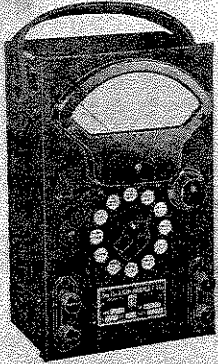


CLOUGH-BREngle 1937 Super-Service Line

MODEL 85-A UNIMETER



This low cost point-to-point set analyzer offers every facility for rapid and accurate receiver checking. The large D'Arsonval 4-in. fan-type meter has d-c voltage scales of 0-15-150-750 v. D-c current of 0-, .5-, 5-, 50 ma, a-c 0-15-150-750 v., and resistance from 1/2 ohm to 2 meg-ohms on three scales.

The 0-100 ohms scale is of the shunt type, greatly reducing battery drain and increasing accuracy on the important low ohm readings. When tests are made to the output post marked "Receiver," a heavy duty blocking condenser is in series to re-

move the d-c component of the plate circuit.

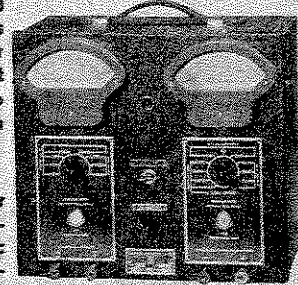
With the MODEL 85-A, all ranges are instantly available through the use of a rotary selector switch. The socket cable and adapters of former analyzers have been eliminated as an aid to quick servicing and to prevent needless obsolescence.

MODEL 85-A Unimeter, net cash.....\$28.90
Complete with test leads and battery.

(Only \$4.00 down and seven monthly payments of \$4.10.)

MODEL 95 SUPER-UNIMETER

A new analyzer with added ranges to meet the requirements for quick checking of all receiver circuits and components. The first popularly priced instrument to offer direct reading of capacity in all needed values.



Two 4-inch fan-type meters offer d-c voltage ranges of 0-5-50-500-1000, d-c ma 0-5-50-500, a-c volts 0-8-40-160-400-800, five resistance ranges from 1/2 ohm to 20 megs. and capacity from .00025 to 16 mfd; all readings made from self-contained power supply eliminating battery inaccuracies and expense. Rotary switches provide instant selection of all ranges without complicated pin-jack or push button combinations. For 110-120 v., 60 cycle ac.

MODEL 95 Super-Unimeter, net cash.....\$58.75
Complete with test leads and rectifier tube.

(Only \$6.50 down and ten monthly payments of \$5.96.)

MODEL 95-R, Rack Style, net cash, \$60.75

COMPLETE SERVICE LABORATORIES

These Impressive Display Panels Build Customer Confidence

Here is equipment for the "Service Station of Tomorrow"! Picture the prestige-building and business-getting ability of these flashing green cabinets with silvered Lumaline floodlights pouring light over the black and silver front panels.

A Complete Service Laboratory can be assembled from any of the rack style C-B instruments described on the previous pages or is available in any of the specially priced combinations listed on the right. All unused panel space is filled with removable panels that may be replaced with other C-B instruments when you are in need of additional equipment, thus eliminating obsolescence.

Under the liberal terms of the C-B "Pay-As-You-Earn" Plan, a Complete Service Laboratory can be put in your shop for less than it was formerly necessary to pay for a single instrument—and it will start to build your earnings immediately.

Ask your jobber or write today for complete descriptive bulletin.

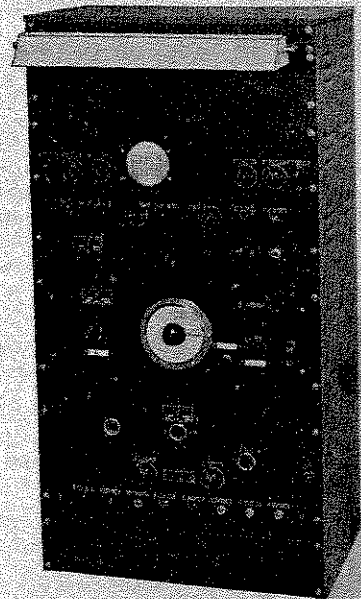
SERIES 1040—Complete with MODEL

OC-AR Signal Generator, MODEL 95-R Super-Unimeter and merchandising kit. Space for two additional instruments, net cash.....\$109.50
(Only \$13.00 down and 12 monthly payments of \$9.10)

SERIES 1020—Complete with MODEL OM-AR Frequency Modulated Oscillator and MODEL CRA-R Cathode-Ray Oscilloscope in laboratory cabinet. Beat-Note Audio Oscillator and Super-Unimeter Panels may be added later. Net cash.....\$195.50
(Only \$23.00 down and 12 monthly payments of \$16.40)

SERIES 1010—Same as the above Laboratory with the addition of the MODEL 79-BR Audio Oscillator. MODEL 95-R Super-Unimeter may be added for set analysis and component testing measurements. Net cash.....\$249.50
(Only \$28.00 down and 12 monthly payments of \$21.06)

SERIES 1000—The finest and most complete service equipment that modern engineering can offer. Complete with MODEL OM-AR Frequency Modulated Oscillator, MODEL CRA-R Cathode-Ray Oscilloscope, MODEL 79-BR Beat-Note Audio Oscillator, and MODEL 95-R Super-Unimeter, net cash.....\$299.50
(Only \$33.70 down and 12 monthly payments of \$25.26)



Sold by

Manufactured by

The CLOUGH-BREngle CO.

2815 W. 19th St., Chicago, U.S.A.

Cable Address—CEBECO, Chicago

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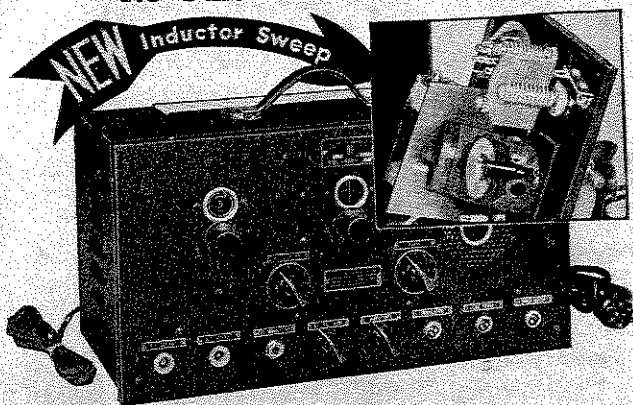
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CLOUGH-BREngle 1937 Super-Service Line

MODEL OM-A "CALIBRATED SWEEP" FREQUENCY MODULATED OSCILLATOR

No Other Instrument Has Ever Offered This Combination of Vital Features:



Many Thousand Servicemen In Over Thirty-two Countries Today Are Using This Famous Instrument

The introduction of this instrument marked an important milestone in radio equipment development. Many are the instruments that have been introduced as a result of its widespread success—yet none has duplicated its complete array of performance features.

Single and Double Trace Selectivity Curves: An exclusive feature of this instrument and the MODEL 81-A Frequency Modulator. Both curve types are needed for servicing of all receiver designs. Instant changeover, by means of a single switch, from single to double trace.

Selectivity Curve Calibrated in Kilocycles: A constant sweep width or "wobble" of plus and minus 20 kc is developed by the "Inductor-Sweep" (may also be used as a constant frequency oscillator with output meter when desired) at every test frequency from 100 kc to 30 mc, thus allowing the selectivity curve, either i.f. or overall, to be accurately calibrated.

Frequency Range and Accuracy: The MODEL OM-A covers from 100 kc to 30 mc on fundamental frequency output and is guaranteed accurate within 1/2 of 1 per cent at every frequency. Each instrument is individually calibrated on every band against a primary frequency standard which is itself checked daily against U. S. Government frequency signals. No other frequency modulated oscillator, regardless of price, offers equal frequency range or frequency accuracy guarantee.

Single and Double Trace Curves.

Calibrated Selectivity Curve.

Continuously Variable 100 kc to 30 mc on Fundamentals.

Accuracy Guaranteed to 1/2 of 1%.

Total Dial Length of 150 Inches.

Every one has a definite need in modern Cathode-ray Servicing—only with this combination can you assure lasting value for your instrument investment.

Dial Length 25 Inches Per Band: Each of the six separate coils of the Roto-Inductor unit is tuned over 25 inches of dial length enabling the MODEL OM-A to be set to a frequency accuracy of 1-10 of 1 per cent, thus making consistent guaranteed accuracy of 1/2 of 1 per cent. The claims of 1/2 of 1 per cent accuracy for instruments having six and seven inch dial lengths per band cannot be substantiated even when assisted by correction charts, due to the inaccuracy of setting such cramped dials.

Use With Any Oscillograph: The MODEL OM-A is designed for direct plug-in connection to the MODELS CRA and 105 Oscillographs, and may also be used conveniently with any other standard oscillograph.

Line Operated: From any 110-volt, 60-cycle source. Special 220-volt or 25-cycle models available on order.

MODEL OM-A Frequency Modulated R-F Signal Generator, complete with hand-drawn calibration curves, five metal tubes, output cable and calibrated selectivity curve screen, net cash \$64.50

(Only \$7.00 down and ten monthly payments of \$6.56)

MODEL OM-AR, same as above to mount in 19-inch rack, net cash \$74.50.

MODEL 81-A FREQUENCY MODULATOR—brings fixed-width frequency modulation to any r-f oscillator, modernizing it without alteration or destruction of calibration, for single and double trace selectivity curve production. Operation from 110-volt, 60-cycle lines, net cash \$34.25

(Only \$4.00 down and ten monthly payments of \$3.46)

MODEL CRA CATHODE-RAY OSCILLOGRAPH



This instrument offers complete facilities for countless problems of receiver circuit study and adjustment. R-f and i-f alignment, resistor, condenser, and vibrator tests are made while the receiver is under actual operation.

FLEXIBLE OPERATION: The switching system makes possible instant changeover for any desired test, greatly adding to the ease and simplicity of operation

HIGHER INPUT SENSITIVITY: Two improved input amplifiers, one for each set of plates, offer the highest sensitivity available on a Cathode-ray oscillograph, .38 rms volts per inch of deflection. This extreme sensitivity is an added advantage in servicing receivers of the latest designs.

WIDE-RANGE SWEEP: The MODEL CRA has an improved sweep

circuit with positive synchronizing control, generating fundamental sweep frequencies up to 20,000 cycles per second, allowing convenient study of wave forms at 150,000 cycles per second or higher.

These and many other features make the MODEL CRA the outstanding Cathode-ray oscillograph value, regardless of price. It has back of it the unequalled experience of the pioneer builder of Cathode-ray equipment for high-frequency applications.

MODEL CRA—Cathode-Ray Oscillograph, complete in metal carrying case with all tubes including the type 906 Cathode-ray tube, net cash \$92.50

(Only \$10.00 down and ten monthly payments of \$9.40.)

MODEL CRA-R, Rack Style, net cash \$99.75



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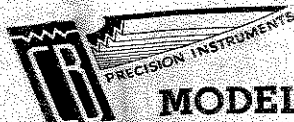
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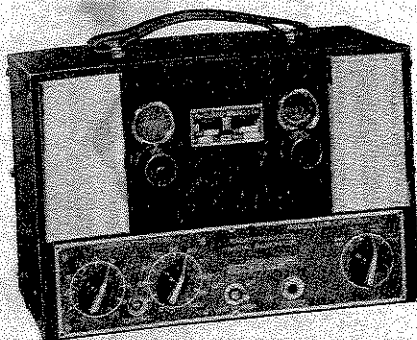
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Clough-Brengle 1937 Super-Service Line

MODEL OC-A PRECISION R-F SIGNAL GENERATOR



Battery-Operated Model

MODEL OD-A Battery-Operated Precision R-F Signal Generator, identical to the instrument described on the right, but operated from self-contained battery supply. Uses two Burgess type Z30P for plate and C-bias, and one Burgess type 4F2H for filaments, thus assuring ample voltage output and long battery life.

MODEL OD-A R-F Signal Generator, complete with calibration curves, output cable and all tubes, less batteries, net cash \$32.50

(Only \$5.00 down and seven monthly payments of \$4.50)

Guaranteed Frequency Accuracy $\frac{1}{2}$ of 1% Over Entire Range.

Fundamental Output Continuously Variable from 100 kc to 30 mc.

Hand-Calibrated Frequency Accuracy: Each MODEL OC-A is calibrated against C-B frequency standard at 10 or more points on each tuning band. There are no trimmers or other adjustments to make this calibration track with a pre-printed dial that may shift in service.

Instead calibration curves are drawn for each band and readings for over ninety-nine commonly used test frequencies are hand lettered into a ready-reference chart which may be seen on the front of the instrument.

25-Inch Tuning Dial Scale: This micro-vernier scale can be set to an accuracy of 1-10 of 1 per cent, thus allowing a frequency guarantee of within $\frac{1}{2}$ of 1 per cent, which is impossible to substitute with the usual 6 or 8-inch dial scale.

Roto-Inductor Unit: Eliminates the losses and calibration destroying effects of band-switches with their multiplicity of leads. Instead each coil is 100 per cent shielded by metal and

25 Inches of Dial Scale Per Band.
Band-Switch Losses Eliminated.
Dual-Range Stepless Attenuator for R-F and A-F Outputs.
Hand-Drawn Calibration Curves for Each Tuning Band.

rotated into the circuit, using less than four inches of lead for the entire coil circuit connections.

Output: The MODEL OC-A provides 400-cycle modulated r.f., unmodulated r.f., and 400-cycle sine wave audio outputs. Control is by a front panel switch.

Tubes and Circuit: Employs new temperature and voltage compensated circuit of improved frequency stability, with separate r-f and a-f oscillator-modulator tubes, and rectifier with triple line filter.

Power Supply: MODEL OC-A for use on 110-volt, 60-cycle line. MODEL OC-B for use on 110-volt ac-dc lines.

MODEL OC-A or OC-B R-F Signal Generator with hand-drawn calibration curves, shielded output cable and laboratory tested tubes, net cash. . . . \$34.50
 (Only \$5.00 down and seven monthly payments of \$4.83).

MODEL OC-AR, same as above to mount in 19-inch rack, net. . . . \$37.50

MODEL 79-B BEAT-NOTE AUDIO OSCILLATOR

A newly improved instrument offering a standard of performance not available in combination r-f and a-f oscillators. For radio receiver servicing, it has the advantage that it may be used to audio-modulate an r-f signal generator over the entire audible frequency range; especially for the extremely important frequency-characteristic test of the radio receiver. This cannot be done with the fixed a-f oscillators built into the r-f signal generators.

Continuously variable from 0 to 15,000 cycles, with accurate calibration throughout. Output is 27 volts at 5000 ohms or 150 milliwatts, several times the power

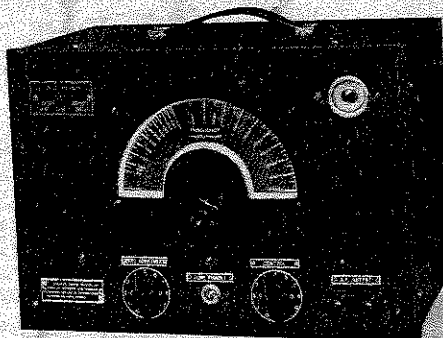
obtainable from oscillators using low power tubes.

Has built-in amplifier, type 6E5 electron-eye zero-beat indicator, and new air dielectric trimmer condensers. Distortion content less than 5%. Output essentially flat over entire frequency range. Operated directly from 110-volt, 50-60 cycle line.

MODEL 79-B Beat-Note Audio Oscillator, net cash. . . \$56.50

Complete in metal carrying case with all tubes. (Only \$6.50 down and ten monthly payments of \$5.70.)

MODEL 79-BR, Rack Style, net cash \$59.50



MODEL 88 COMBINATION VACUUM-TUBE AND PEAK VOLTMETER

A vacuum-tube voltmeter of improved practicability and ease of operation combined with a peak voltmeter of the "slide-back" type operating from an internal balancing voltage.

Long recognized as an indispensable laboratory instrument, the vacuum-tube has now become a frequent service instrument for measuring C-bias, avc, r-f voltage, etc., where ordinary voltmeters of even the highest sensitivity will draw current and upset circuit conditions.

As a vacuum-tube voltmeter, the 4-inch fan-type meter indicates 1.2 volts

for full deflection. Connection is direct to the tube grid giving an input resistance of 10 megs., sufficient to preclude drawing current in any circuit. As a peak voltmeter, ranges of 0-10 and 0-100 volts are offered. The entire unit is housed in a metal carrying case, with the voltmeter tube on a 30-inch extension cable to allow direct connection to circuit under test.

MODEL 88 Vacuum-Tube Voltmeter, net cash. . . . \$45.50

Complete with all tubes. (Only \$5.50 down and ten monthly payments of \$4.57.)



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NEW — A Low Cost Oscillograph

complete with

- ✓ LINEAR SWEEP CIRCUIT
- ✓ DUAL AMPLIFIERS
- ✓ SYNCHRONIZING CIRCUIT
- ✓ BEAM CENTERING CONTROL
- ✓ FIVE TUBES

An exact electrical duplicate, feature for feature, of the MODEL CRA Cathode-Ray Oscillograph, employing the new Type 913 Cathode-ray tube.

Experience gained in building thousands of larger oscillographs has shown that Linear Sweep Circuit—Dual Amplifiers—Automatic Synchronizing Circuit—and Beam Centering Controls are fundamental application features! Not one may be omitted without so limiting the utility of the oscillograph that any cost saving thus secured is wasted by limited performance.

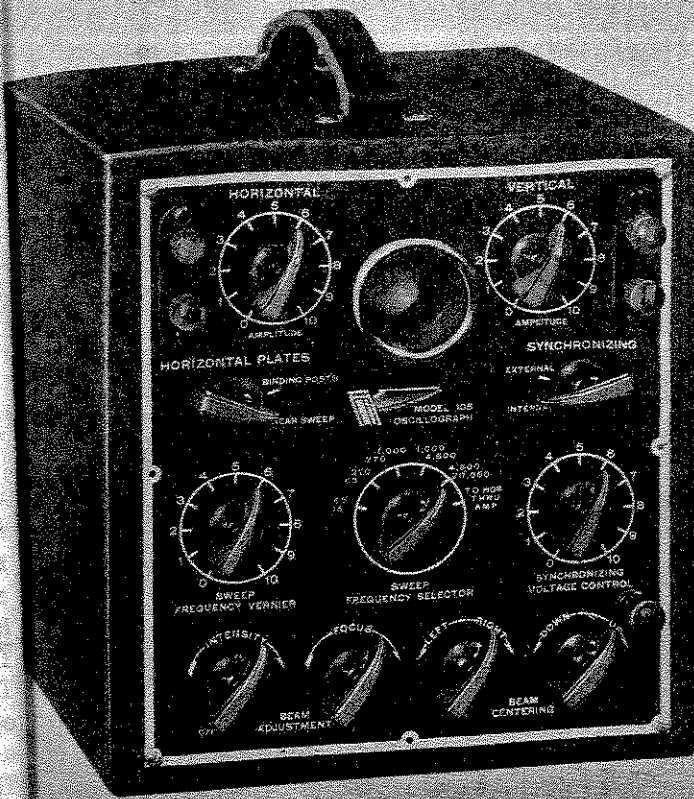
In building an oscillograph around the new one-inch tube, C-B engineers have allowed no compromise, but have endowed the MODEL 105 with every feature necessary for application to general laboratory work in addition to those needed for the more specialized fields such as audio amplifier, radio transmitter, and receiver servicing.

SPECIFICATIONS: Input sensitivity, .68 rms volts for full screen deflection; amplified and compensated linear sweep, range from 15 to 30,000 cycles per second with automatic synchronism for positive lock-in of image; all controls on front panel; complete selection of circuits by switches; black baked crystalac finished metal case measures 8 $\frac{1}{8}$ " high by 8 $\frac{1}{4}$ " wide by 9 $\frac{3}{8}$ " deep; etched silver and green front panel; weight, packed, 28 lbs.

Standard model operates directly from 110-volt, 60-cycle supply. Models available for other voltages and frequencies on special order.

MODEL 105 Cathode-Ray Oscillograph, complete with all tubes (five), net cash..... \$48.90

(Only \$5.50 down and 10 monthly payments of \$5.05)



MODEL 105 — net \$48.90 — only \$5.50 down

Receiver Servicing—This instrument is designed for combination with the C-B MODEL OM-A Frequency Modulated Oscillator or the MODEL 81-A Frequency Modulator to afford complete facilities for the countless oscillograph applications recommended in modern receiver servicing procedure. Panel matches those of the above instruments which are described in detail on the following pages.

Amplifier and Transmitter Analysis—The combination of lower cost and improved portability, made possible by the MODEL 105, greatly adds to the attractiveness of Cathode-ray equipment for the study of these problems. Careful design has made the MODEL 105 suitable for modulation checking at wave lengths as short as 5 meters. When employed with the MODEL 79 Beat-Note Audio Oscillator, every amplifier and transmitter problem of frequency response, distortion, modulation, etc., can be accurately and quickly investigated.

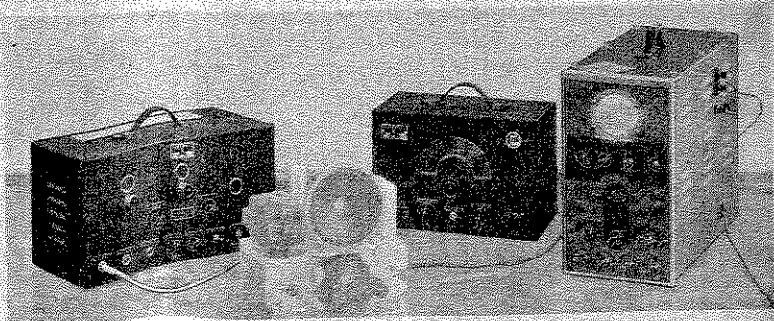
BUY C-B INSTRUMENTS ON THE CONVENIENT "PAY-AS-YOU-EARN" PLAN

Small down payment—balance in seven, ten, or twelve months

You are losing money every day that you are without modern service equipment. Today's complex receivers demand Cathode-ray Equipment for alignment, AVC checking, AFC adjustment, and distortion analysis.

Stop these losses with C-B equipment! The savings will cover the monthly payments and leave you money ahead.

See Your Distributor or Write Today for Purchase Application



Combine the MODEL 105 or MODEL CRA Cathode-Ray Oscillograph with the MODEL OM-A Frequency Modulated Signal Generator and MODEL 79-A Beat-Note Audio Oscillator—and you have complete facilities for receiver analysis not equalled by any other combination of instruments, regardless of price.

The CLOUGH-BREngle CO.