SERVICE INSTRUMENTS

Illustrations on Pages 79 and 80

Typical Full Size Scales on Page 78

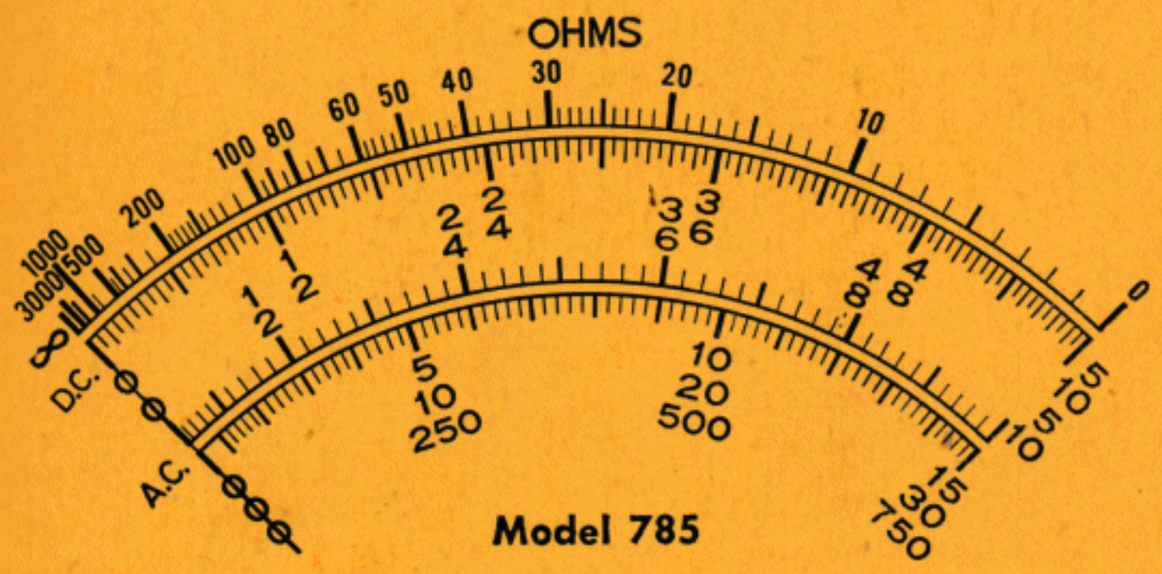
TEST EQUIPMENT

LIGHT MEASURING INSTRUMENTS

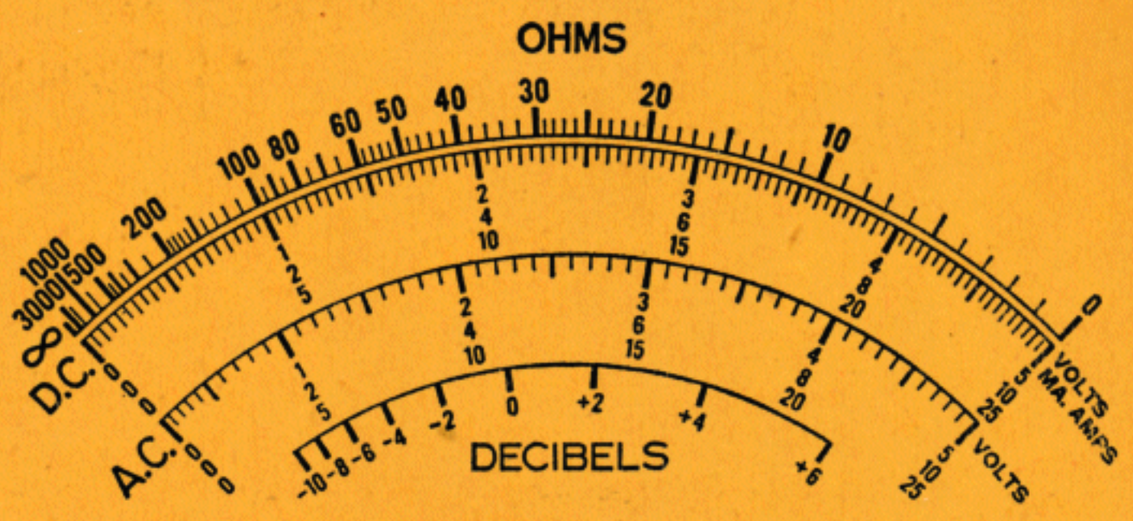
FOR GENERAL INDEX SEE PAGE 117

SERVICE INSTRUMENTS

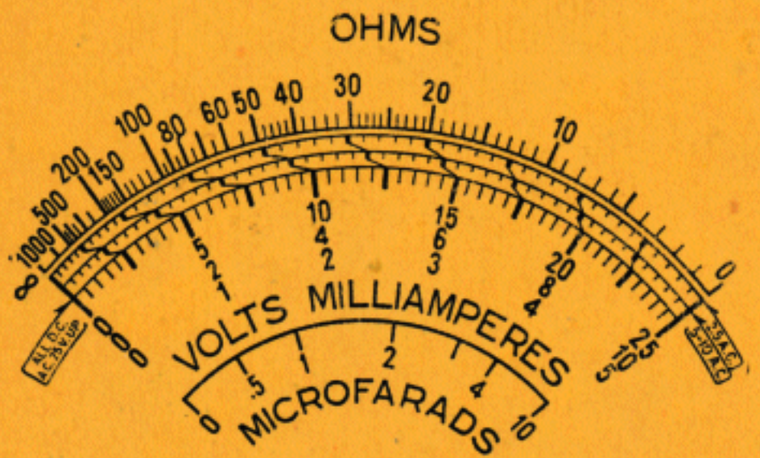
TYPICAL FULL SIZE SCALES



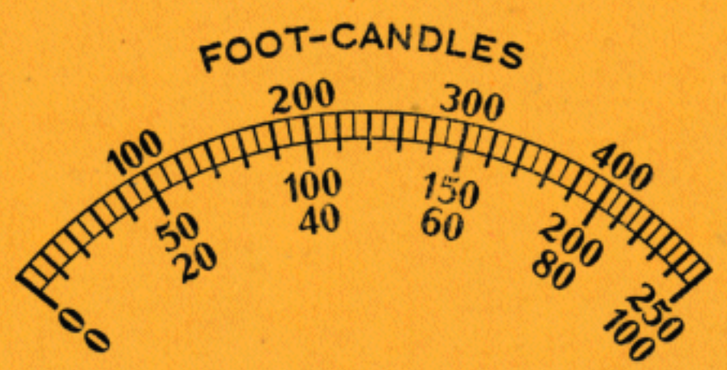
Model 785



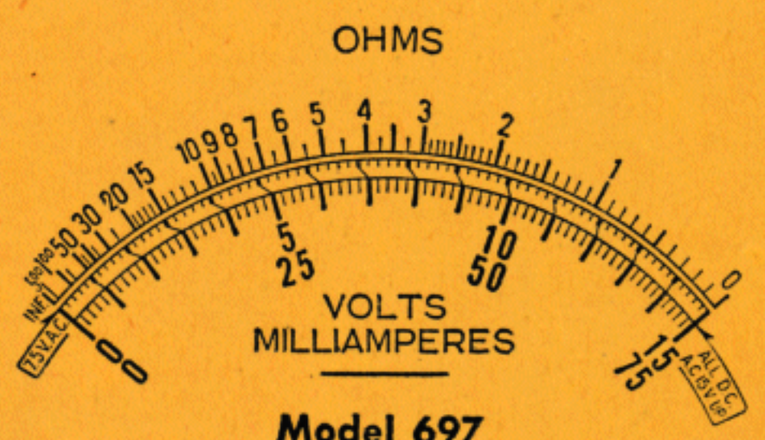
6 MILLIWATTS 0 LEVEL **Model 772, Type 2** 500 OHM LINE



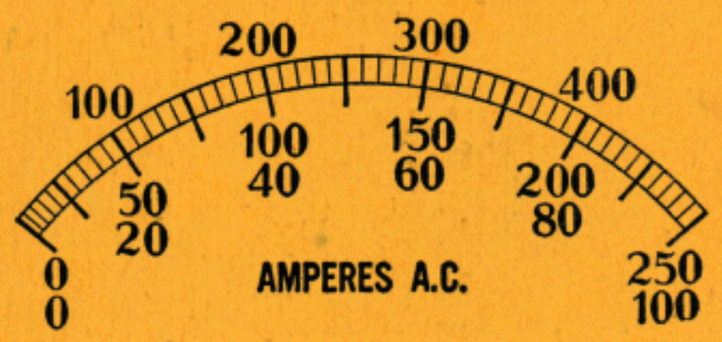
Model 665, Type 1



Model 614

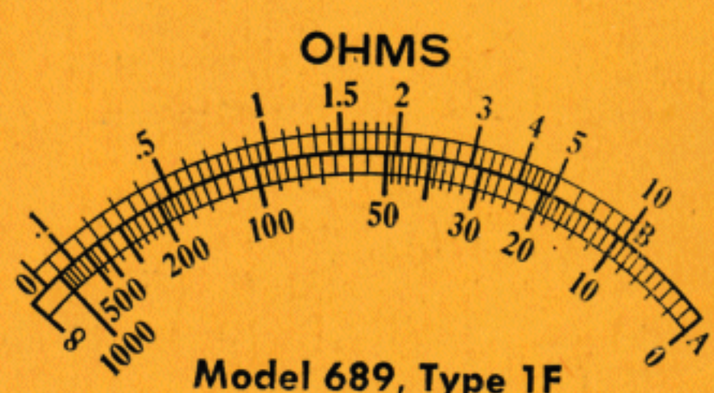


Model 697

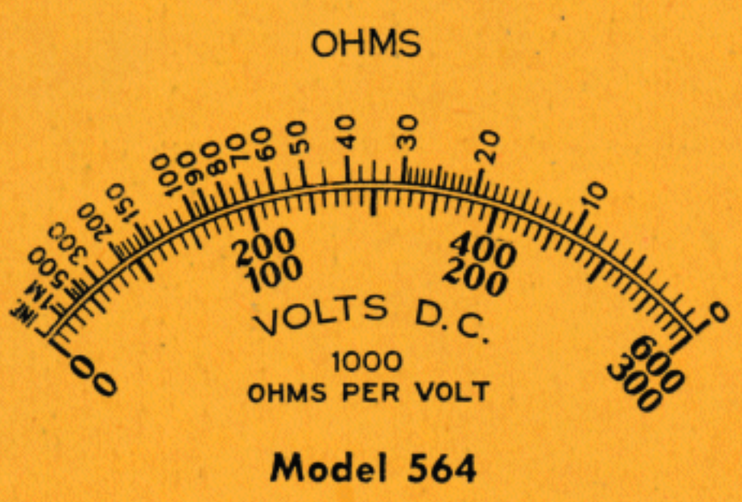


Model 633

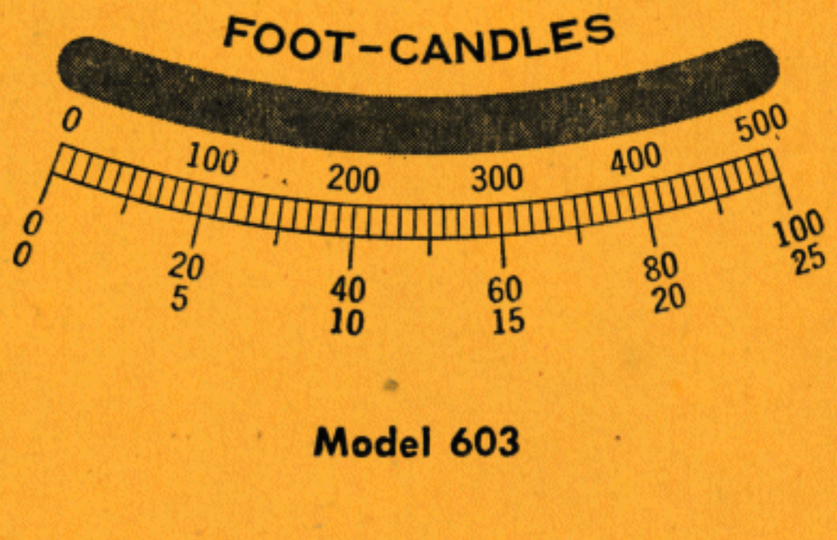
Model 703



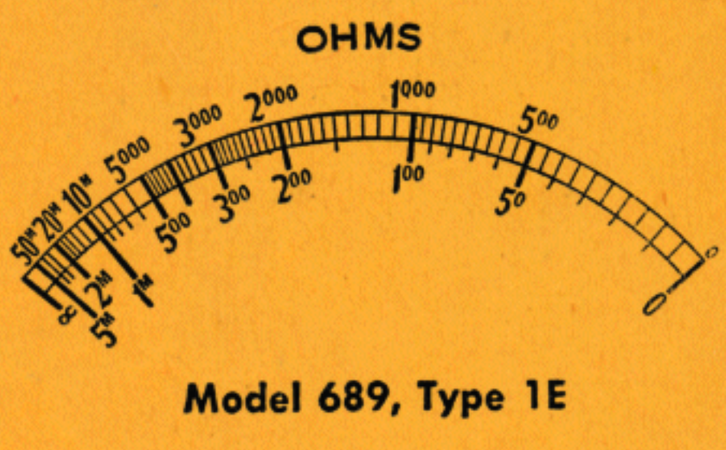
Model 689, Type 1F



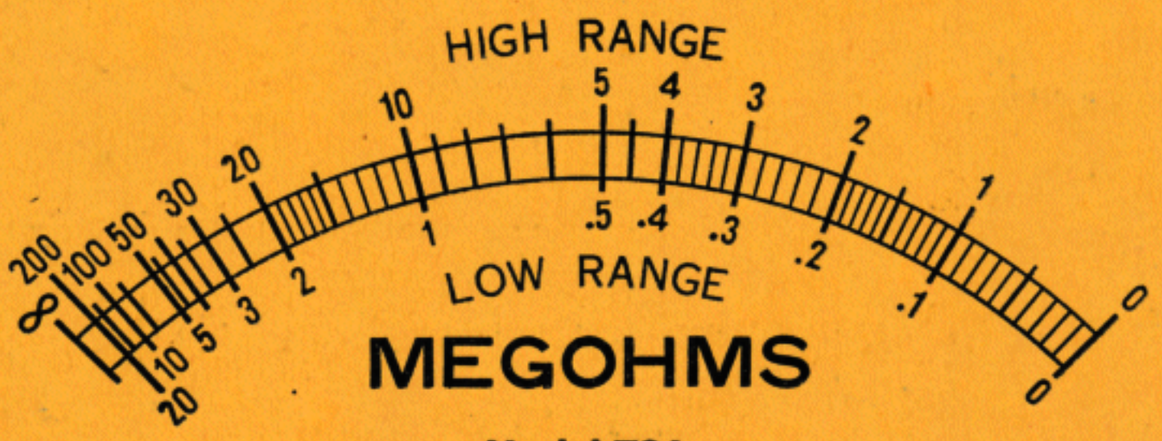
Model 564



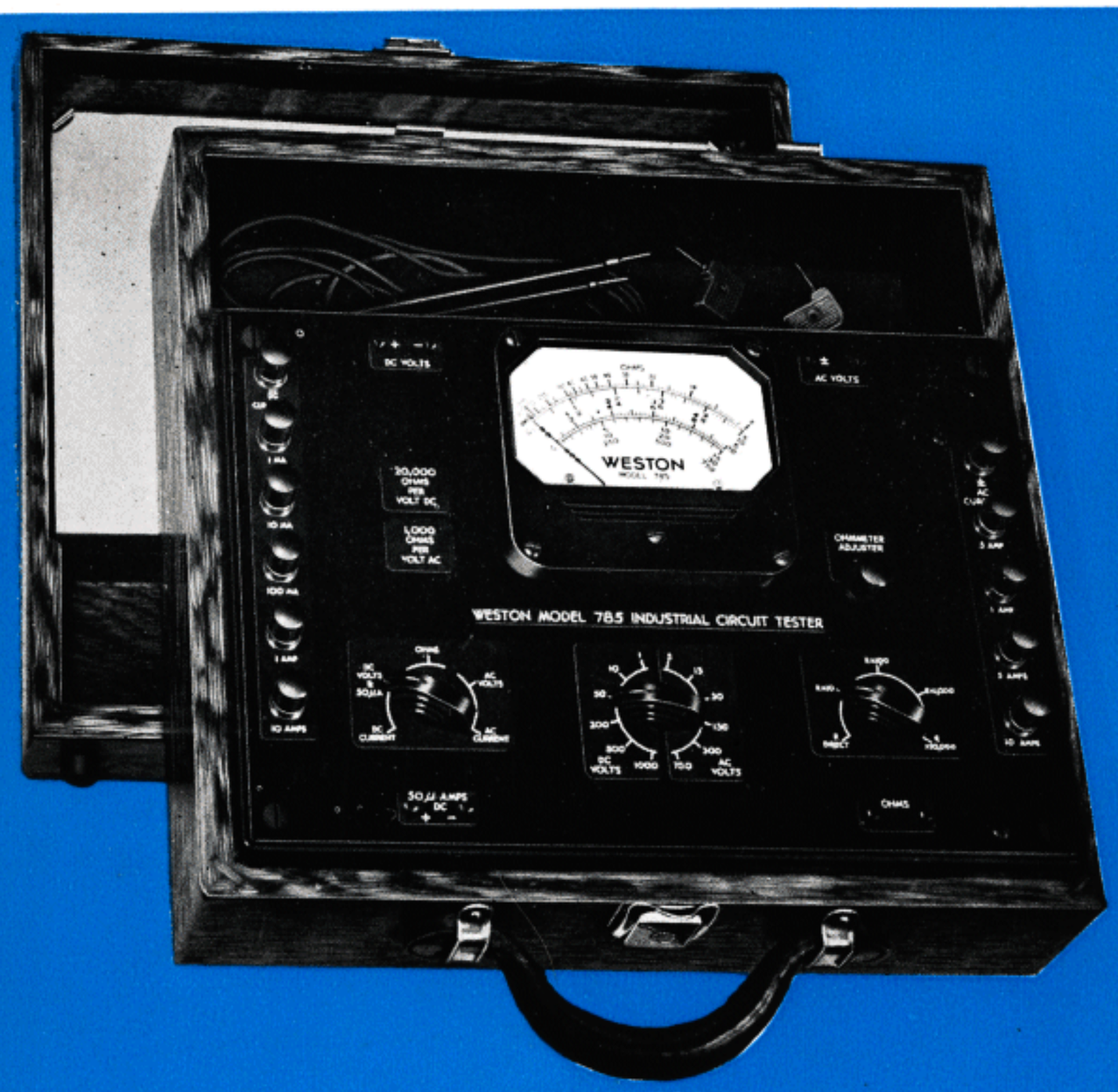
Model 603



Model 689, Type 1E

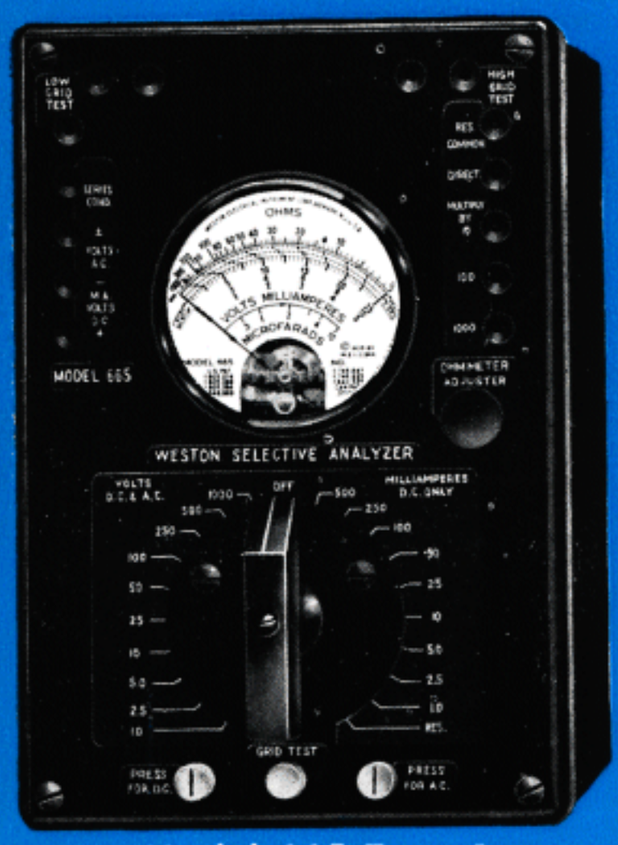


Model 796



Model 785
Industrial Circuit Tester

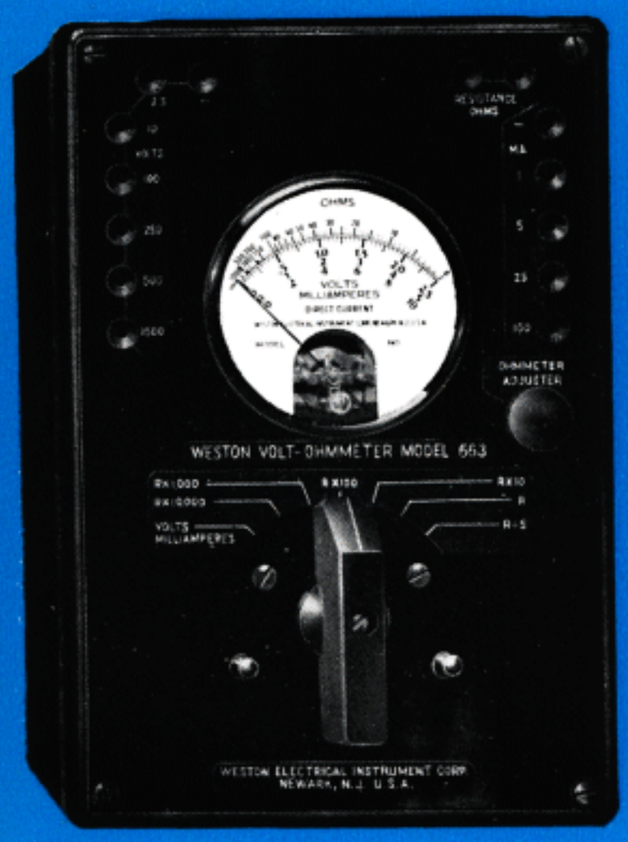
Model 772 Type 6 Analyzer



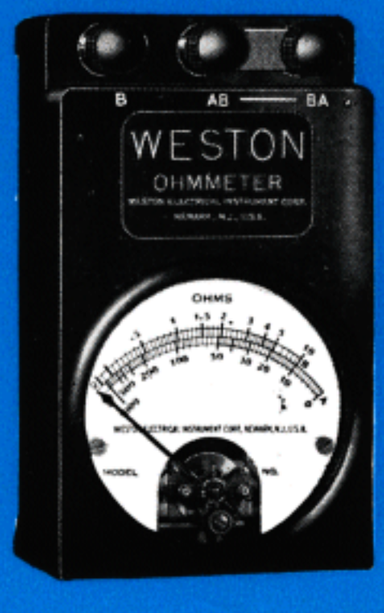
Model 665 Type 1
Volt-Ohm-Milliammeter

Model 796
Insulation Tester

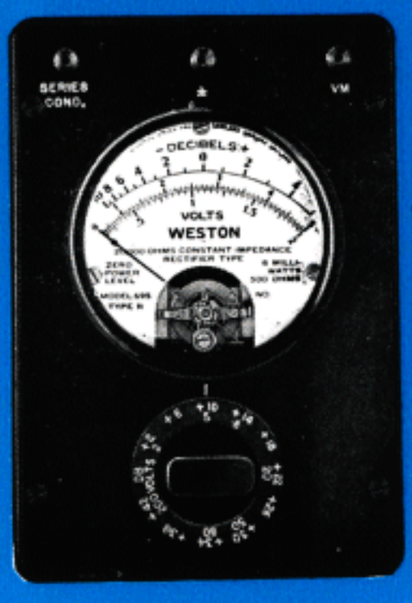
Model 697
Volt-Ohm-Milliammeter



Model 663
Volt-Ohm-Milliammeter



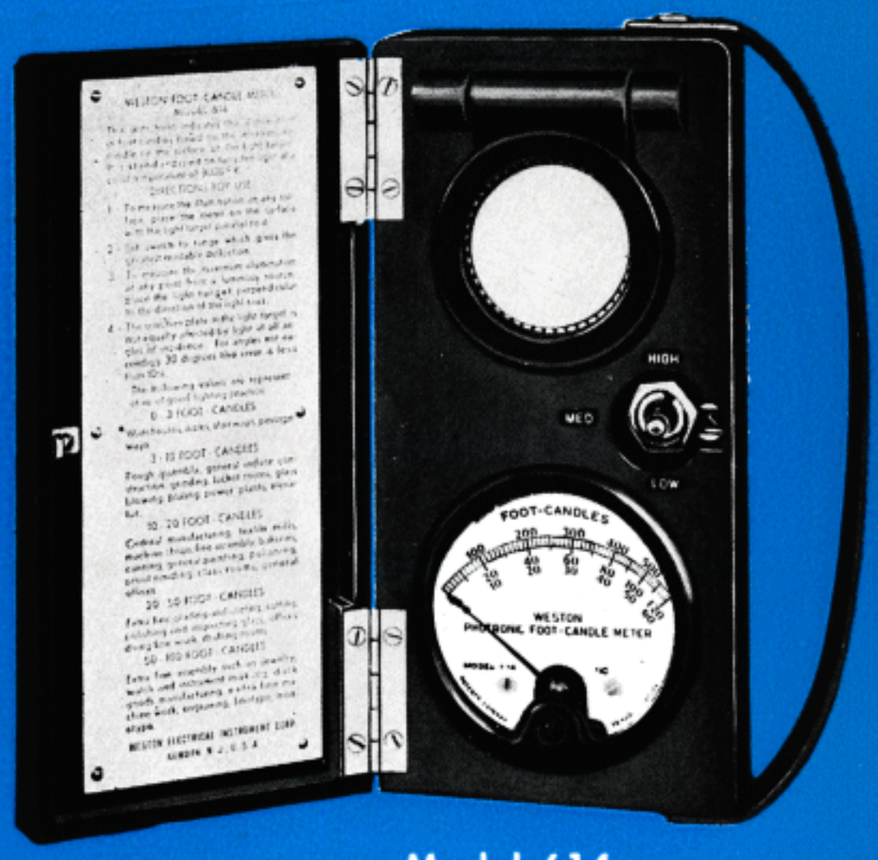
Model 689 Type 1F
Ohmmeter



Model 695 Type 11
Power Level Meter

Model 564 Type 3-C
Volt-Qhmmeter

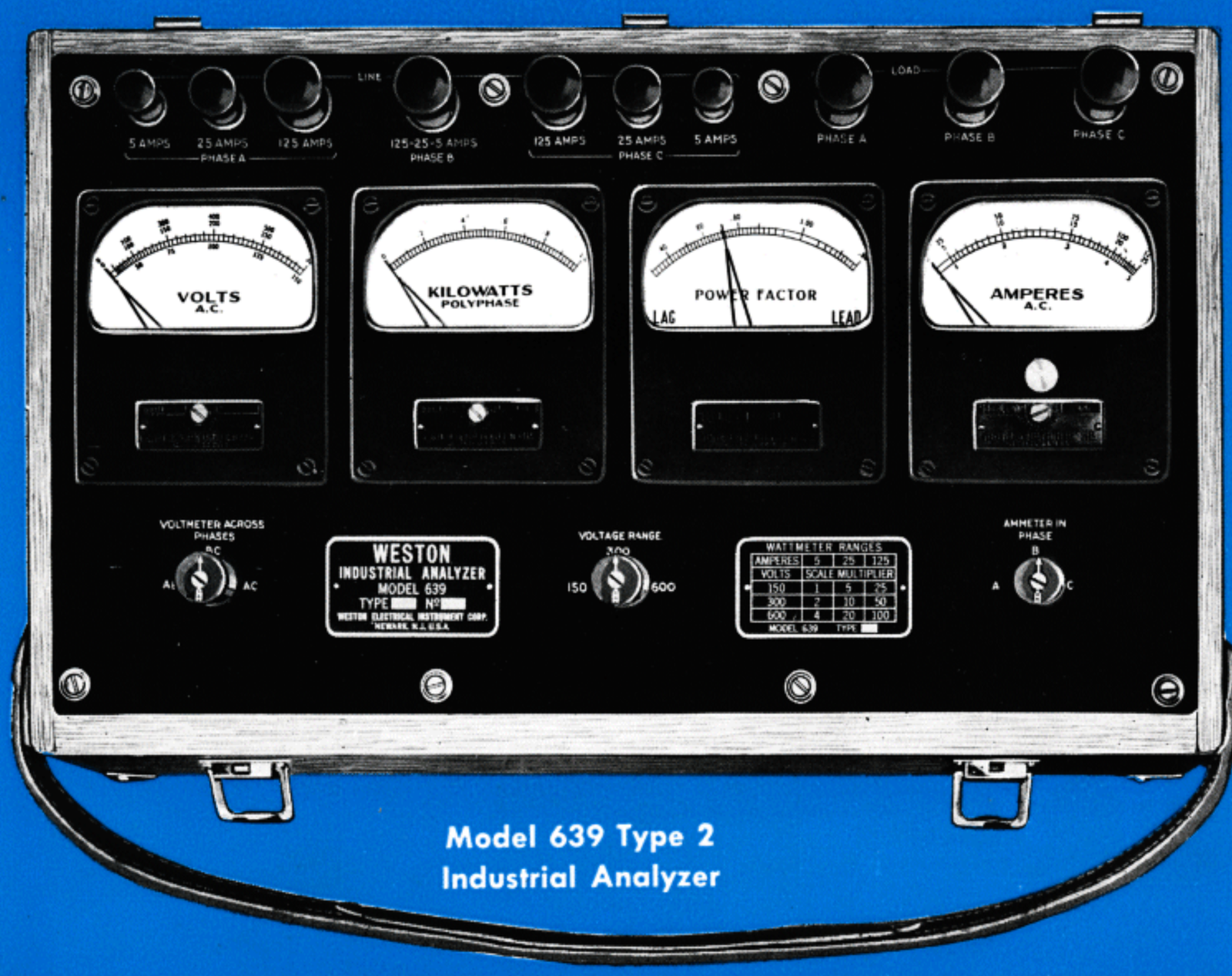
Model 603
Foot-Candle Meter



Model 614
Foot-Candle Meter

Model 703
Sight Meter

Model 799
Insulation Tester



Model 639 Type 2
Industrial Analyzer

Model 633
Clamp-Ammeter

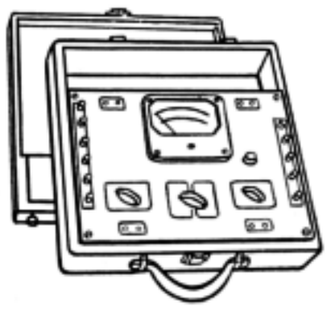
SERVICE INSTRUMENTS

INDUSTRIAL CIRCUIT TESTER— MODEL 785

Accuracy within:
2% on all d-c ranges except 1000 volts, 3%
3% on all a-c ranges at 60 cycles
5% on all a-c ranges from 25 through 800 cycles

Scale Length· 3.17" (80.3 mm)

Dimensions { 13 x 12½ x 5½" / 340 x 320 x 140 mm } ....Approx. Weight { 13½ lbs. / 6.12 kgs



The 785 Circuit Tester with its 27 ranges is an ultra-sensitive, multi-purpose instrument, which covers a broad range of electrical measurements. The widespread use of electronic devices, and sensitive relays in circuits for controlling industrial processes and automatic inspection, has created a definite need for this type of instrument. The critical measurements required in the servicing of these devices, as well as measurements in signalling and communication systems, photocell and oscilloscope circuits, aircraft radio and wiring systems etc. cannot accurately be made with instruments of ordinary sensitivity. While this test unit is designed specifically for these applications, its usefulness is by no means confined to sensitive circuit testing. The scope of its range includes general maintenance work, such as checking motors, lighting circuits, etc. which can be accomplished with a minimum waste of time.

Model 785 is especially useful for the wide variety of miscellaneous measurements encountered by power engineers, and agencies responsible for the maintenance of signal systems. All voltage, current and resistance measurements required when servicing network protectors, alarm systems, traffic controls, etc. can be made with this self-contained unit.

D-c voltage sensitivity is 20,000 ohms per volt. A self-contained battery provides potentials for resistance readings. Supplied with test leads.

The Model 766 Televerter extends the d-c voltage range to 5,000 volts. Use of Model 604 Current Transformer with the Model 785, increases the a-c current range; four ratios are available. The Model 792 Insulation Tester may also be used. The Model 785 will also accommodate Model 666, Type 1C, Socket Selector, which facilitates checking of tube circuit conditions in radio service work. Description of these accessories appears on page 85.

RANGES

Voltage D-C	Voltage A-C	Current D-C	Current A-C	Resistance Full Scale	Resistance Center Scale
1000	750	10 amps.	10 amps.	30 meg.	250,000 ohms
500	300	1 amp.	5 amps.	3 meg.	25,000 ohms
200	150	100 milliamps.	1 amp.	300,000 ohms	2,500 ohms
50	30	10 milliamps.	.5 amp.	30,000 ohms	250 ohms
10	15	1 milliamp.		3,000 ohms	25 ohms
1	5	50 microamps.			

Higher a-c ranges can be obtained by using current transformer listed on page 85.

Higher d-c ranges available through use of external 100 MV shunts priced below.

Ranges to 200 Amperes .....$ 9.00
250 Amperes 9.75
500 Amperes 16.50

Special shunt leads for Model 785.....$1.50 pr. net

Model 785, in oak carrying case.....Price $125.00 s

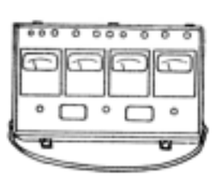
Model 785, in steel case for bench use.....Price $105.00 s

A-C INDUSTRIAL ANALYZER— MODEL 639, TYPE 2

Accuracy within:
Voltmeter and Ammeter—1%
Power Factor Meter—1%
Wattmeter—2%

Scale Lengths:
3.5" (89 mm) Each

Dimensions { 18⅞ x 10⅞ x 6⅞" / 479 x 276 x 175 mm } ....Approx. Weight { 32 lbs. / 14.5 kgs.



The Model 639 Industrial Analyzer has gained wide acceptance among plant maintenance men, utility service engineers, electrical contractors and those engaged in general industrial testing or installation work. Widely used in marine service. It is designed to analyze industrial loads by measuring current, voltage and power in single and polyphase circuits as well as power factor in 3-phase, 3 wire, balanced circuits.

Four Model 610 instruments; a Voltmeter, Wattmeter, Power Factor Meter and an Ammeter are included in its strong oak carrying case. The ammeter is equipped with an adjustable pointer stop which allows the maximum value of starting currents to be quickly determined.

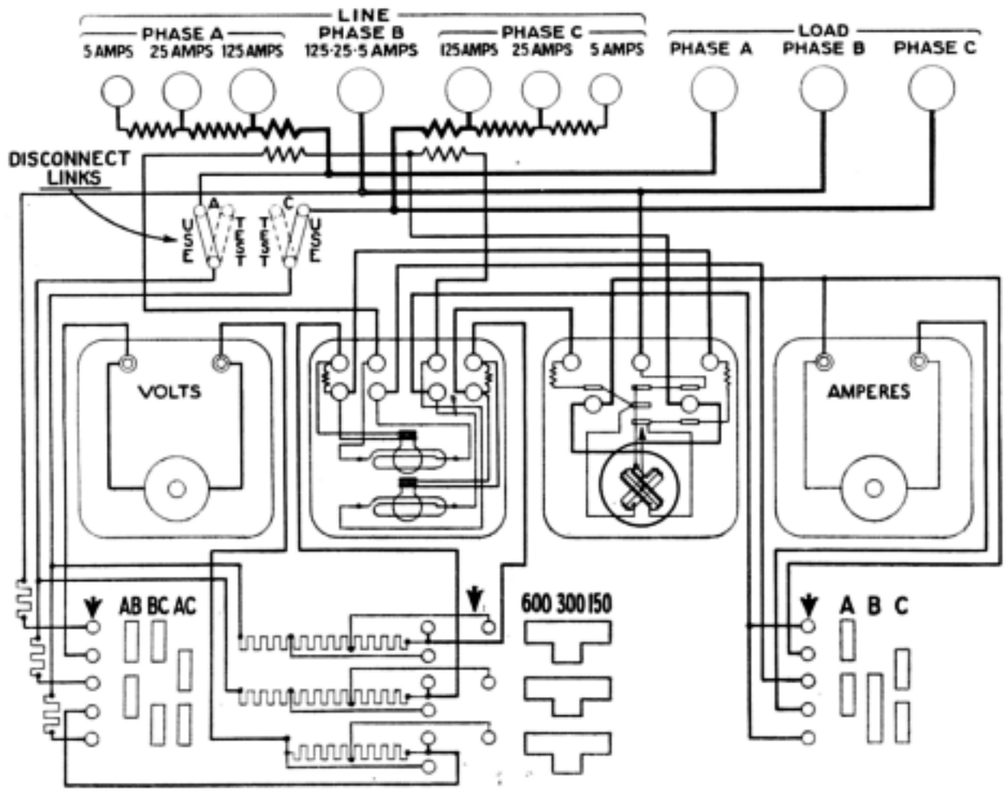
Only a few simple connections are necessary to place this instrument in circuit and the maze of interconnecting wires necessary when individual meters are used, is eliminated. Basic connection diagrams and operating instructions are contained in one card in the cover of the instrument. A pocket manual, containing additional connection diagrams and detailed information relative to the use of this analyzer, is also furnished.

Model 639 has self-contained potential ranges of 150/300/600 volts, current ranges of 5/25/125 amperes and corresponding wattmeter ranges. Current and potential transformers listed on pages 70 and 71 can be used for extending these ranges. Power factor indications are for 3-phase 3-wire balanced systems only: .30 lag through unity to .80 lead.

On 220 volt 3-phase circuits the 5 ampere range will take care of loads to 1 hp on the 2 kw scale; on the 25 ampere range up to 7½ hp on the 10 kw scale; on the 125 ampere range up to 40 hp on the 50 kw scale. At 440 or 550 volts the hp and kw ranges are doubled. Typical scales are shown on page 24.

A-C Industrial Analyzer, Model 639 Type 2.....$400.00 s

Internal Connections



Typical scales page 78

SERVICE INSTRUMENTS

A-C CLAMP-AMMETER—MODEL 633

Overall accuracy within 3%.....Scale 2.36" (60 mm)

Type A Dimensions { 13⅝" x 4⅜" x 2½" / 345 x 111 x 64 mm } ...Approx. Weight { 3¾" lbs. / 1.7 kgs. }

Type B Dimensions { 17¾" x 5⅞" x 2½" / 453 x 149 x 64 mm } .....Approx. Weight { 5 lbs. / 2.3 kgs. }

Rapid alternating current measurements on insulated or non-insulated conductors can easily be made with the Model 633 Clamp-Ammeter. It is only necessary to place the clamping jaws around the conductor, flick the thumb-switch to the proper range, and note the reading. This easy method of measuring current eliminates the necessity of breaking the circuit for the insertion of the conventional ammeter or current transformer.

The instruments listed all have six self-contained ranges. Type A can be used on cables up to 2" in diameter; Type B on conductors up to 4½" square. Full scale ranges below the lowest range on any instrument can be obtained by coiling the conductor and placing the clamping jaws around two or more turns of the coil. For example: on Model 633 Type A-1, two turns produce 5 amperes full scale; four turns, 2.5 amperes full scale; etc.

The Weston Clamp-Ammeter was carefully designed for the safety and convenience of the operator. In addition to its obvious advantages over conventional methods of measuring current, Model 633 provides a flexibility of range selection which suits it for a wide variety of applications.

Insulation: In order to guard against the danger of shorting to adjacent conductors when taking a current measurement, the laminated clamping jaws of Model 633 are insulated with a heavy rubber sleeve. Internally, the instrument is fully insulated for maximum protection and the switch handle is of solid bakelite construction. The complete assembly is tested for voltage breakdown at 3700 volts, a-c.

Magnetic Circuit: The spring action of the jaws assures a positive closure of the magnetic circuit. Jaw surfaces are accurately machined, easy to clean and, because of the simple, sturdy clamping arrangement, are assured of perfect alignment. The complete instrument can be safely hung on the conductor, thereby freeing the operator's hands for making notes, adjustments, etc. Measurements in crowded or cramped locations, as on the back of a panel board, can easily be made as only ¾" clearance behind the conductor is necessary.

Remote Readings: The instrument can be removed from the housing for the purpose of taking readings at a distance from the conductor. Measurements such as this are accomplished by removing the instrument from the housing and inserting it in a receptacle attached to one end of an extension cable. (See illustration below.) The plug attached to the other end of the cable is then inserted in the clamp housing. Readings can then be taken at a distance when the clamping jaws are placed around the line.

"Hot Stick" Readings: The Weston Clamp-Ammeter can be used with a "hot stick" for current measurements on high voltage lines. Extension poles equipped with clamp-ammeter adapters are available at electrical jobbers. The clearly marked scale, pear shaped pointer and damping of the instrument movement are all factors which facilitate measuring current values when the instrument is read at a distance.

***RANGES AND PRICES**

Type A-1 s	500/ 250/100/ 50/ 25/10 amperes	$110.00
A-2 s	1000/ 500/250/100/ 25/10 amperes	120.00
A-3 s	2000/1000/500/250/100/50 amperes	130.00
B-5	1000/ 500/250/100/ 50/25 amperes	155.00
B-3	2000/1000/500/250/100/50 amperes	160.00

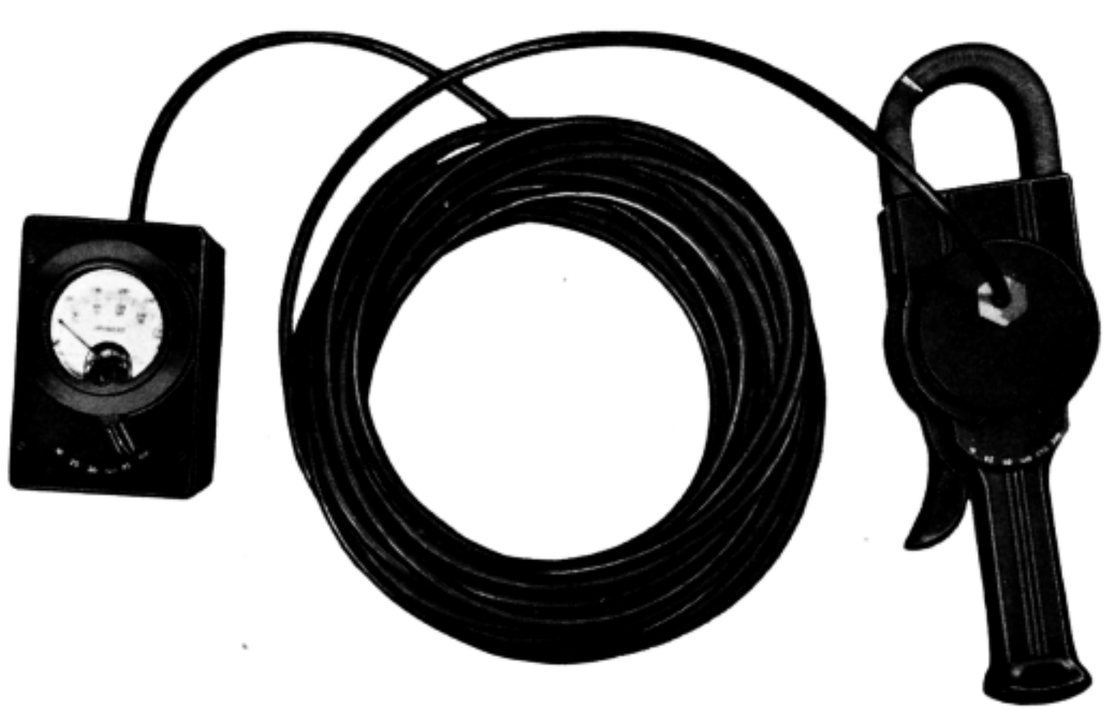
*Model 633 cannot be used for continuous duty on ranges above 750 amperes.

All types are available on special order with adjustable pointer stop which allows the maximum value of starting current to be quickly determined. Surcharge for adjustable pointer stop: $10.00.

50 ft. cable, plug, and receptacle	$40.00 s
Leather carrying case for clamp-ammeter	12.00 s
Leather carrying case for cable, plug, and receptacle	15.00 s

Ready for Use

Model 633 with 50 Foot Extension Cable



Model 633 Type B

s *Denotes instrument normally carried in stock.*

Typical scales page 78

ANALYZER—MODEL 772, TYPE 6

Accuracy: 2% on all d-c ranges except 1000 volts, 3%.
3% on all a-c ranges.

Scale Length: 3.17" (80.3 mm)

Dimensions { 15⅛ x 5⅛ x 8¾" / 384 x 120 x 222 mm } .....Approx. Weight { 9 lbs. / 4 kgs.

Sensitivity of 20,000 ohms per volt on d-c permits accurate measurements on radio and television receivers and transmitters, cathode ray equipment, telephone, telegraph, photoelectric and sensitive relay circuits. A-c sensitivity, 1000 ohms per volt. All ranges listed are self-contained. D-c voltage range can be extended to 5,000 volts by using the Model 766 Televerter. The Model 792 Insulation Tester may also be used. The Model 772 Analyzer will accommodate Model 666, Type 1C Socket Selector, which facilitates checking of tube circuit conditions in radio service work. Description of these accessories appears on page 85. Self contained battery provides potentials for resistance readings. Descriptive literature available upon request.

RANGES

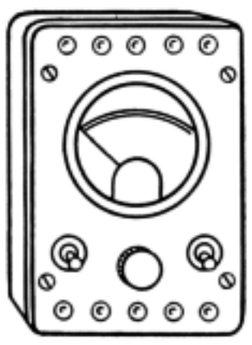
Voltage D-C and A-C	Current D-C Only	Resistance: Full Scale	Resistance: Center Scale	Decibels
1000	10 amps.	30 meg.	250,000 ohms	—14 to + 2
250	1 amp.	3 meg.	25,000 ohms	— 2 to +14
50	250 milliamps.	30,000 ohms	250 ohms	+12 to +28
10	50 milliamps.	3,000 ohms	25 ohms	+26 to +42
2.5	10 milliamps.			+38 to +54
	1 milliamp.			
	100 microamps.			

Model 772, Type 2 Analyzer.....Price $66.00 s

VOLT-OHM-MILLIAMMETER—MODEL 697

Accuracy 2% on d-c, 5% on a-c.....Scale Length 2.36" (60 mm)

Dimensions { 5 9/16 x 3¾ x 3 9/16" / 141 x 95 x 65 mm } .....Approx. Weight { 1¾ lbs. / .79 kg.



Model 697 Volt - Ohm - Milliammeter combines a selection of a-c and d-c voltage, direct current and resistance ranges in a light weight, pocket size case. Ranges have been carefully selected to cover the majority of maintenance testing and inspection needs. The indicating instrument is a full sized 3¼ inch meter. All a-c and d-c ranges have a sensitivity of 1000 ohms per volt. Model 666 Type 1C Socket Selector, described on page 85 may be used to facilitate checking of tube circuit conditions in radio service work. A self-contained battery provides potentials for ohm ranges. Test leads furnished. Descriptive literature available upon request.

RANGES

Volts A-C and D-C	Milliamperes D-C	Ohms: Full Scale	Ohms: Center Scale
750	75	500,000	3,500
150	7.5	5,000	35
15			
7.5			

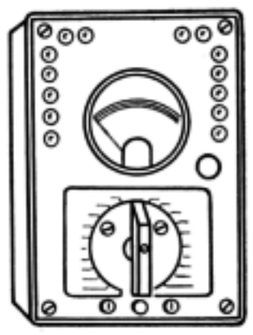
Model 697 Volt-Ohm-Milliammeter.....Price $32.00 s
Carrying Case (Described on page 85)..... 7.00 s

s *Denotes instrument normally carried in stock.*

VOLT-OHM-MILLIAMMETER—MODEL 665, TYPE 1

Scale Length: 2.36" (60 mm)

Dimensions { 5½ x 8¼ x 3 27/32" / 140 x 210 x 98 mm } .....Approx. Weight { 5 lbs. / 2.3 kgs.



Designed for rapid production testing on electrical equipment and parts as well as for maintenance and laboratory work. Simplified switching and pin-jack arrangement facilitates quick selection of 33 well-overlapped ranges. Ideal for portable or bench use. All ranges have a sensitivity of 1000 ohms per volt. Output measurements are made through a self-contained fixed condenser. Potentials for ohm ranges provided by self-contained batteries. Test leads furnished. Descriptive literature available upon request.

RANGES

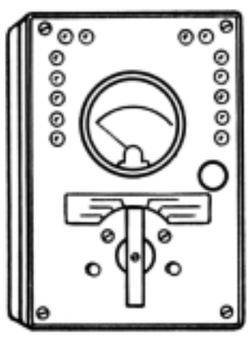
Volts* A-C and D-C	Ohms: Full Scale	Ohms: Center Scale	Milliamperes D-C Only
1000	1,000	25	500
500	10,000	250	250
250	100,000	2,500	100
100	1,000,000	25,000	50
50			25
25	Accuracy—2% on d-c ranges		10
10	5% on a-c ranges		5
5			2.5
2.5	A-c output ranges 1 to		1
1	1000 volts.		
	*All 1000 ohms per volt		

Model 665, Type 1, in steel case for bench use.....Price $78.00 s
Carrying Case (Described on page 85)..... 5.50 s

VOLT-OHM-MILLIAMMETER—MODEL 663

Accuracy 2% on all ranges.....Scale Length 2.36" (60 mm)

Dimensions { 8¼ x 5½ x 3 27/32" / 210 x 140 x 98 mm } .....Approx. Weight { 4½ lbs. / 2.04 kgs.



Model 663 is widely used for general industrial and experimental work where a broad range of resistance measurements, in combination with d-c voltage and current ranges, is desired. Its convenient switching and pin-jack arrangement makes it exceptionally suitable for laboratory, school or industrial use. Resistance ranges are selected by the rotary switch while current and voltage ranges are available at the pin-jacks. The low current drain of the instrument (50 microamperes for full scale deflection) permits the measurement of high resistance values at a low test potential. Supplied complete with test leads and self-contained battery.

RANGES

Ohms: Full Scale	Ohms: Center Scale	Milliamperes D-C	Volts D-C
200	5	1	2.5
1,000	25	5	10
10,000	250	25	50
100,000	2,500	100	250
1,000,000	25,000	.....	500
10,000,000	250,000	.....	1,000

Model 663 in steel case for bench use.....Price $65.50 s
Carrying Case (Described on page 85)..... 5.50 s

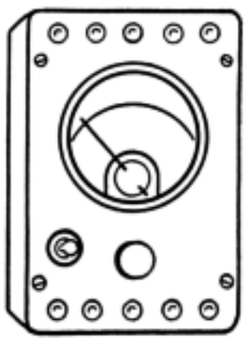
Typical scales page 78

SERVICE INSTRUMENTS

VOLT-OHMMETER—MODEL 564, TYPE 3-C

Accuracy within 2%.....Scale Length 2.36" (60 mm)

Dimensions { $4\frac{33}{64}$ x $3\frac{45}{64}$ x $2\frac{9}{16}$" / 140 x 94 x 65 mm } .....Approx. Weight { 1¾ lbs. / .79 kg.



Model 564 is a pocket-size tester having a broad selection of resistance and d-c voltage ranges. Ranges are available from pin-jacks molded in the bakelite panel, a toggle switch being used to connect the meter in circuit as a voltmeter or ohmmeter. All voltage ranges have a sensitivity of 1000 ohms per volt. The indicating instrument is a full sized 3¼ inch meter. A self-contained battery provides the necessary potential for the ohm ranges. Test leads furnished.

RANGES

D-C Volts	Ohms — Full Scale	Ohms — Center Scale
600	1,000,000	35,000
300	100,000	3,500
30	10,000	350
3	1,000	35

Model 564, Type 3-C.....Price $38.40 s

Carrying Case (Described on page 85)..... 7.00 s

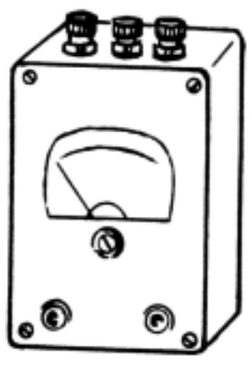
INSULATION TESTER— MODEL 799

Accuracy: Within ⅛" of scale length

Scale Length 2.375" (60.3 mm)

Dimensions { 3 3/16" x 5¼" x 5" / 86 x 133 x 127 mm / (over binding posts) } .....Approx. Weight { 3.8 lbs. / 1.7 kgs.

Range: 0-10,000 megohms (logarithmic scale)



The Model 799 insulation tester is a small compact device embodying a Model 301 microammeter, a vacuum tube and associated small batteries. It operates on the grid current characteristic and is an extremely sensitive resistance measuring assembly for a wide variety of purposes. The circuit arrangement is such that high accuracy is sacrificed to a very broad coverage of from .1 to 10,000 megohms and its use is indicated where the order of the leakage resistance is wanted rather than exact values. Less than 22½ volts are applied to the resistance under test.

Because of the extreme sensitivity, measurements may be made of leakage resistance with practically no polarization effects in most cases.

Leakage resistance of built-up equipment, such as motors, control equipment generally, as well as electronic equipment, can be made without destructive breakdown. Cables and wiring can be tested for leakage and in many cases impending breakdowns can be predicted.

The testing of mica and paper condensers with the Model 799 will show those units which have low leakage resistance and faulty condensers can readily be eliminated with consequent elimination of difficulties in assembled apparatus.

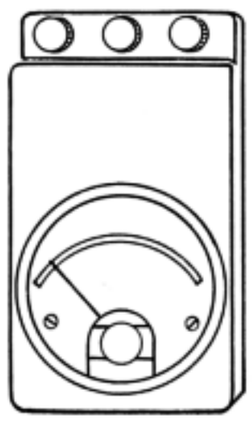
The vacuum tube used is the 1LH4 . . . the filament battery is 1½ volts . . . and the plate battery is 67.5 volts, all self contained.

Model 799, complete with leads, tube, batteries, and oak carrying case $55.00

OHMMETER—MODEL 689, TYPES 1E AND 1F

Accuracy within 2%.....Scale Length 2.36" (60 mm)

Dimensions { 5 x 2⅞ x 1⅞" / 125 x 73 x 47.6 mm } .....Approx. Weight { 1 lb. / .45 kg.



Model 689 is a very convenient pocket-sized instrument for the resistance and continuity method of checking circuits. The indicating instrument is a full sized 3¼ inch meter. A self-contained battery provides the necessary potentials for resistance readings.

Type 1E ohmmeter has a double range of 0-5,000 and 0-50,000 ohms.

Type 1F ohmmeter also has a double range of 0-10 and 0-1,000 ohms for the accurate measurement of low resistance values. This type is widely used for production and maintenance testing of armature and field resistance of small motors, relay and coil testing, transformer winding tests, and other similar applications.

RANGES

Ohms — Full Scale	Ohms — Center Scale
50,000	1,250
5,000	125

Model 689, Type 1E (including test leads).....$18.00 s

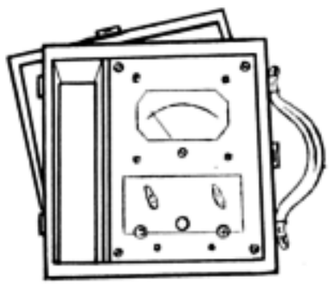
Model 689, Type 1F (including test leads)..... 20.00 s

Carrying Case (Described on page 85)..... 5.50 s

INSULATION TESTER— MODEL 796

Accuracy within 2%.....Scale Length: 3.27"—(86 mm)

Dimensions { 8⅜" x 9⅛" x 8" deep / 213 x 232 x 203 mm } Approx. Weight Including batteries { 15 lbs. / 6.8 kgs.



The constant check of insulation resistance has long been recognized as the most complete insurance against costly equipment failure.

This compact readily portable tester provides complete insulation and resistance tests up to 200 megohms at a test potential of 350 to 500 volts d-c.

The operator has the freedom of both hands, through elimination of the inconvenient hand crank generator.

Although the test potential is 500 volts at the terminals, the current is only a few microamperes. It is therefore impossible, under normal conditions, for the operator to receive any harmful shock.

It operates from self contained, long life, lightweight batteries, and there are no vibrators or tubes to replace.

Model 796 can also be used for general resistance measurements from 10,000 ohms to 200 megohms.

RANGES

0-20-200 megohms	full scale
0-.5-5 megohms	center scale

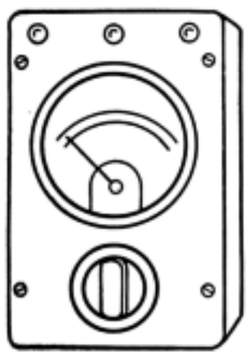
Model 796 .....$100.00

SERVICE INSTRUMENTS

POWER LEVEL METER—MODEL 695, TYPE 11

Accuracy 5%.....Scale Length 2.36" (60 mm)

Dimensions { $5\frac{33}{64}$ x $3\frac{45}{64}$ x 3½" / 140 x 94 x 79 mm }.....Approx. Weight { 1½ lbs. / .68 kg.



Model 695 is a rectifier type voltmeter providing readings in decibels and volts for power level measurements in all types of speech equipment and radio receivers. Model 695 has seven a-c voltage ranges from 2 to 200 volts, and eleven db ranges providing a total spread of 55 db. It is adjusted for a zero level of 6 milliwatts in a 500 ohm line. Interpolation values are furnished for other line impedance from 5 ohms to 10,000 ohms. The instrument has a constant impedance of 20,000 ohms on all ranges, as well as a constant impedance across the meter terminals, resulting in uniform accuracy on all db ranges.

A self-contained condenser, available through a separate pin-jack, is provided for blocking out d-c. Supplied with a pair of test leads. For additional data on power level measurements, see page 66.

Model 695, Type 11.....Price $38.00 s
Carrying Case ..... 7.00 s

WESTON TUBECHECKERS

Weston manufactures a complete line of commercial tubecheckers for testing all types of standard vacuum tubes. These devices are widely used by radio service organizations for checking and selling tubes, and by governmental agencies, industrial plants, etc. Although designed primarily for use in the radio field, they are now recognized as an important maintenance tool wherever electronic control and communication equipment is employed.

Tubes are tested under proper load as recommended by the Radio Manufacturers' Association. Both emission and mutual conductance tubecheckers are available.

Rapid changes and new designs in vacuum tubes are continuously affecting tube tester design. Weston Tubecheckers have always been engineered to provide "minimum obsolescence".

In addition to the Model 686, Mutual Conductance Tubechecker shown on page 86, other lower priced models are also available. Complete details furnished upon request.

ACCESSORIES FOR SERVICE INSTRUMENTS

Model 766 Televerter for 5000 Volts

D-c voltage ranges of Model 785 or Model 772 can be extended to 5,000 volts through the use of Model 766 Televerter or Multiplier.

The Televerter and leads afford ample protection as they have been made in accordance with A.I.E.E. dielectric specifications.

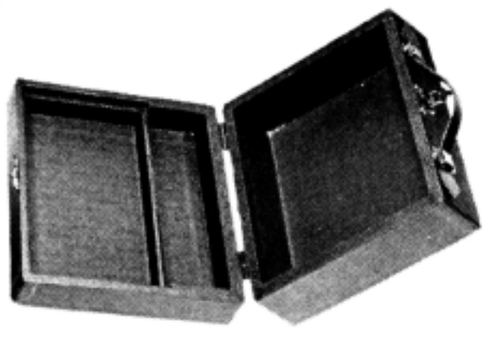
List Price—Model 766.....$25.00

Insulation Tester Model 792

Insulation and cable resistance measurements up to 900 megohms can be made when Model 792 is used with the Model 785 or Model 772.

This device operates from any 110-130 volt, 50 to 60 cycle line . . . and the resistance measurements are made at a test potential of 500 volts as recommended by the A.I.E.E.

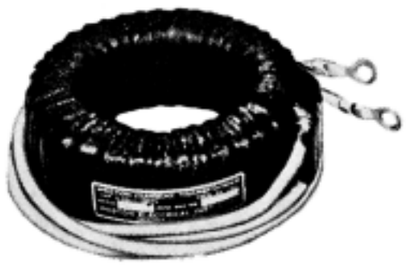
List Price—Model 792.....$32.50



Carrying Cases for Models 665 and 663

For portable use of Models 665 and 663, it is recommended that a wooden carrying case, with waterproof fabricoid cover be purchased with the instrument. A compartment for test leads or small tools is built into each case. Please specify model number of the instrument with which it will be used, when ordering.

List price of carrying case.....$5.50



Current Transformer Model 604

Model 604, an inserted primary type of current transformer, can be used to increase the a-c current range of the Model 785. Its accuracy is within 1% on frequencies from 60 to 125 cycles . . . capacity 2 volt-amperes.

Available in ratios of 200:5, 300:5, 400:5, 500:5.

List Price—Model 604.....$12.00

Socket Selector Model 666 Type 1C

The selector block mounts mechanically on any analyzer by means of two pin terminals. With the tester plug inserted in the radio set socket and the tube in the Selector Socket, tube circuit conditions (voltage, current, resistance) can be checked by plugging in jumper cables from the jacks on the selector block to the analyzer jacks or binding posts. The pin jacks are marked with the RMA tube base numbers. A comprehensive tube base chart is furnished. All adapters are supplied including octal, loctal and miniature types.

Model 666 Type 1C.....$21.10

Leather Carrying Cases for Models 564-689-695-697

It is recommended that these pocket size instruments be housed in leather cases, when stored on the shelf, or when being transported on the job. This procedure will insure longer lasting service.

When ordering please specify the model numbers of the instruments with which they are to be used.

Carrying case for Model 689.....$5.50
Carrying case for Model 564-695-697 ..... 7.00

SERVICE INSTRUMENTS

VACUUM TUBE ANALYZER—MODEL 686, TYPE 9

Dimensions { 19" x 26" x 7.3" / 483 x 660 x 186 mm } ...Approx. Weight { 105 lbs. / 47.6 kgs. }

Price on Application

The Model 686 Vacuum Tube Analyzer is used extensively in Industrial, Marine, Power and Light, Oil Refinery, and Railroad electronic control systems, as well as for laboratory, production, and shop testing of vacuum tubes.

An important feature of this analyzer is its comparative freedom from becoming obsolete, due to the introduction of new types of vacuum tubes. The Model 686 was the first commercial vacuum tube analyzer to have the tube socket panel separated from the control panel, connections being made by jumper cables, thereby assuring a minimum possibility of obsolescence.

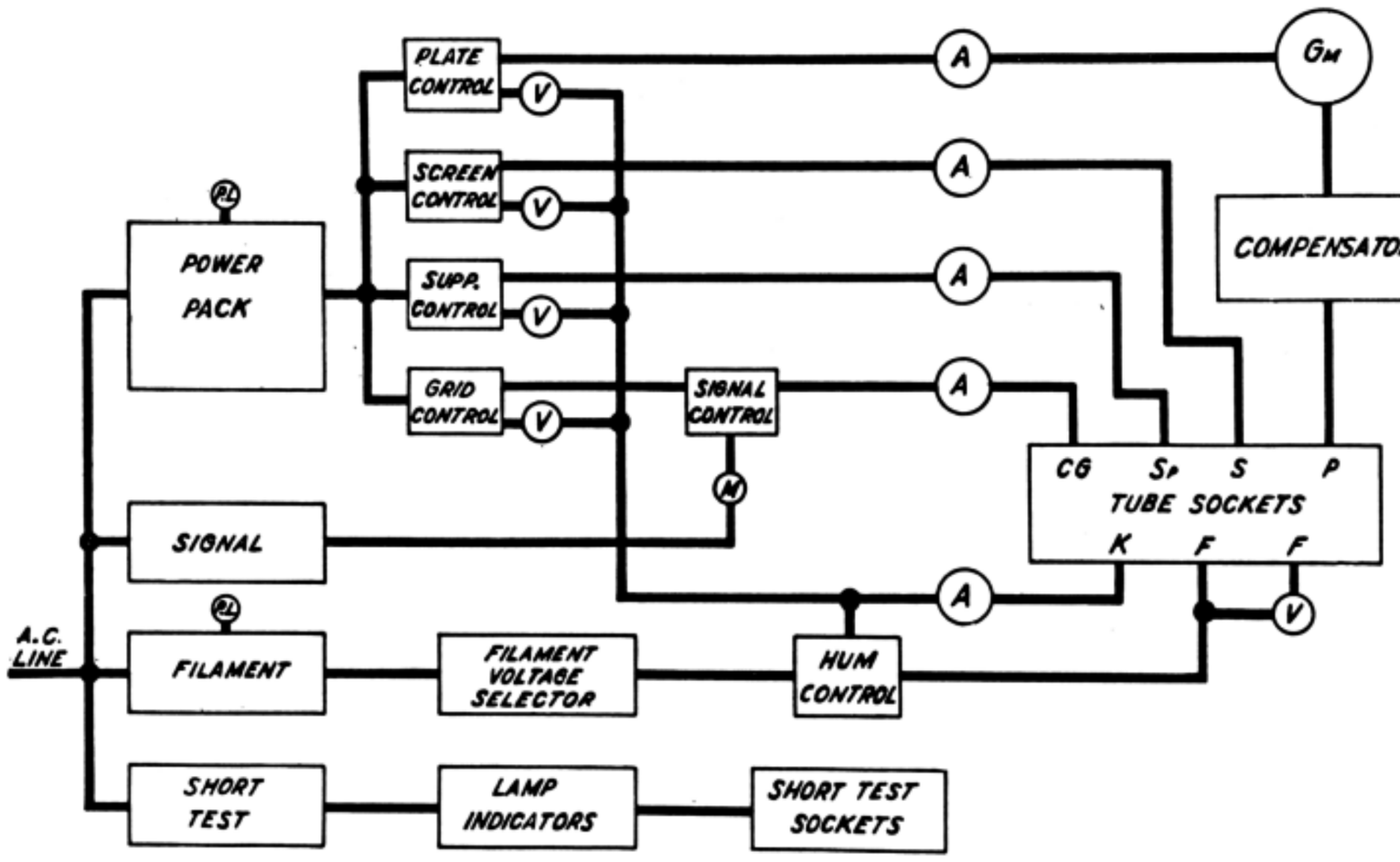
Of the many measurable characteristics of a vacuum tube, transconductance is the one most closely associated with operating performance. For this reason the factor which determines the useful life of vacuum tubes is generally taken to be the transconductance, except in the case of diodes, which have no grids, and except in cases of certain other tubes, the transconductance of which is not conveniently measured. The factor which determines the end of useful life of these last mentioned tubes is generally taken to be the cathode emission current measured under specific conditions. The Model 686 equipment measures transconductance by measuring the change in alternating current produced in the plate circuit by a 60 cycle signal applied to the grid of the tube under test.

In addition to the general transconductance and cathode emission tests previously mentioned, this equipment is designed to make: Static Characteristic Curves . . . Dynamic Characteristic Curve by Load Addition . . . Mutual Conductance Test at any point on Tube Characteristic Curve . . . Screen, Suppressor and Plate Current Check . . . Grid Current (Gas Test) . . . Short Check of all Elements, and Sectional test of composite tubes.

Well filtered, individually metered, continuously variable D-C potentials are supplied to all electrodes except the heaters.

Specifications—Model 686, Type 9

Filament Potentials	1.0 to 117 Volts AC
Plate Potentials	0 to 150, 0 to 300 Volts DC
Screen Potentials	0 to 150, 0 to 300 Volts DC
Suppressor, etc. Potentials	0 to 150, 0 to 300 Volts DC
Control Grid Potentials	0 to 10, 0 to 50 Volts DC
Plate Current	0 to 5/10/50/100 Ma. DC
Screen Current	0 to 5/10/50/100 Ma. DC
Suppressor Current	0 to 5/10/50/100 Ma. DC
Cathode Current	0 to 5/10/50/100 Ma. DC
Control Grid Current	15-0-15 and 1500-0-1500 Microamperes DC
Signal Voltage	0 to 1 Volt AC
Gm Range	0 to 3000/6000/15000 Micromhos



SCHEMATIC BLOCK DIAGRAM

VACUUM TUBE ANALYZER—MODEL 686, TYPE 8