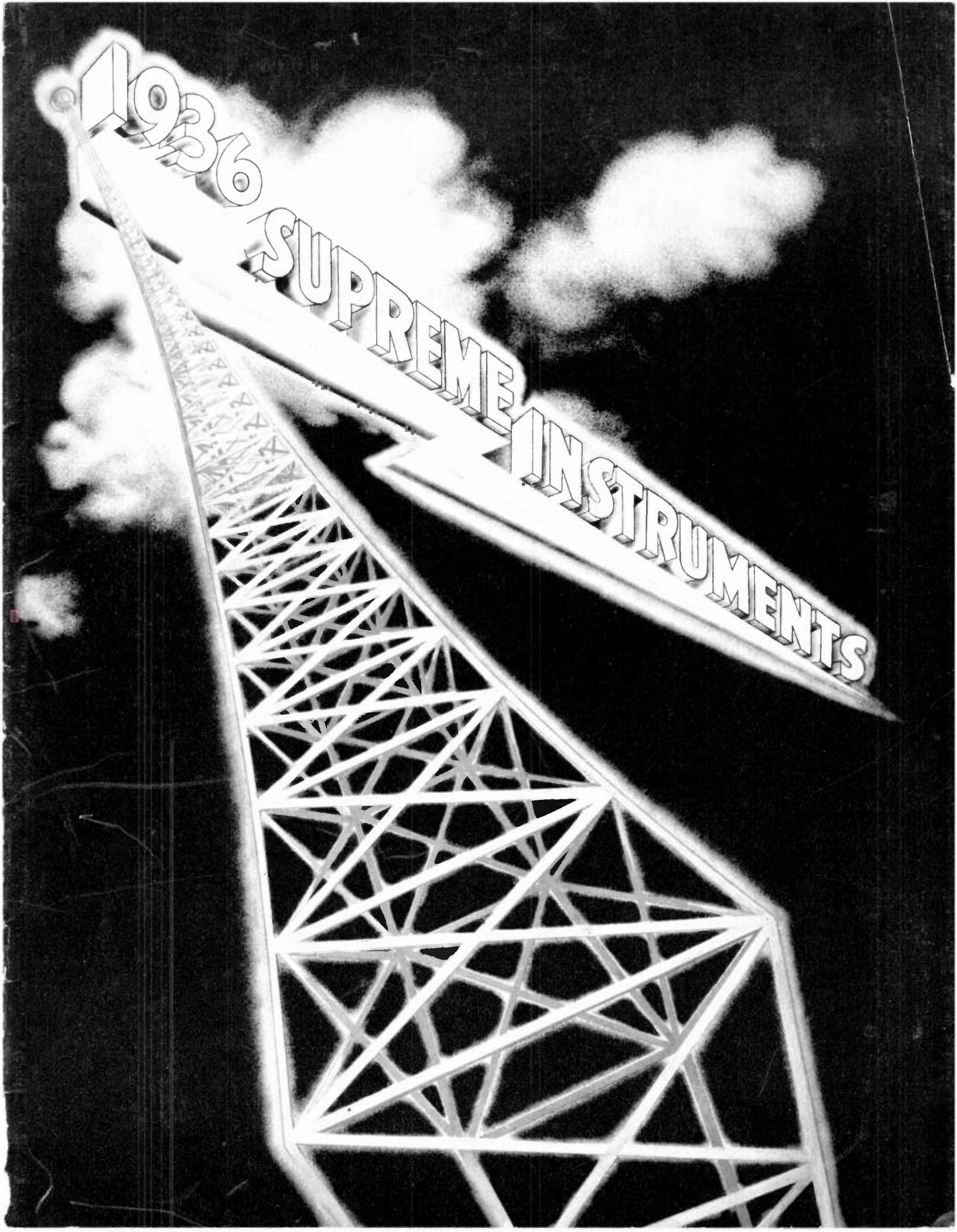

1936
SUPREME INSTRUMENTS

SUPREME 385 AUTOMATIC

The Model "385 Automatic" is designed for the professional radio service engineer who prefers his equipment in one compact unit. It is an outstanding value, with a professional appearance which makes it the pride of any owner. The Model "385 Automatic" embodies unexcelled engineering design and workmanship, and includes all of the features of the Model 89-DeLuxe Tube Tester and the Model 339 DeLuxe Analyzer.

The tube testing circuits of the Model "385 Automatic," as well as those of the Models 89 Counter, 89 DeLuxe and 89 Standard, incorporate a balanced ratio between tube and circuit resistance values. Heretofore, it has been customary to utilize fixed resistance values in tube testing circuits as protective devices, and as a means for limiting the potentials applied to certain types of tubes. Such resistance values, obviously, constitute resistive loads external to tubes under test in the testing circuits. Since the various types of tubes which are encountered in service have different effective internal resistance values, a variable ratio exists between the internal resistance values of tubes and the fixed resistance values of the testing circuits. Also, as a tube depreciates, the internal resistance of the tube increases, so that the ratio of the internal resistance of a tube to the fixed external resistance of the testing circuit changes as the tube depreciates.

The relationship described above may be better understood by assuming a typical case in which the effective internal resistance of a normal tube may be 1000 ohms and which is subjected to test in an old-style tester which utilizes a fixed 500-ohm limiting resistor in the testing circuits external to the tube; obviously the ratio between the two values is 1000:500 or 2:1. When the tube depreciates to such an extent that it is just half as good as normal, its internal resistance will be 2000 ohms; the ratio between the internal and external resistance values will then be 2000:500 or 4:1. The total resistance of the circuit, including that of the normal tube, was originally 1500 ohms; after the tube resistance is doubled by depreciation, the total resistance of the circuit, including that of the depreciated tube, is 2500 ohms. It is observed that, while the tube resistance has doubled, the total circuit resistance has not doubled, so that the meter current will not be reduced in half; therefore, the meter reading will be deceptive, because it will indicate the tube as being better than it really is. If the same circuit with a fixed 500-ohm resistance value be used for testing a tube which has a normal internal resistance value of 100 ohms, the meter indication of a depreciated tube will be even more deceptive. Normally, the total of the two resistance values will be 600 ohms, but if the internal resistance value of the tube be doubled by depreciation to a value of 200 ohms, the total circuit resistance will then be 700 ohms, or an increase of only 100 ohms in 600 ohms. This would result in a reduction of only about 17% in the meter current, although the internal tube resistance has doubled.

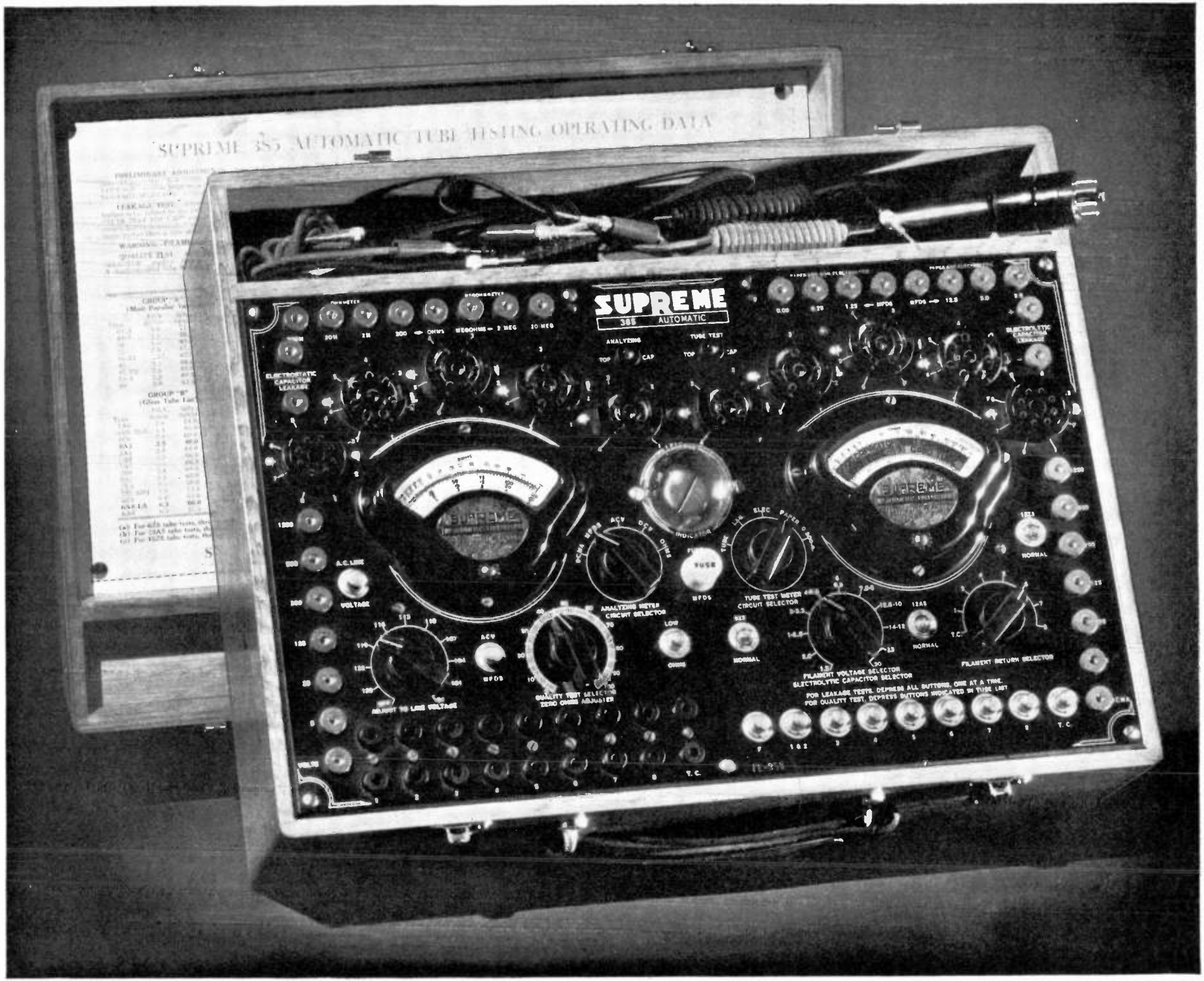
The conditions just described may be referred to as the "swamping effect" of load resistance values. It is obvious that, for the maximum of accuracy, the external load resistance should be considerably less than the effective internal tube resistance value of any tube, and that the ratio between internal tube resistance values and external circuit resistance values should be constant for all types of tubes. This desirable feature has been accomplished in Supreme tube testing circuits by utilizing a high-resistance meter which requires, for a normal tube load deflection, an applied potential which is 10% of the total potential value of the tube testing circuit, regardless of the setting of the "quality test selector." Since the meter potential is always 10% of the total circuit potential the meter resistance is always 10% of the total circuit resistance, regardless of the direct current load which may be carried by a tube under test. With this arrangement of balanced ratio between internal tube and external circuit resistance values, the meter reading drops in proportion to tube depreciation, so that "bad" tubes which test "good" on the usual tube tester types are correctly indicated as being "bad" on the new Supreme tube testers. It is obvious, therefore, that Supreme tube testers should enable more replacement tube sales than older types of tube testers.

Both of the Supreme 5-inch meters have ohmmeter ranges, the extremely low range from zero to 200 ohms being accommodated by the meter which is used for tube testing and for electrolytic capacitor leakage tests. The A.C. potential-measuring functions of the Model "385 Automatic" and of the Models 339 DeLuxe and 339 Standard, being isolated from the D.C. measuring functions, are ideally suited for output measurements across the plate circuits of power tubes where both A.C. and D.C. potentials exist when signals are passing through the radio. The low ranges can also be used for output measurements directly across the voice coil terminals.

The Model "385 Automatic" has a professional appearance in keeping with the quality of its design and skilled workmanship. The verichromed bakelite panel is mounted in a beautifully-finished hardwood carrying case, with a large compartment for accessories and small tools, and a removable cover in which is mounted a large and easily-readable "Tube List" card with simplified instruction data. The "385 Automatic" measures only 6½"x13-5/16"x 17¾" and weighs only 22 pounds. When packed in a 10"x17"x22" air-cushioned carton, the shipping weight is 28 pounds. For 98/125-volt, 60-cycle power supply unless otherwise ordered at slight additional cost.

DEALER'S NET CASH WHOLESALE PRICE $77.95

Telegraphic Code Word
SUCOM


SUPREME 385 AUTOMATIC TUBE TESTING OPERATING DATA
SUPREME
385 AUTOMATIC
ANALYZING
TUBE TEST
ELECTROSTATIC CAPACITOR LEAKAGE
ELECTROLYTIC CAPACITOR LEAKAGE
A.C. LINE VOLTAGE
ADJUST TO LINE VOLTAGE
ANALYZING METER CIRCUIT SELECTOR
QUALITY TEST SELECTOR ZERO OHMS ADJUSTER
FUSE
TUBE TEST METER CIRCUIT SELECTOR
FILAMENT VOLTAGE SELECTOR ELECTROLYTIC CAPACITOR SELECTOR
FILAMENT RETURN SELECTOR
FOR LEAKAGE TESTS, DEPRESS ALL BUTTONS, ONE AT A TIME.
FOR QUALITY TEST, DEPRESS BUTTONS INDICATED IN TUBE LIST

SUPREME 339 DE LUXE ANALYZER

This DeLuxe Analyzer is designed for the professional radio serviceman who prefers his equipment in separate units instead of a combination unit like the Model "385 Automatic," and who wants more test functions and more meter ranges than those included in the lower priced Model 339 Standard Analyzer. It is an ideal complement to the Model 89 Standard Tube Tester, none of the functions of which are duplicated in this tester, or it may be used with the Model 89 DeLuxe Tube Tester if the DeLuxe features of the latter tester are desired.

The new Supreme 5-inch fan-shaped meter with large and easily readable scales which are 26% longer than the usual meter scales, provides five resistance-measuring ranges, six D.C. milliampere ranges, six D.C. volt ranges, six A.C. volt ranges, six output ranges, and six capacity-measuring ranges. While it is generally understood that a meter with several ranges enables closer readings than is enabled by a single meter with one high range, there is another reason for the use of multiple ranges; namely, the fact that meter accuracy tolerances are based on full scale values. This meter has an accuracy tolerance of 2% of full-scale values, and since the uniformly-divided scale has 50 divisions, the accuracy tolerance is one division which, in the case of the potential-measuring ranges, represents 2.5 volts on the 125-volt range, or 5.0 volts on the 250-volt range. It is obvious, therefore, that a 110-volt potential should be measured on the 125-volt range instead of being measured on the 250-volt range, because a possible error of 2.5 volts is a smaller percentage of 110 volts than would be a possible error of 5 volts in 110 volts. It may, then, be generally stated that an electrical value should be measured on the lowest range of the meter which will accommodate the electrical value, and that more accurate measurements are enabled by a meter which has the larger number of ranges overlapping each other. While the meter accuracy tolerance is 2%, as stated above, some allowance must be made in the over-all accuracy tolerances of the tester to allow for the accuracy tolerances of the resistors and of the rectifier. Stabilized ceramic resistors are used as multipliers, thereby assuring long life and minimizing the possibilities of damages incidental to inadvertent overloads.

A single 50-division scale of the meter provides ranges of 0/5/25/125/250/500/1250 volts (A.C., or D.C. at 1000 ohms per volt), and D.C. milliamperes, and microfarads when divided by 100, so that the adjacent scales overlap each other from 20% to 50%, depending upon what two adjacent ranges are compared. It is observed that the full-scale values of the 50-division scale are multiples of 5, so that the divisions are more easily interpreted than would be the case if the various range values were multiples of more than one basic value. With five "OHMS" ranges on another single scale, all measurements are interpreted on only two scales, so that large figures are enabled for easy readability. The lowest division on the single "OHMS" scale represents 1 ohm, and the center division represents 35 ohms. This scale is used (1) for resistance measurements within ranges of 0 to 2,000, 0 to 20,000 and 0 to 200,000 ohms, powered with a self-contained 4.5-volt battery, and (2) for resistance measurements within ranges of 0 to 2 and 0 to 20 megohms, powered with a self-contained "power pack" for converting ordinary A.C. power supply potentials into the necessary D.C. potentials.

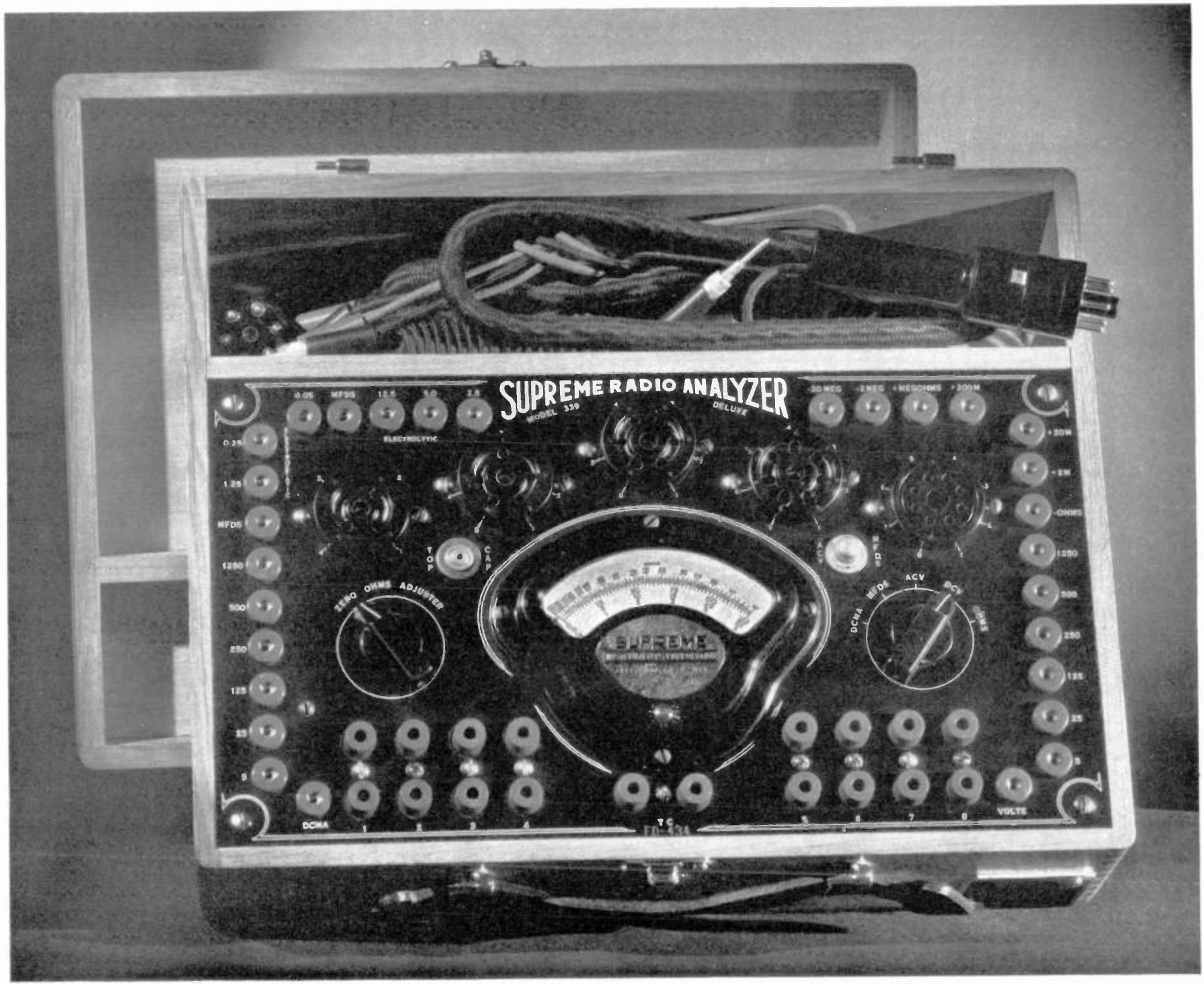
Because the internal resistance of instrument rectifiers increases with decreasing loads, it is usually necessary to utilize an off-set scale for A.C. potential and capacity measurements. By means of a unique circuit design in this tester, all A.C. potential and capacity measurements are interpreted on the same uniformly-divided scale as that which is used for D.C. potential and current measurements. This enables fewer scales and less confusion in reading the scales. The instrument rectifier used in this tester is protected against damages incidental to instantaneous electrical surges from transformers, capacitors, chokes, etc., by means of a normally-closed push button switch included in the design so that such surges will be shunted around the input terminals of the instrument rectifier before the user of the tester has time to open the switch by depressing the switch button. This assures positive protection to the instrument rectifier. Fuses cannot be safely used for rectifier protection, because rectifiers can be damaged before fuses attain their "fusing" temperatures.

The exclusive Supreme free-reference point system of analysis is utilized in the tester, thereby assuring the maximum of flexibility in its various service applications. Any circuit may be used as a reference circuit for any desired potential measurement; in other words, potentials may be measured from any one circuit to all other circuits, or between any two circuits, and current measurements can be effected in all circuits. The flexibility of the Supreme Free Reference System of analysis is evidenced by its adaptability to the new metal and metal-glass tubes in which different pins may represent filament or heater terminals in different metal tube types. Comparative tube tests can be made with this tester from the sockets of operative radios by the well-known "grid-shift" method utilizing the self-contained 4.5-volt battery, and microphones, headsets, etc., may be connected into any circuit for special tests. The minimum of obsolescence probabilities are assured by the Supreme Free Reference Point System of Analysis.

The meter and all controls are mounted on a richly-finished bakelite panel which is mounted in a beautifully-finished hardwood carrying case with a detachable slip-hinged cover. This tester measures 4⅞"x10½"x13⅛" and weighs only 12 pounds, and, when packed in a 9"x 15"x17" air-cushioned carton, the shipping weight is 16 pounds. For 110/120-volt, 60-cycle power supply unless otherwise ordered at slight additional cost.

DEALER'S NET CASH WHOLESALE PRICE $39.95

Telegraphic Code Word
SUDAN


SUPREME RADIO ANALYZER
MODEL 330
DELUXE
ELECTROLYTIC
TOP
CAP
ZERO OHMS ADJUSTER
SUPREME
ACV
DCV
DCMA
VOLTS
TC

SUPREME 339 STANDARD ANALYZER

The Model 339 Standard Analyzer is intended for the radioman who does not care for the additional functions and meter ranges of the Model 339-DeLuxe Analyzer, but who wants Supreme-by-Comparison quality and workmanship in a lower-priced analyzer. The new model 339-S Analyzer may be used either for the preliminary radio testing procedure in a customer's home for estimating purposes, or for the "trouble-shooting" practices in the professional radio service engineer's laboratory to (1) find the trouble by selective and elementary tests, (2) check the replacement parts used in the course of the repairs, and (3) check the overall performance of the radio after the repairs are completed and before returning the repaired radio to the customer.

This tester utilizes the new Supreme Model 310 5-inch fan-shaped meter, with a low-range A.C. volts scale, an evenly-divided scale for D.C. milliamperes, high-range A.C. volts and for D.C. volts and an "OHMS" scale for resistance measurements. The large figures on the long scales enable easy readability under all usual lighting conditions. This new Supreme meter is the first meter to be designed especially for use in radio testing equipment. This meter requires only 1 milliampere of current for full-scale deflection, so that it has a sensitivity of 1000 ohms per volt for all D.C. potential measurements. The accuracy tolerance of Supreme meters is 2% of full-scale values, and observational errors are reduced to a minimum by the use of a combination "spade" and "knife-edge" type pointer for maximum accuracy and ruggedness. For all current, potential and resistance measurements, the meter is "built up" to a resistance value of 300 ohms by means of an adjustment resistor connected in series with the meter. The actual armature resistance of the meter is about 115 ohms, which is more than the usual resistance value of a 1-milliampere meter; this high resistance value is used so as to enable more turns of wire on the armature to provide a greater movement torque, thereby greatly minimizing the possibility of a "sticky" movement after the meter is subjected to strenuous service.

A rotary switch is used to select the meter functions and ranges. Two current-measuring ranges of zero to 5 and zero to 125 milliamperes (D.C.) are provided for plate current and other current measurements. The low range will accommodate the loads of most general purpose and detector tubes, while the loads of power amplifiers and of rectifiers can be accommodated on the high range. The four D.C. potential-measuring ranges of 0 to 5, 0 to 125, 0 to 500 and 0 to 1250 volts enable a complete coverage of all of the plate, grid, cathode, pentode and other D.C. potential values which are encountered in radio receivers. A.C. filament or heater, rectifier plate, A.C. power output, and all other A.C. potential values or radio receivers are accommodated by four A.C. potential-measuring ranges of 0 to 5, 0 to 125, 0 to 500 and 0 to 1250 volts. For output measurements across the plate circuits of power tubes where both A.C. and D.C. potentials exist when signals are passing through the radio, the A.C. signal potentials are isolated from the D.C. measuring functions by means of an output capacitor. The low A.C. potential-measuring ranges can also be used for such measurements directly across the voice coil terminals. A self-contained 4.5-volt flashlight battery is used for two resistance-measuring ranges of zero to 2000 and zero to 200,000 ohms, both ranges being interpreted on a single "OHMS" scale, the lowest division of which represents 1 ohm, and the center division of which represents 35 ohms.

The two resistance-measuring ranges are usually adequate for all practical servicing requirements. The 4.5-volt flashlight battery should not require replacement more often than once per year, and the standard replacement cells are obtainable at most drug stores and from all electrical jobbers.

The exclusive Supreme free-reference point system of analysis is utilized in the tester for the accommodation of all of the test requirements of the new metal and metal-glass tubes which utilize octal or 8-pin bases, as well as all other types of tubes and circuits. The universal acceptance of Supreme's exclusive free-reference point system of analysis is evidenced by the many attempts to incorporate a similar system in other testers, as this system is, unquestionably, unexcelled for flexibility in its various service applications. Any circuit may be used as a reference circuit for any desired potential measurement; in other words, potentials may be measured from one circuit to all other circuits, or between any two circuits, and current measurements can be effected in all circuits. The use of the Supreme free-reference system of analysis reduces the obsolescence probabilities of this tester to a minimum. The analyzing circuits are selected in the Model 339-S by means of specially-designed twin jacks and the regular test leads required in every radio service operation, instead of being accomplished by a number of complicated rotary switches which are always possible sources of service trouble, and which are more confusing than the simple and straightforward procedure enabled by the use of the regular test leads to which resort must be made in the final analysis of any service problem, regardless of the preliminary method suggested by any particular tester design.

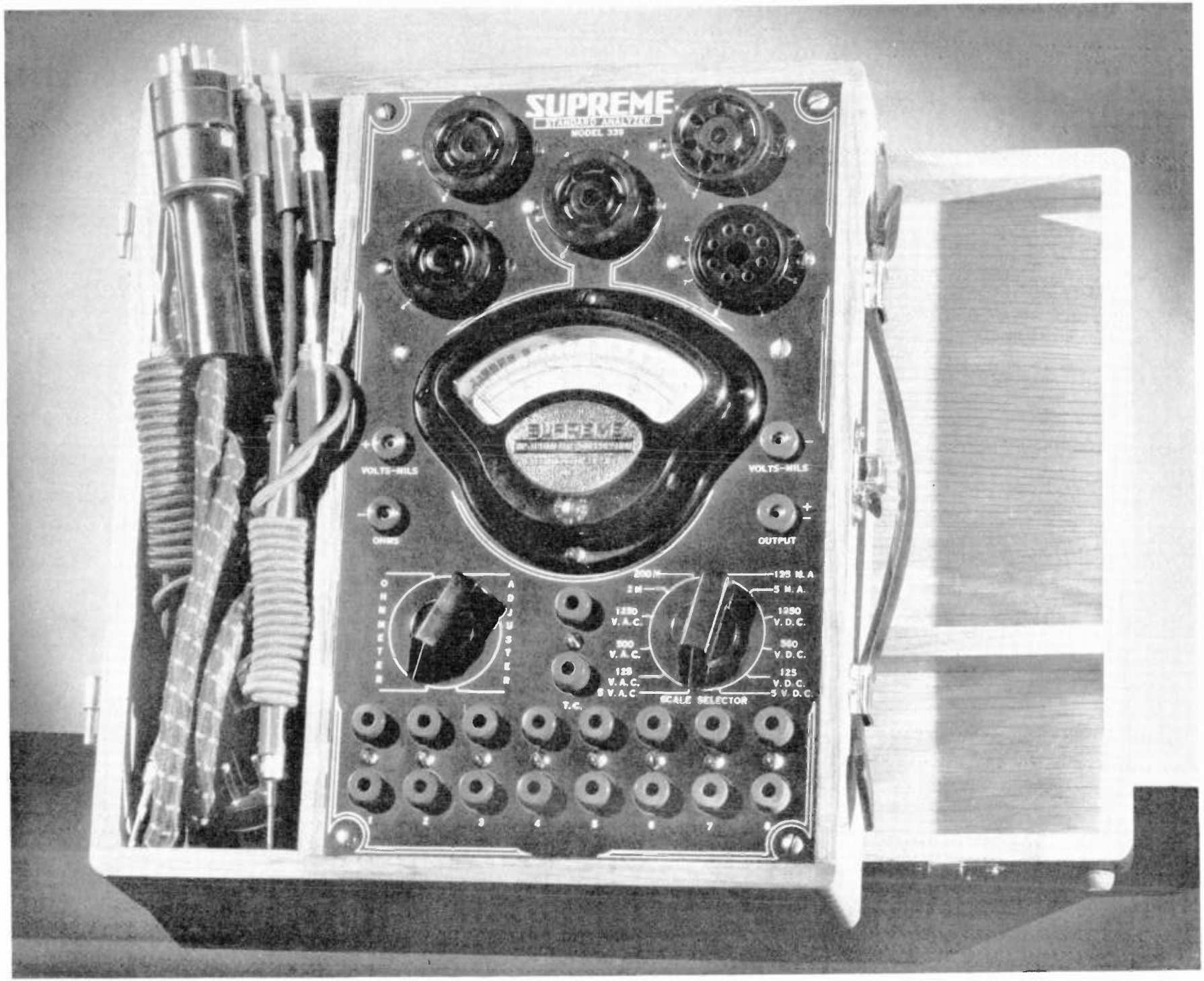
Like all of Supreme's 1936 testers, the pin numbers of all types of tubes, regardless of the number of pins on the base of any tube, are lettered on the panel around the sockets, with corresponding numbers lettered on the panel adjacent to the free-reference twin jacks, thereby greatly simplifying the various service applications of the analyzer. All functions and ranges of the meter are connected through the switch to only four insulated pin jack terminals.

All lettering and markings are verichromed on a richly-finished bakelite panel which is mounted in a beautifully-finished hardwood carrying case with a detachable cover. This is a tester which the user can proudly display anywhere.

The Model 339 Standard Analyzer measures 4½"x 10"x11⅛" and weighs only 8 pounds. When packed in a 9"x13"x14" air-cushioned carton, the shipping weight is 11 pounds. For operation with any power supply potential or frequency rating.

DEALER'S NET CASH WHOLESALE PRICE $29.95

Telegraphic Code Word
SUSAN


SUPREME
STANDARD ANALYZER
MODEL 339
SUPREME
VOLTS-MILS
VOLTS-MILS
OHMS
OUTPUT
OHMMETER ADJUSTER
T.C.
200 M
2 M
1250 V.A.C.
500 V.A.C.
125 V.A.C.
5 V.A.C.
125 M.A
5 M.A.
1250 V.D.C.
500 V.D.C.
125 V.D.C.
5 V.D.C.
SCALE SELECTOR
1
2
3
4
5
6
7
8

SUPREME 391 P. A. ANALYZER

The Model 391 Power Amplifier Analyzer includes all of the essential facilities for the usual radio servicing requirements, plus facilities for servicing power amplifiers, theatre equipment, and Public Address systems which are being used more and more in auditoriums, stadiums, schools, restaurants, dance pavilions, and in political campaigns. Because the owners of public address sound systems are catering to a critical public, they realize the vital importance of keeping their audio installations in perfect operating condition. The small neighborhood "talkie" operator, for example, knows how quickly a break-down of his sound equipment will close his doors. The professional radio service engineer who is equipped to service such installations is the logical man to be called upon to keep the installations at their peak performances, and he will be well rewarded for his services. The Model 391 P.A. Analyzer is the only commercial tester designed specifically for both public address and ordinary radio service requirements.

The new Supreme 5-inch meter, with a full scale sensitivity of 200 microamperes is used in this tester to provide (1) six D.C. potential measuring ranges and (2) six A.C. potential-measuring ranges of 0 to 5, 0 to 25, 0 to 125, 0 to 250, 0 to 500 and 0 to 1250 volts, (3) ten current-measuring ranges of 0 to 250 microamperes, 0 to 1.25, 0 to 5, 0 to 25, 0 to 125, 0 to 250 and 0 to 500 milliamperes (D.C.) and 0 to 1.25, 0 to 5.0 and 0 to 12.5 amperes (D.C.), (4) ten electrostatic and electrolytic capacity-measuring ranges of 0 to 0.00125, 0 to 0.005, 0 to 0.0125, 0 to 0.05, 0 to 0.125, 0 to 0.5, 0 to 1.25, 0 to 5.0, 0 to 12.5 and 0 to 50.0 mfds., on a single evenly-divided scale, (5) six resistance-measuring ranges of 0 to 500, 0 to 5000, 0 to 50,000, ohms and 0 to 0.5, 0 to 5.0 and 0 to 50.0 megohms, on a single "OHMS" scale, and (6) two power level indicating ranges of minus 10 to plus 20 and plus 5 to plus 35 decibels on two "DECIBELS" scales. It is obvious, therefore, that a single meter is used for six purposes to provide a total of 40 measuring ranges.

The measurement of A.C. potential and capacitive values on the same scale as that used for D.C. potential and current measurements is enabled by the use of the system of phasing compensation which is also used in the Models 339-D and 385, and which is an exclusive Supreme development. By means of phasing compensation, the effects of the non-linear characteristics of the instrument rectifier are reduced to such an extent that the measurements for which the rectifier is required can be interpreted on a linear or evenly-divided scale. The phasing compensation in the Models 339-D, 385 and 391 is accomplished by the use of a series capacitor in the low A.C. potential-measuring range to minimize the effect of resistance variations in the rectifier upon the total impedance of the measuring circuit, and the use of parallel capacitors, associated with each multiplier resistor of each high potential-measuring range, to compensate the difference between R.M.S. and "average" values of full-wave rectified current. The popular and universal acceptance of this method is evidenced by efforts which are being made to imitate or copy the method in similar testers.

Telegraphic Code Word
SUPAN

The rectifier is also used to convert the ordinary A.C. power supply potentials of house lighting circuits into the necessary D.C. values for the resistance measuring ranges, leaving the self-contained battery for exclusive use in testing tubes by the "grid shift" method from the sockets of operative radios and power amplifier circuits.

Facilities are provided in the Model 391 for direct measurement of the power level in decibels in a 500 ohm line up to plus 35 DB with respect to the accepted zero level of 6 milliwatts. Zero level of 6 milliwatts in a 500 ohm line is the accepted reference level. A chart showing actual line DB's in terms of meter DB's for various common line impedances, accompanies each Model 391 Tester. A decibel is a unit measurement of sound. Photo-electric cells may be checked with the Model 391 by inserting the microammeter directly in one side of the cell circuit; the current flowing can be ascertained both with the cell dark and with full illumination. A good cell shows a considerable difference between the two readings, the exact amount depending upon the type and make of cell. Battery-charging and Tungar Bulb Rectifiers can be tested by inserting the D.C. ammeter in the top clip lead of such rectifier bulb.

The Supreme Free Reference Point System of Analysis is incorporated in the Model 391, and arrangements are provided for checking sets embodying the new 8-prong metal tubes, with switches for properly connecting in the filaments, which are not always in the same place on tubes of different numbers of pins.

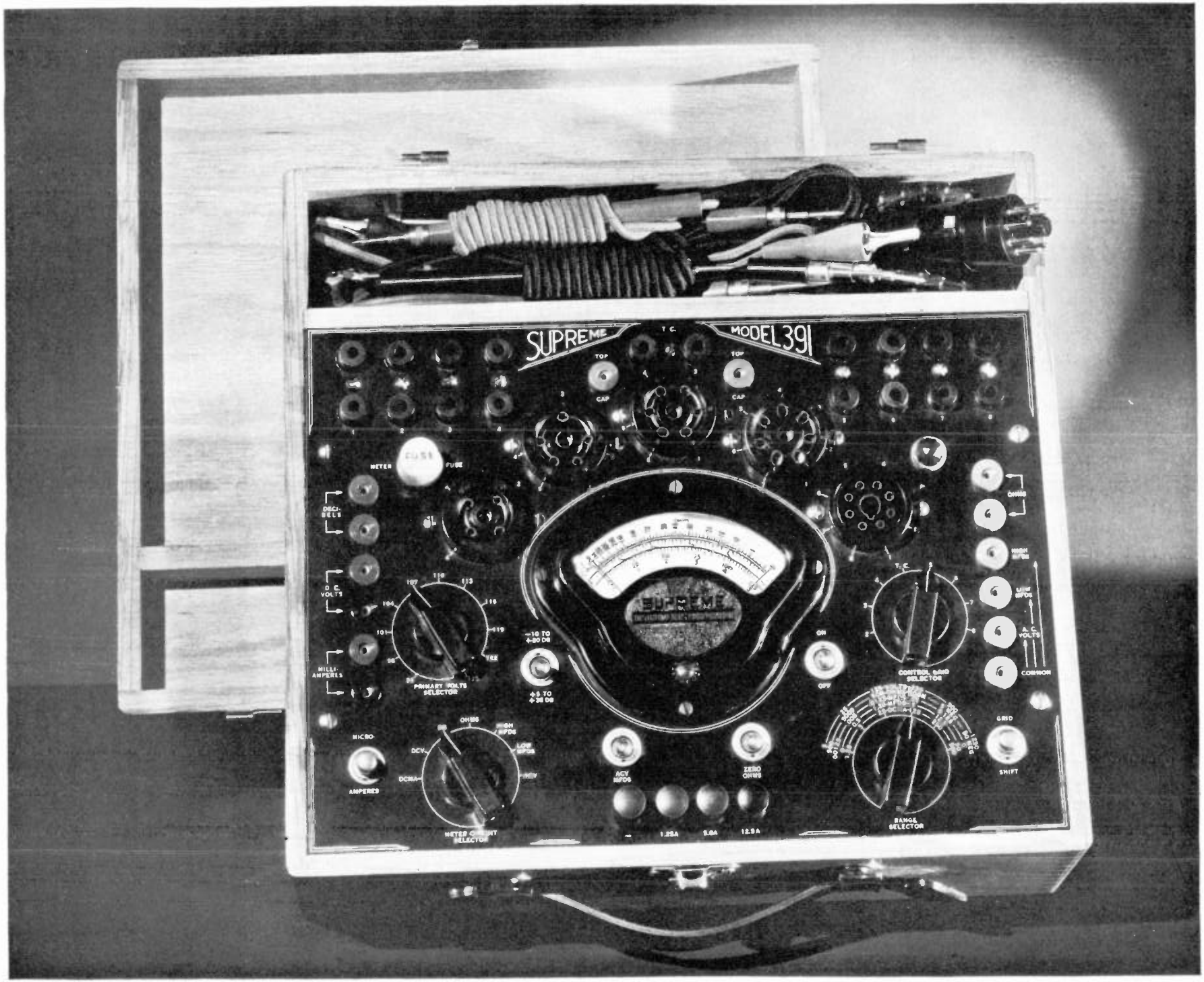
The meter is properly protected by a high speed fuse, replaceable from the top of the panel; and the rectifier is protected against surges by a normally-closed switch which shunts the surges around the rectifier before the operator opens the shunt circuit by depressing the switch button.

The Model 391 P. A. Analyzer is a complete sound equipment tester which will reveal everything which should be known about any part of a talkie system. Periodical usage of this new tester will eliminate breakdowns, enable the correction of noisy systems and provide the means for obtaining that clear crispness of speech, and smoothness and naturalness of tone so much desired.

The 391 has been especially designed for use in the theatre. It is simple in its operation, yet completely and easily makes all tests and checks necessary for 100% excellent sound equipment operation. The projectionist who is familiar with the technique of his installations can operate it himself and keep his own equipment in shape.

All controls are identified by verichromed characters on a bakelite panel which is mounted in a polished hardwood carrying case with a slip-hinged cover. The necessary accessories are included in a compartment back of the panel. Small tools can be carried in the compartment. The tester measures 5½"x11¼"x12⅜" and weighs only 14 pounds. When packed in a 9"x15"x16" air-cushioned carton, the shipping weight is 18 pounds.

DEALER'S NET CASH WHOLESALE PRICE $69.95


SUPREME
MODEL 391
T.C.
TOP
CAP
METER
FUSE
DECI-BELS
D.C. VOLTS
MILLI-AMPERES
MICRO-AMPERES
PRIMARY VOLTS SELECTOR
-10 TO +20 DB
+5 TO +36 DB
ON
OFF
CONTROL GRID SELECTOR
OHMS
HIGH MFDS
LOW MFDS
A.C. VOLTS
COMMON
GRID
SHIFT
DCV.
DCMA.
ACV MFDS
ZERO OHMS
1.25A
5.0A
12.5A
RANGE SELECTOR
METER CURRENT SELECTOR

SUPREME 89 DE LUXE TUBE TESTER

The portable Model 89-DeLuxe Tube Tester is designed for the progressive radio service engineer who wants the DeLuxe features of D.C. voltmeter ranges, ohmmeter ranges, and capacitor leakage-indicating ranges in addition to the tube testing functions of the Model 89 Standard Tube Tester. While his analyzer is being used on other service work, this Model 89-DeLuxe Tester can be used on service calls for tube tests and for the other preliminary tests which are usually necessary for estimating purposes in customers' homes. This tester includes all of the tube testing features of the Models 89-C, 89-S and 385.

The new Supreme 5-inch fan-shaped meter, with scales 26% longer than the usual meter scales, is used in this tester. The longer scales enable larger figures which are more easily readable in poor light. The Supreme meter has a rugged pointer with a knife edge which enables accurate readings. The meter has a tube testing scale which is divided into "BAD," "?" and "GOOD" sectors. Four D.C. potential-measuring ranges of 0 to 5, 0 to 125, 0 to 500, and 0 to 1250 volts, at 1000 ohms per volt, enable a complete coverage of all the D.C. potential values which are encountered in radio receivers, and a single "OHMS" scale is used for resistance measurements within ranges of 0 to 2,000, 0 to 20,000 and 0 to 200,000 ohms. These ranges are generally considered as being adequate for all practical service requirements, and are powered with a self-contained 4.5-volt flashlight battery which should last indefinitely, because the intermittent load imposed upon the battery is extremely low. The lowest division of the "OHMS" scale represents 1 ohm, and the center division represents 35 ohms, so that the ohmmeter is ideally suited for continuity tests, and for measurements of low resistance values. In addition to the resistance-measuring ranges which are powered with the self-contained 4.5-volt battery, 2 ranges of 0 to 2 megohms and 0 to 20 megohms are powered with a self-contained miniature "power pack" for measurements of extremely high resistance values. The miniature "power pack" which converts the ordinary A.C. power supply potential into the required D.C. output potentials, is also used for an electrolytic capacitor leakage test on an English-reading meter scale which is divided into "GOOD CAPACITOR" and "BAD CAPACITOR" sectors. Supreme is the first and only manufacturer of English-reading electrolytic capacitor leakage testers. Any ordinary electrolytic capacitor of a rated capacitive value up to 12.5-mfds. may be subjected to the test when the meter instantly indicates whether the capacitor is "GOOD" or "BAD" in its leakage characteristics. The measuring circuit is protected against short-circuited capacitors. The full-sized neon lamp which is used in this tester for detecting leakages between tube elements is also used for indicating leakages in electrostatic (paper) capacitors; the lamp is in series with the D.C. potential supply of the self-contained power pack. This arrangement is the best known practical method for indicating leakages in electrostatic (paper) capacitors.

Every insulation material has a certain degree of conductivity; in other words, there is no perfect insulator, and what we generally consider as being an insulator is, in reality, a material of relatively high resistance or low conductivity. It is generally agreed that leakages above 100,000 ohms are permissible for tubes which are in service and that a tube tester should not, therefore, indicate the presence of leakages above values of about two megohms. The sensitivity of the neon lamp as used for detecting tube leakages in Supreme tube testers is limited, by means of a shunt resistor, so as to conform to the recommendations of tube manufacturing engineers. The tests for leakages and "shorts" are made while the tubes are heated, without shifting tubes from one socket to another for such tests. The neon lamp can be used for detecting open-circuited elements of any radio receiving tube, in exactly the same manner as that which is followed in the testing departments of leading radio tube manufacturers.

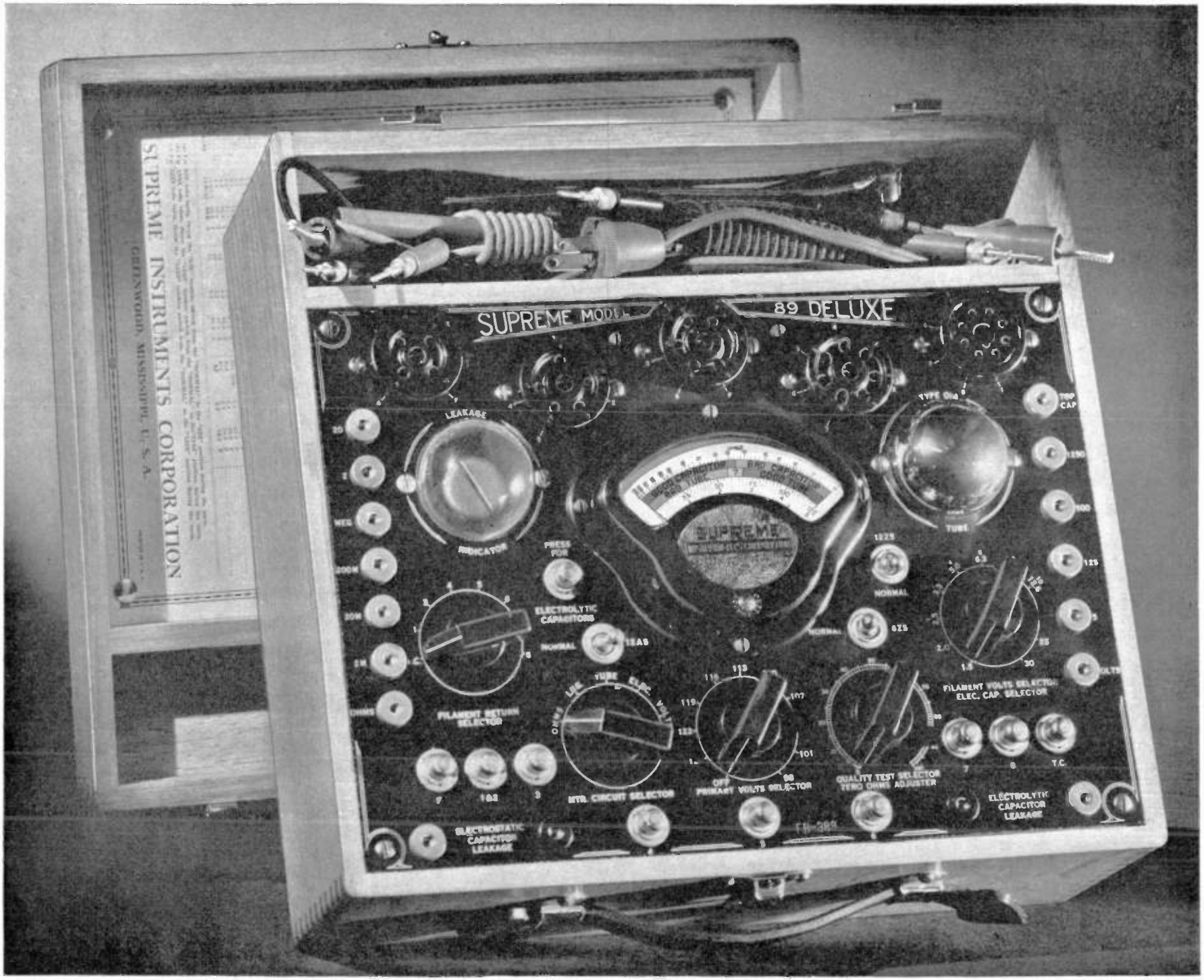
The Model 89-D, like all other Supreme tube testers, is designed for all of the test requirements of the new metal and metal-glass tubes which utilize octal or 8-pin bases. The elements of multiple-element tubes can be tested separately, and both plates of full-wave detectors and rectifiers can be compared. All tubes are tested at approximate rated loads. A tube cannot be placed in the wrong socket, the tester cannot be harmed by short-circuited tubes or by overloads incidental to incorrect operation. All types of radio receiving tubes which are in general use or for which radios are now being manufactured are accommodated by this tester without the use of adapters. While test limits will be supplied by the factory on new tubes, this tester is so designed that the user may establish test limits for any future tube by following the instructions supplied with each tester for establishing such limits. This feature is valuable when new tubes are encountered before the user of the tester receives factory data on the new tubes. The unusual flexibility of this tester assures the minimum of obsolescence probabilities.

All commercial receiving types of tubes which are in general use are listed, with an outline of the simple testing procedure, on a "Tube List" card which is mounted in the cover of the beautiful, natural-finished, hardwood carrying case. The cover is slip-hinged so that it may be easily detached whenever it is desired to do so. A richly finished and verichromed bakelite panel adds to the beautiful appearance of this tester which inspires confidence on the part of the radio service engineer's customers who will appreciate the good judgment he exercises in his choice of Supreme testers.

The tester is 5½"x11¼"x12⅜" and weighs only 13 pounds. When packed in a 9"x15"x16" air-cushioned carton the shipping weight is 17 pounds. For 98/125-volt, 60-cycle power supply unless otherwise ordered at slight additional cost.

DEALER'S NET CASH WHOLESALE PRICE $45.95

Telegraphic Code Word
SUDET


SUPREME INSTRUMENTS CORPORATION
GREENWOOD, MISSISSIPPI, U.S.A.
SUPREME MODEL 89 DELUXE
LEAKAGE
INDICATOR
PRESS FOR
ELECTROLYTIC CAPACITORS
NORMAL
FILAMENT RETURN SELECTOR
INTR. CIRCUIT SELECTOR
OFF
PRIMARY VOLTS SELECTOR
QUALITY TEST SELECTOR
ZERO OHMS ADJUSTER
FILAMENT VOLTS SELECTOR
ELEC. CAP. SELECTOR
ELECTROLYTIC CAPACITOR LEAKAGE
ELECTROSTATIC CAPACITOR LEAKAGE
TYPE 0-16
TUBE
TOP CAP
T.C.

SUPREME 89 STANDARD TUBE TESTER

For the radio service engineer, or for the dealer who wants one tube tester for both counter sales and for service calls, but who does not care for the additional multi-purpose features of the Model 89 DeLuxe Tube Tester, this Model 89 Standard Tube Tester fills a long-felt need. The tube testing functions are identical with those of the Models 89-C, 89-D and 385. This tester is an ideal companion to the Model 339 DeLuxe Analyzer for anyone who prefers his equipment in smaller units in which none of the functions of one tester are duplicated in another tester.

After a radio tube is placed in use, its service life will be limited by one of two factors: namely (1) loss of emission or (2) inter-element leakages. The "quality" test of Supreme testers is designed to indicate the extent of the loss of emission of any tube, and the "leakage" test is intended to reveal the presence of any objectionable inter-element leakages.

The new Supreme 5-inch fan-shaped meter, with an English-reading scale which is 26% longer than the usual meter scales, is used in this tester. The scale is divided into "BAD," "?" and "GOOD" sectors for the "quality" test of all tubes. Variations in power supply potentials are adjusted to a half scale meter reading in this tester, as in the Models 89-C, 89-D and 385. A large full-sized neon lamp is used for indicating the presence of leakages between the various elements of radio tubes, rather than the miniature lower-priced neon lamp which is used in other types of tube testers. The sensitivity of the neon lamp is limited by means of a shunt resistor so that it will not indicate leakages beyond permissible values. In order to get a true indication of any detrimental leakages which may exist between the elements of a radio tube, it is necessary to exclude from the indications any rectification currents which may exist between the elements. The isolation of such uni-directional currents in leakage tests was first applied in Supreme testers, and is covered by one of Supreme's patents.

Supreme tube testers enable separate tests of the diode elements of multiple-element tubes, both plates of fullwave detectors and rectifiers. All tubes are tested at approximate rated loads, and Supreme tube testers are designed for all of the test requirements of the new metal and metal-glass tubes which utilize octal or 8-pin bases.

The filament or heater circuits terminate at what were known as the pins numbered 2 and 7 of the metal tubes which were included in the preliminary announcements of metal tubes. Subsequently, the metal tube type 5Z4 was announced with a filament circuit terminated by pins numbered 2 and 8, and a later type 6P7 octal tube was announced with a heater circuit terminated by pins numbered 2 and 3, so that a socket in which the filament or heater potentials are applied to the contacts numbered 2 and 7, only, cannot be used for testing the later types in which the filament is terminated by pins numbered 2 and 3 or 2 and 8. This design problem was aggravated by the fact that it became apparent that other pins than those numbered 3, 7 and 8 might be used as one of the filament or heater terminals in other metal tubes yet to be announced.

If three 8-hole sockets were used, it would be possible for the user to insert an 8-pin tube in the wrong socket, and the tester would be partially obsolete in the event a metal tube were announced in which neither pin numbered 3, 7 or 8 were used as one of the filament or heater pins. It was, therefore, deemed advisable to effect an arrangement in Supreme tube tester designs whereby the filament or heater current, which may be considered as entering the number 2 pin of the octal tubes, could return through the "top cap" terminal or through any one of the numbered pins of such tubes, and this arrangement has been accomplished with a "filament return selector" switch designed specifically for the new Supreme testers. Therefore, it is impossible to place any tube in the wrong socket, the same socket is used for both "quality" and "leakage" tests while the tube is heated. No adapters are required for any tube, and only one 8-hole socket is required for all present types of octal tubes, and for all future octal tube types in which the filament currents may return through the top cap terminal or through any pin other than the number 2 pin through which the filament or heater currents enter the tubes. The tester cannot be harmed by incorrect operation. Supreme tube testers are the only commercial tube testers which include all of these valuable features.

The verichromed bakelite panel is mounted in a beautifully-finished hardwood carrying case with a slip-hinged detachable cover in which is mounted the "Tube List" and "Operating Data" card. The tester is 5½x11¼x 12⅜" and weighs only 13 pounds and, when packed in a 9"x15"x16" air-cushioned carton, the shipping weight is 15 pounds. For 98/125-volt, 60-cycle power supply unless otherwise ordered at slight additional cost.

Telegraphic Code Word
SUSAT

DEALER'S NET CASH WHOLESALE PRICE $34.95

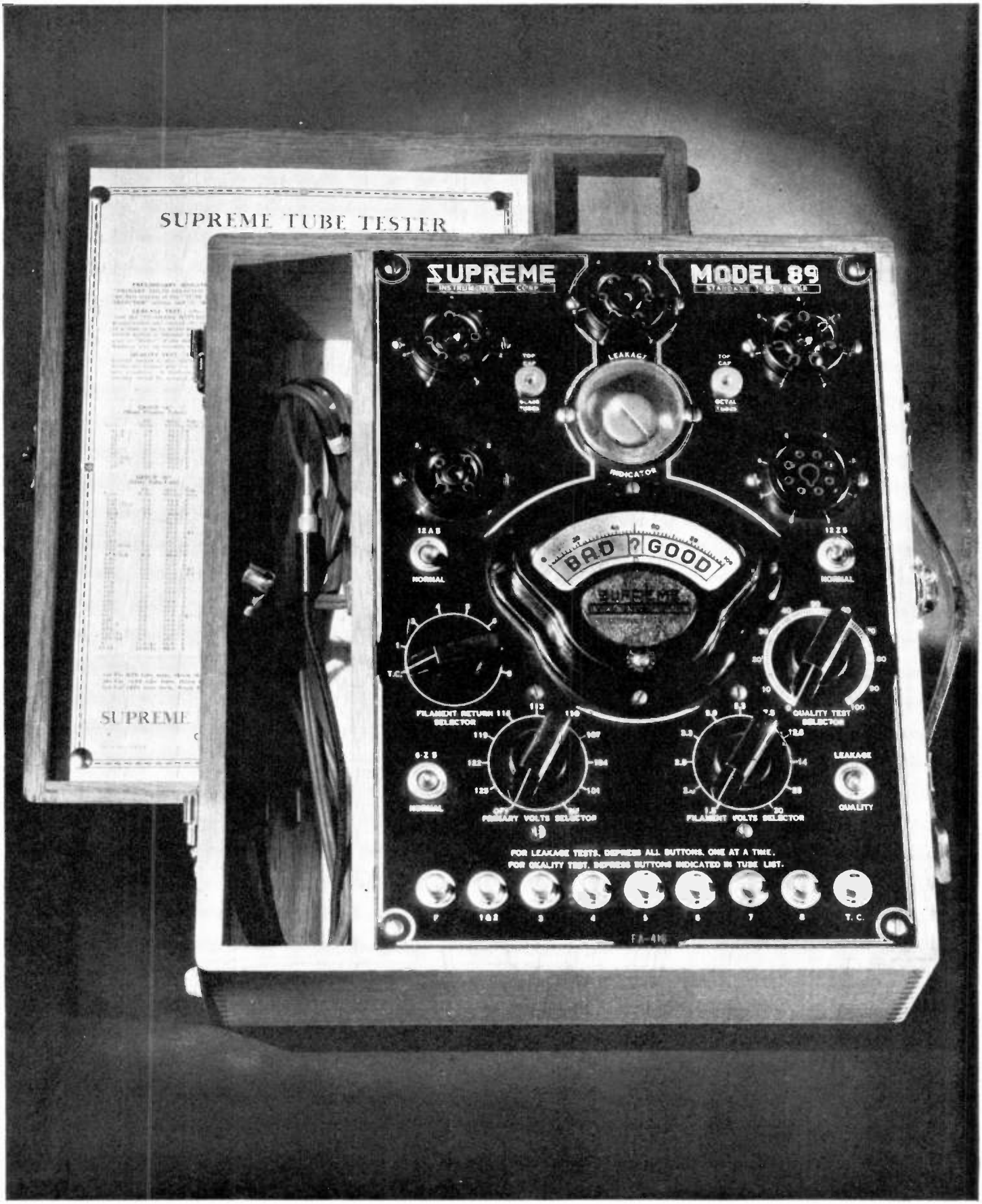
SUPREME 89 COUNTER DISPLAY TUBE TESTER

The Counter Display Model 89-C Tube Tester, which is illustrated on the back cover, is designed for the professional radioman who needs an extra tester for use in his store while his portable tube testers are being used on service calls, or for the radio dealer who does not make service calls and who wants an attractive display tester for his radio tube counter. The tube testing circuits of this tester are identical with those of the portable Models 89-S, 89-D and 385. This tester is housed in a beautiful two-toned walnut display case which harmonizes well with the furniture of the most modern store. The meter case and all other exposed bakelite parts are moulded of walnut-shaded bakelite to match the two-toned walnut case. All commercial receiving types of tubes which are in general use are listed, with correct and simplified testing procedure, on a "Tube List" card which is mounted in a sliding leaf, with drawer pull, at the base of the tester.

When packed in a 15"x15"x23" air-cushioned shipping carton, the shipping weight is 24 pounds. For 98/125-volt, 60-cycle power supply unless otherwise ordered at slight additional cost.

Telegraphic Code Word
SUCOT

DEALER'S NET CASH WHOLESALE PRICE $45.95


SUPREME TUBE TESTER
SUPREME
SUPREME
MODEL 89
LEAKAGE
INDICATOR
BAD ? GOOD
12A5
NORMAL
12Z5
NORMAL
6-Z5
NORMAL
FILAMENT RETURN SELECTOR
PRIMARY VOLTS SELECTOR
FILAMENT VOLTS SELECTOR
QUALITY TEST SELECTOR
LEAKAGE
QUALITY
FOR LEAKAGE TESTS, DEPRESS ALL BUTTONS, ONE AT A TIME.
FOR QUALITY TEST, DEPRESS BUTTONS INDICATED IN TUBE LIST.
T. C.

SUPREME 189 SIGNAL GENERATOR

Radio servicing equipment cannot be considered as being complete or up-to-date without a modern signal generator, and the new Supreme Model 189 Signal Generator is an outstanding value of modern design and quality workmanship.

While radios have been for some time available for operation in the high frequency or shortwave bands, it will be observed that the dial calibration for the high frequency bands is not as accurate as in the calibration for the lower frequency or broadcast bands, and that it is more difficult to select a station in the short wave bands. Although this condition is the result of a number of factors involved in the performance of high-frequency circuits, it is aggravated by the limitations of the present types of radio tubes which are available for high frequency tuning circuits. The capacity effect between the elements involved in the construction of a radio tube, while being negligible in low frequency circuits, becomes a considerable factor in high frequency circuits, simply because the reactance of any capacitive value is a function of the frequency of the electrical oscillations of the circuit in which the capacitive value is placed.

While apparently ignoring the factors which limit the consistent operation of high frequency circuits, including the frequency limitations of present types of radio tubes, some manufacturers are offering signal generators with fundamental tuning ranges at higher frequencies than those which will enable accurate and consistent calibration. The calibration of such signal generators is often found to change considerably with slight changes in the characteristics of the materials and tubes employed. When it is necessary to replace tubes in such signal generators, it may be found that the signal generators will no longer oscillate on one or more of the high frequency bands, or that re-calibration is necessary.

The objectionable conditions just described are practically eliminated in the new Model 189 Signal Generator by using harmonic coverage of the higher frequencies from 10 megacycles (30 meters) to 30 megacycles (10 meters), with complete fundamental coverage of intermediate and broadcast frequencies from 100 kilocycles (3000 meters) to 10 megacycles. In other words, the use of harmonics for extremely high frequencies enables the design and construction of the Model 189 Signal Generator which is more stable in frequency characteristics and which retains its original accuracy better when inevitable changes occur in the characteristics of the materials employed, or when it is necessary to replace the tubes involved in the tuned circuits.

The well-balanced electron-coupled circuit used in this signal generator provides unusual frequency stability over all ordinary variations in power supply potentials or load conditions. Actual tests have shown that a variation of as much as 50% can be made in the applied plate potentials without appreciably affecting the calibration. The carrier frequencies for the four tuning ranges are calibrated directly on a large airplane dial, thereby eliminating the usual extra charts and plotted curves. Accurate adjustment to the calibration of each signal generator is effected by means of "trimmer" or padding capacitors.

The Model 189 may be used either modulated or unmodulated. It is provided with a self-contained audio oscillator which modulates the carrier frequency about 50% and produces a 400-cycle audio "note." Provisions are included for external modulation with a microphone or phonograph pick-up. Three tubes are used, one as a radio-frequency oscillator, one as an audio frequency oscillator and one as a rectifier.

Several medium-priced and low-priced signal generators have been, and are being, offered in which the audio frequency component, only, of the output signals, is attenuated, leaving the radio frequency component unattenuated. While this method of attenuation enables a control of the loudspeaker or output meter strength of the generator output signals, the radio frequency load imposed upon the r.f. and A.V.C. stages of the radio is not attenuated. When the audio frequency component, only, is attenuated, the attenuation is really a control of the percentage of modulation from 0% to the maximum percentage. The r.f. carrier frequency output of the Model 189 is attenuated by means of a ladder-type attenuator with a multiplier switch and a variable control which is calibrated in relation to the signal output in microvolts, so that the strength of the output signals, after being passed through a radio, is determined by the strength of the r.f. carrier component, rather than by the strength of the radio component.

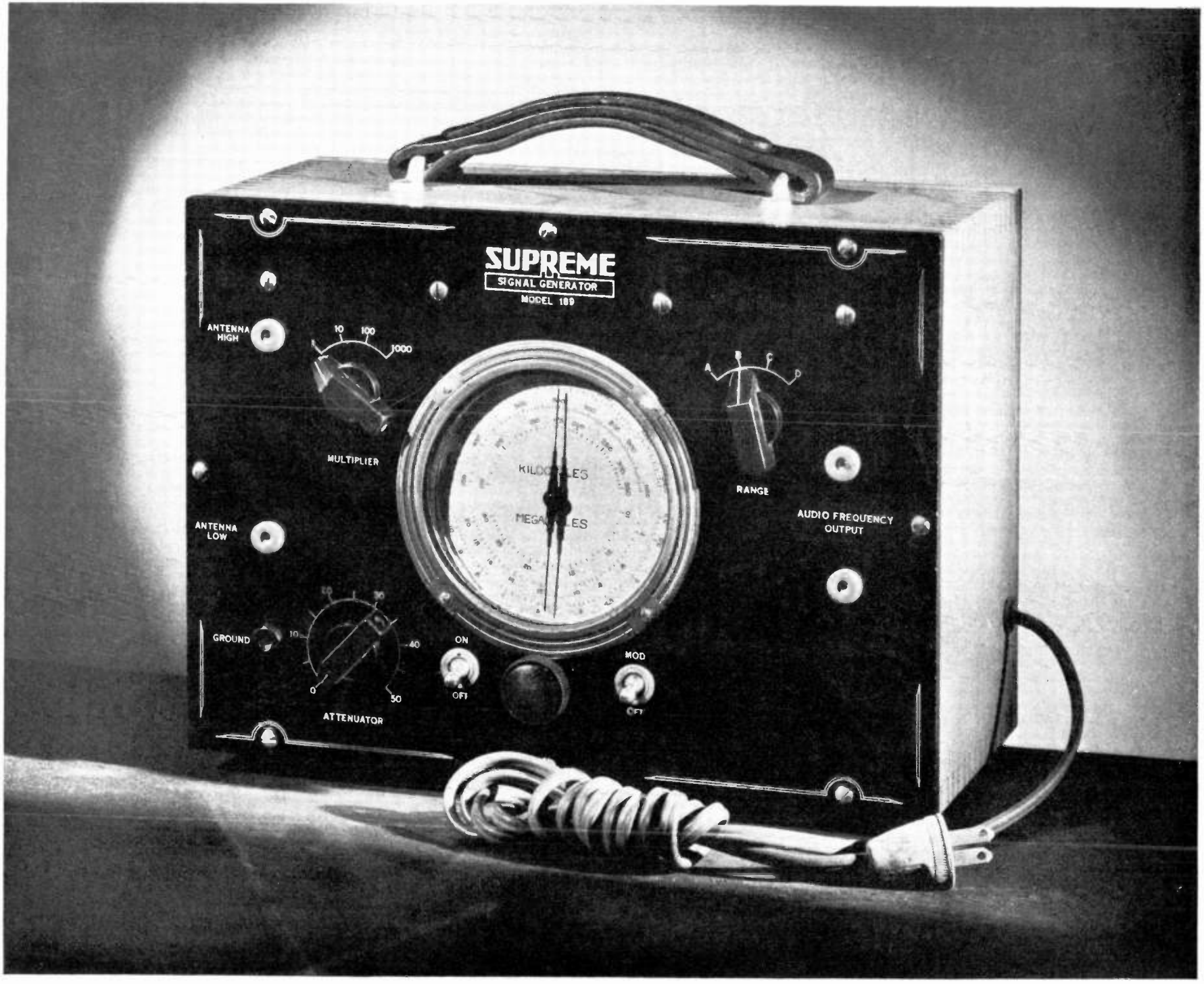
The audio modulation wave form approximates, very closely, the ideal of a sinusoidal wave form. Careful design in the method of coupling between the carrier and modulation circuits reduces, to a very low minimum, the amount of the "wobbulation" or frequency shift incidental to the variations in the potentials applied to the radio frequency oscillator resulting from the superimposed modulation potentials, so that extremely "sharp" and accurate tuning is assured.

The A.C. power supply cable is composed of moulded rubber over a flexible copper braid which completely shields the power supply conductors, and the individually-shielded units of the signal generator are surrounded with an over-all shielding which is fitted into a beautifully-finished hardwood case with a richly-finished and verichromed bakelite panel.

The signal generator is supplied, complete, with shielded dummy antenna, instructions, etc. The Model 189 measures 5⅜"x8½"x11¾" and weighs only 15½ pounds, and when packed in an 11"x13"x15" air-cushioned carton, the shipping weight is 20 pounds. For 110/120-volt, 60-cycle power supply unless otherwise ordered at slight additional cost.

DEALER'S NET CASH WHOLESALE PRICE $36.95

Telegraphic Code Word
SUGEN


SUPREME
SIGNAL GENERATOR
MODEL 189
ANTENNA HIGH
10
100
1000
MULTIPLIER
A
B
C
D
RANGE
ANTENNA LOW
AUDIO FREQUENCY OUTPUT
GROUND
10
20
30
40
50
0
ATTENUATOR
ON
OFF
MOD
OFF

BAD
GOOD
OCTAL TUBES
GLASS TUBES
FILAMENT-HEATER VOLTAGE
QUALITY TEST SELECTOR
FILAMENT RETURN SELECTOR
CIRCUIT SELECTOR