The ORIGINAL Complete Line of Exact Duplicate Replacement Vibrators

Type 3320
Type 3319
Type 3315

Philco Replacement  Chevrolet Replacement  RCA Replacement

And the Only Complete Line Licensed Under the Following U. S. Patents: 1924082 — 1935568 — 1935569 — 1944487
1946563 — 1951614 — 1961058

By the end of this year there will be more than 1,500,000 automobile radio sets in use using vibrators. More than half of these have already been in service for over a year. Everyone of them means an eventual vibrator replacement. Only with Radiart can you cash in on this business to the fullest extent. Only Radiart makes a COMPLETE line of exact duplicate replacement vibrators for these receivers. Radiart vibrators are known throughout the United States, Canada, and several nations of Europe. They have achieved an enviable record of excellent performance in the field under all sorts of operating conditions. More than 67% of the major manufacturers of automobile radios are today using Radiart vibrators as standard equipment. Follow the judgment of the engineers who originally designed the sets you are servicing and you will be sure of a satisfied customer and a constantly increasing repeat business.

Available at Most Good Jobbers — Write for Catalog

The Radiart Corporation
East 133rd at Shaw Avenue  Cleveland, Ohio

C. R. STRASSNER, Representative
1341 South Hope St.
Merchandising Radio Service

THE NATIONAL UNION RADIO CORPORATION is helping thousands of Radio Service Dealers throughout the country to better their business by sending their dealers valuable information on how to properly merchandise their services. This is a very important part of your business and of any business.

NATIONAL UNION RADIO TUBES are made to the highest standard of quality, and they are backed up by this written guarantee to your customer:

Radio Dealers displaying the National Union “SIGN OF EFFICIENCY” emblem are safe in selling their customers tubes under this guarantee. These dealers are receiving constant sales helps that are real factors in bringing in additional Service business.

NATIONAL UNION has a very comprehensive program outlined for this year that is aimed directly at YOU! It carries this message:

We want you to let us help

1. INCREASE YOUR BUSINESS.
2. INCREASE YOUR PROFITS.
3. INCREASE YOUR SATISFIED CUSTOMERS.

You'll be interested in this sales building program. Phone or write us now for the details.

Kierulf & Company

1133 VENICE BOULEVARD
Fitzroy 5111
Los Angeles

March, 1935
The "TECHNICIAN"

Speaker Repairing

We are equipped to render REAL SERVICE on your speaker problems. Complete stock of replacement parts for any make, and for those “Hard to Get” auditorium type replacements we offer the best service on the coast.

Hawley Speaker Cones

The original moulded cones recognized for their excellent frequency characteristics are featured and available for any speaker. Cones replaced—Field coils rewound—Voice coils repaired and rewound.

All Work Guaranteed

Vern’s Speaker Repairing
1827 W. 65th Place
Phone TW-5416
Los Angeles, Calif.

We Carry At All Times
Most Complete and Biggest Assortment of
RADIO PARTS
— In The West —
All The Nationally Known Makes of
REPLACEMENT PARTS
TEST EQUIPMENT
PUBLIC ADDRESS SYSTEMS
RECEIVERS AND TRANSMITTERS
WHOLESALE TO DEALERS AND SERVICEMEN ONLY

Radio Supply Co.
912 So. Broadway
Phones VAndike 3178 - 3179 3170
Los Angeles, Calif.
Portable Tube Tester

MODEL 427

PORTABLE TUBE TESTER
WITH VOLT-OHMOMETER RANGES

Direct reading — tests every type of tube. Not an ordinary emission tester. Detects bad tubes on the basis of amplification ability. Neon shorts test with sensitivity up to 500,000 ohms leakage detection. All shorts test made with tube heated. Has meter range for DC volts—milliamperes and ohms.

Specifications on Test Meter Ranges

Ohms Range—Dial Calibrated
Direct... No chart required. Reads 0-9,000 ohms 0-300,000 ohms. Readings as low as 10 ohms easily made. Compensator provided to correct for battery voltage.

D.C. Volts Ranges... Scales of 0-10, 0-100, 0-300 volts D.C. (200 ohms per volt).

D.C. Milliamperes... Scales of 0-10, 0-100, 0-300 D.C. M.A.

Case in hand finished quartered oak.
Dimensions approx. 11 In. x 10 In. x 5 In.

$29.50 (Net to Dealers and Servicemen)
(Slightly higher west of Rocky Mts.)

There Are Other Jackson Test Instruments Designed to Give Positive, Accurate Results in Radio Servicing. Write for Latest Bulletin or See Your Distributor

The Jackson Electrical Instrument Co.
DAYTON, OHIO

California Representative
B. M. FUHRMAN, 1121 S. Lucerne Blvd., Los Angeles
LEO J. MEYBERG CO., Distributor, 335 W. Washington—PR. 9255
Recommended and Sold by Leading Distributors Everywhere

ELECTRICAL INSTRUMENTS

Dimensions approx. 11 In. x 10 In. X 5 in.

LEO J. IVIEYBERG CO., Distributor, 335 W. Washington—PR. 9255

Other Jackson

DAYTON, OHIO
ELECTRICAL INSTRUMENTS

WILLIAM J. DAYTON, President

The "TECHNICIAN"
March, 1935


A. PAUL, Jr. President
JOHN L. VINCENT, Vice-President
V. KARL HATFIELD, Secretary-Treasurer

1656 N. Serrano Street
Los Angeles, California

$1.50 Per Year
15 Cents Per Copy

Vol. II
March, 1935
No. 7

EDITORIAL
By The Editor

"What Class of Customer"

Whenever a group of service technicians or radio dealers get together the conversation, besides technical discussion, usually includes much of personal experiences with chiselling customers.

This brings us to a question which undoubtedly should receive some deep consideration. What type of customer should we cultivate?, what type of customer is the most valuable?, what type of customer is the backbone of the radio business? It is certainly not only unwise but foolish to allow personal tastes to influence your attitude or treatment of a customer. Regardless of whether John Jones likes Hillbilly music, crooners, jazz orchestras, religious fanatics, opera, symphony, political speeches, etc. every one of his dollars contains one hundred cents and providing he is not too big a chiseller, his business should be cultivated.

However, let us consider briefly the experiment made by Radio Station KECA during the last year. This station has confined its programs almost entirely to classical music, cultural lectures, operas and news. Glen Dolberg, program director of KECA—KFI, informs us that in a two-weeks' period, during which KECA has asked its listeners the direct question, "Shall KECA continue its fine music programs or shall it revert to the broadcasting of popular music, jazz and crooners?" 10,483 music lovers voted in favor of good music by cards, letters and telegrams to this station.

The purpose of this discussion is to point out that the development of these listeners as customers is very worthwhile business, inasmuch as musicians, lovers of symphony, classical music and opera are not satisfied with ordinary radio reception. For the most part they desire to purchase and properly maintain high-class radio receiving equipment capable of faith fully reproducing symphony music.

A large percentage of those listeners who demand and appreciate classical programs are not equipped with radio receiving equipment capable of reproducing the wide frequency range and excellent quality of KECA broadcasts.

Lending some serious thought to this problem and planning an intelligent and well prepared sales campaign whereby you can convince this class of listener that your service will put his receiving equipment in condition to more faithfully reproduce the type of music he loves and enjoys will undoubtably pay excellent returns. Also, there is a vast field for the sale of high fidelity receivers to this class of listener by carefully pointing out and demonstrating the excellent programs of the type which he enjoys which are available over KECA.

Mr. Dolberg ventures the opinion that only about 2 per cent of all radio listeners possess receiving equipment capable of reproducing faithfully the excellent quality and frequency range of KECA.

Therefore, in summary, be urged to concentrate upon this class of listener in offering high-class service and sales of high fidelity receivers.
DIRECTORY OF RADIO PARTS EQUIPMENT AND ACCESSORIES AND FACTORY AGENTS

At the request of many readers of the "Technician" in all branches of the radio industry in Southern California we have prepared an alphabetical directory of the leading lines of radio replacement parts, test equipment and accessories. This directory will list items by the brand name or manufacturer's name and following the item will be the name of the factory agent in California. A supplementary directory will alphabetically list all manufacturer's agents, their phone numbers and addresses.

It is perhaps very much in order to discuss in brief the purposes of this directory, just what part factory agents play in local merchandising and how readers may use this directory to greatest advantage. Users of all types of electronic equipment very frequently are in need of technical information, which for various reasons may be difficult to obtain from printed matter at hand or from jobbers who handle several dozen lines. The factory agents may then be contacted to furnish or secure such information as may be desired.

Factory agents supervise the merchandising of their lines in their territories and arrange contacts between factories and wholesale firms. Factory agents do not sell directly to consumers except, of course, in the case of manufacturing plants using the component parts. This explanation is emphasized in order that readers will not expect to deal directly with the factory agent, but will only contact him for pertinent information, engineering specifications and other data as may be desired.

It is realized, of course, that this directory is not entirely complete. We have used every effort to obtain all the information possible and any additions to this list will be greatly welcomed by the editorial staff of the "Technician" and will be published in subsequent issues as supplements to this directory.

Where more than one agent is listed the first will be in Southern California and the following in Northern California. As so, we should be most happy to receive the opinions of readers on compiling and publishing directories under other classifications.

Aerovox Corporation
Advance
Alden Products Company
American Transformer Company
American Steel Package Company
Amperex Electronics Products, Inc.
Amperite Corporation
Arcturus Radio Tubes
Ariston Laboratory
Astastic Microphone Laboratory, Inc.
Best Manufacturing Company
Bliley Electric Company
Bud Radio, Inc.
Burgess Battery Company
C.
C. R. Cannon Company
Capitol Mfg. Company
Capitol Radio Engineering Institute
Capitol Radio Research Laboratories
Chicago Telephone Supply Company
Clarostat Manufacturing Company
Clough-Brengle Company
Crescent Insulated Wire & Cable Company
Crowe Nameplate Manufacturing Company
Cornell-Dubilier Corporation
Curtis Condenser Corporation
Corwico Wire

A
W. C. Hitt
C. F. Sexton
Marbank Sales Co.
C. R. Lynch
W. Bert Knight, Inc.
Conrad R. Strassner
Don C. Wallace
T. B. Pritchard
C. F. Sexton
Conrad R. Strassner
Don C. Wallace
Don C. Wallace
S. H. Cohn
Dick Huber
V. T. Rupp

B
J. T. Hill
Don C. Wallace
Norman B. Neely
Frank A. Emmet Co.
J. J. Perlmutth
J. J. Perlmutth
J. J. Perlmutth
W. Bert Knight, Inc.
W. Bert Knight, Inc.
W. Bert Knight, Inc.
W. Bert Knight, Inc.
W. Bert Knight, Inc.
W. Bert Knight, Inc.
J. J. Perlmutth
Marbank Sales Co.

C
J. J. PERLMUTH
225 E. Pico Street
Los Angeles, Calif.

DISTRIBUTORS

RADIO SPECIALTIES CO.
1816 WEST EIGHTH ST., LOS ANGELES
Federal 6633
ORIGINATORS OF PRACTICAL RADIO ENGINEERING INSTRUCTION

Pretty Good
...is not good enough!

To be better than the requirements of your particular work... is the most important step toward a real future in Radio. TECHNICAL TRAINING coupled with your own experience will equip you to take advantage of every opportunity to improve yourself, and to handle your present work in a more proficient and economical manner—after all, you are working against "Time," and CREI training will show you how to do more and make more during your working hours.

CREI TRAINING FOR EVERY SERVICE TECHNICIAN

There's a particular course for you, written in your "own language" and covering every phase of radio engineering. Talk it over with Mr. Guilford or write for complete information and easyayment plan.

Write for Free 44-Page Catalog

Capitol Radio Engineering Institute

14th and PARK ROAD, N. W. WASHINGTON, D. C.

Dept. T3

California Representative:

EDWARD H. GUILFORD

1656 North Serrano—GR. 0755

Mr. Guilford, member of CRTA, will be glad to be of assistance to you in answering inquiries and describing courses.

Directory of Radio Parts Equipment and Accessories and Factory Agents

(Continued from page 6)

Dejur Amoco Corporation.................................Frank A. Emmet Co.
J. F. Distributing Company...............................Don C. Wallace
Drake Mfg. Co............................................C. F. Sexton
Eby Specialty Company.................................W. Bert Knight, Inc.
Hugh H. Eby, Inc........................................C. F. Sexton
Eddie Mfg. Co..............................................E. P. Demarest
Electrad, Inc..............................................Lewis E. Sperry
Emerson Apparatus Company............................F
A. M. Flechtheim & Company...............Conrad R. Strauss
Federal Instruments Corp.............................Marshank Sales Co.
Federal Engineering Co...............................Harry Fox
Federated Solder Co..................................C. F. Sexton
General Cement Mfg. Co...............................Lewis E. Sperry
General Communication Laboratory...............C. R. Lynch
General Transformer Corporation..................W. C. Hitt
Girard-Continental Condenser Corp...............C. F. Sexton
Girard-Hopkins..........................................Paul F. Wiley
G. M. Laboratories....................................C. R. Lynch
Goat Radio Tube Parts, Inc...........................Frank A. Emmet Co.
Guardian Electric Mfg. Co..............................Lewis E. Sperry
Hammarlund Manufacturing Company............Henger-Seltzer Co.
Handy Scratch Remover...............................C. F. Sexton
Hawley Products Company.............................E. P. Demarest
Hawke & Sons Corporation..........................E. P. Demarest
August Hund Electrotherapy........................Norman B. Neely
Inca Transformers....................................Phelps Dodge Copper Products Corp.
I. R. C. Resistors.....................................Marshank Sales Co.
Jefferson Electric Company.........................Don C. Wallace
E. F. Johnson Company...............................Don C. Wallace
Jensen Spps..................................................Marshank Sales Co.
Ken Rad Corporation..................................W. Bert Knight, Inc.
Kennedy Nameplate Co................................C. F. Sexton
Kentucky Electric Lamp Company...............W. Bert Knight, Inc.
Kester Solder Company.................................Frank A. Emmet Co.
Kurz-Kasch Company..................................J. T. Hill
Kenyon Trans. Corp...................................Marshank Sales Co.
Liedner Electric Company............................Don C. Wallace
Lenz Electric Company...............................Frank A. Emmet Co.
Lifet ime Corporation.................................Don C. Wallace
Arthur H. Lynch, Inc.................................E. P. Demarest
Matchless Electric Company........................W. Bert Knight, Inc.
Meissner Manufacturing Company...............W. Bert Knight, Inc.
Micamold Radio Corporation.......................Frank A. Emmet Co.
Miller Coils..............................................J. W. Miller Company
Morrill and Morrill....................................Don C. Wallace
M P C Transformers....................................Mr. Hadley
National Company.....................................E. P. Demarest
National Union Tubes.........................J. B. Marsh

(Continued on page 21)
CHARLIE NICHOLS AND WEDDING BELLS!

Weddings to the right of us, weddings to the left of us! Members of the radio profession seem to have suddenly become very matrimonial conscious.

Our old friend and loyal CRFA member, Charlie Nichols, formerly an engineer with Jackson Bell and Wilson Bell, who besides many other experiences has done his trick as a professional radio operator on board ship and a well-known ham, is now service engineer for the Beacon Electric Company.

Charlie, sometimes referred to as "the man from the South with the big blue laugh," after fifteen months of very ardent wooing, as only these Southern sheiks are capable of, broke down all the defences and resistance of charming Myrtle Woraley.

The happy event took place at 4 o'clock Sunday, March 17, St. Patrick's Day, at the Trinity Methodist Church in Los Angeles. Immediately after the ceremony the couple left for a honeymoon trip to San Francisco and the Bay District. Los Angeles. Immediately after the ceremony the couple left for a honeymoon trip to San Francisco and the Bay District.

WEDDING BELLS!

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The Radio Specialties Company, well known and progressive radio parts jobber in Los Angeles, announces the establishment of a resident man in San Diego, covering the San Diego territory with a supply truck. In approximately sixty days this firm expects to have a first-class store in San Diego, covering a complete stock of radio tubes, component and replacement parts, test equipment, wire and accessories. Mr. R. V. Weatherford, connected with Radio Specialties for a considerable time, will be in charge of operations in the border city.

BOOK REVIEW

Air Law—Howard S. LeRoy—Ran-

dolph Leigh Publishing Company, 725 E.

15th Street, Washington, D. C. —$3.00.

This is an Outline and Guide to Air

Law, including Radio Aeronautics and Air

Rights as related to realty. Its pur-

pose has been to afford a concise and

comprehensive survey of available legal

material, showing a rapid world growth

in this field. It covers municipal, radio

law of the United States and foreign

states, municipally and aeronautics and

air rights as related to real estate. This

analytical and chronological guide out-

line will prove invaluable to the Bench

and the Bar as a whole, as well as to re-

search workers in radio and aeronautical

law. It is recommended to all those

whose work is concerned in any way with

legal aspects of aeronautics and radio.

NEW PACKARD-BELL POPULAR

The new 5-tube Packard-Bell recently

announced is surpassing in popularity

even the fondest hopes of its manufactur-

ers. It is a sensitive, modern and at-

tractive table set at a nominal price.

SUPREME AUTOMATIC

Electric Products Service, authorized

factory service for Supreme Instruments

Corporation, offers a brief description of

the new 385 "Automatic." In brief, it is

a single instrument retaining every fea-

ture of both the 333 Deluxe Analyzer

and 85 Portable Tube Tester plus many

additions. These include 2 ohmmeters

giving many ranges from 1/4 ohm to 20-

000,000 ohms with self-contained power

supply. Added to that is an English-

reading electrolytic condenser tester which

reads the value of any capacitor of any

size directly in terms of "Good" or "Bad". This is in addition to the direct reading capacity range and neon leakage test for non-electrolytics.

NEW TRIUMPH

The Triumph Manufacturing Company of Chicago announces an improved Signal Generator. This instrument electronically and mechanically is essentially the same as the Model 100 but is equipped with an additional dial, calibrated from 100 Kc. to 30 Megacycles. To facilitate routine testing the popular intermediate frequencies and common broadcast test frequencies are all spotted in red.

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SERVICE KINKS AND PET EQUIPMENT

EDITOR'S NOTE: Through the kind-

ess and courtesy of Mr. H. K. Bradford,

president of the Capitol Radio Research

Laboratories, we are able to publish the

following material taken from the usual

CASE RECORDS OF BROADCAST RE-

CEIVER REPAIRS.

PHILCO ALL SETS—WIRING COLOR

CODE

The standard wiring color code has

been adopted by Philco and it is the

R. M. A. standard. There are only a very few exceptions to this in Philco receivers.

Colors

Circuits

Filaments and odd wires

Red

Brown and white plates

Green

Cathodes and grounds

Brown and white wires

White

Black and white plates

Red

Filaments and odd wires

GREEN

Grids and screen grids.

BROWN

PHILCO 5—NOISY VOLUME WHEN TUNING

Tighten the main volume control nut in the chassis and be sure that it is well grounded.

STROMBERG CARLSON 38, 39, 40, 41

(2nd Type)—NOISY VOLUME

CONTROL

Gas in the 55 tubes is responsible. Inter-

change and replace if necessary.

ZEHN 34—LOW VOLUME

AND HUMS

A short in any of the type 27 from heater to cathode will cause hum. This trouble can most easily be checked by substituting new tubes known to be in good condition. Low volume may of-

ten be attributed to poor contact at the-

nial peripheral circuits of this type.

When this item will clear up this

trouble.

STEWART-WARNER 102-A—INTER-

MITTENT OPERATION,

DIAL SLIPS

For the first trouble check the toggle

switches. For the second remove the

rubber drive wheel and wind one layer of tape on its shaft to replace.

MAJESTIC 90—INTERMITTENT

RECEPTION

If this trouble is characterized by the

signal dying down suddenly or slowly and

returning suddenly replace both R. F.

cathode resistor by-pass condensers lo-

ated under the 27 tubes. These are 5

Mfd. units in metal cases.

GENERAL ELECTRIC 34—DEAD

Most cases of this kind may be cleared

up simply by replacing the 6A7 tube.
20,000 EARS DEMAND FINE MUSIC

GLEN DOLBERG, Program Director KECA—KFI

From March 3rd to 14th, inclusive, in response to KECA's direct question, "Shall KECA continue its fine music programs, or shall it return to the broadcast of popular music, jazz, and crooners?", ten thousand, four hundred eighty-three people, mostly within the limits of Los Angeles County, who are sufficiently interested in listening to fine music on radio to sit down and write KECA a letter. Multiply this number by ten, and you will, for an approximate number of interested people who intended to write a letter but did not do so, and you will have a conservative estimate of KECA's audience which demands the finer things in music. Good music deserves good radio receivers. KECA transmits good quality and a wide frequency range. How many listeners actually hear this full quality and range on their sets? My guess would be about two per-cent; and I believe that this condition affords unlimited opportunities as a market for new radio receivers. KECA transmits good quality and a wide frequency range. How many listeners actually hear this full quality and range on their sets? My guess would be about two per-cent; and I believe that this condition affords unlimited opportunities as a market for new radio receivers. KECA transmits good quality and a wide frequency range.

According to scientists long distance sound waves travel in the less resistant sound waves travel in the less resistant high sound waves gradually bend downward so that they travel in a vast bow-shaped curve.

You may be interested to know that KECA also enforces a rigid commercial policy in direct keeping with its program standards, and, as a result during the past year, KECA has refused many thousands of dollars worth of business because the type of product and type of advertising requested did not measure up to KECA's standards.

It seems to me that everyone of you can profitably afford to spread the news of KECA's success as a classic station. "By all means KECA must continue its fine music programs. Give us more symphonies, operas, and good music of all kinds, and keep KECA free from jazz. Over 30% said that if it were not for KECA, they wouldn't own a radio set. Here are ten thousand, four hundred eighty-three people, mostly within the limits of Los Angeles County, who are sufficiently interested in listening to fine music on radio to sit down and write KECA a letter. Multiply this number by ten, and you will, for an approximate number of interested people who intended to write a letter but did not do so, and you will have a conservative estimate of KECA's audience which demands the finer things in music. Good music deserves good radio receivers. KECA transmits good quality and a wide frequency range. How many listeners actually hear this full quality and range on their sets? My guess would be about two per-cent; and I believe that this condition affords unlimited opportunities as a market for new radio receivers. KECA transmits good quality and a wide frequency range. How many listeners actually hear this full quality and range on their sets? My guess would be about two per-cent; and I believe that this condition affords unlimited opportunities as a market for new radio receivers. KECA transmits good quality and a wide frequency range. How many listeners actually hear this full quality and range on their sets? My guess would be about two per-cent; and I believe that this condition affords unlimited opportunities as a market for new radio receivers. KECA transmits good quality and a wide frequency range.

A separate English reading meter scale is used for the improved "Quality" tests of all radio tubes. The new tube testing circuit includes the neon leakage tester directly classifying condensers on the meter dial as "Good" or "Bad." Resistance ranges offer a complete coverage from the low range 0-200 ohms with the lowest division at 1/2 ohm, plus the intermediate ranges 0-200-2000-20000 ohms and high megohm ranges of 0-10 and 0-20 mega. All resistance ranges from self-contained power.

The 385 AUTOMATIC

Presenting the Supreme "385 Automatic," marking another Supreme Trailblazing Achievement... "UNI-CONSTRUCTION." Go to your Jobber to see the "385 Automatic" and prepare yourself to expect not only a new standard of value made possible by uni-construction, but an instrument sure to revolutionize radio service procedure. Built on an entirely new principle the "385 Automatic" is a complete, easiest, and the fastest instrument ever built—AUTOMATIC in its diagnosis.

In addition to retaining the many popular features of the famous Deluxe Analyzers and 85 Tube Testers, the "385 Automatic" has PLUS features. In the analyzer, using the well known Free Reference Point System of Analysis, selector switches are used for connecting the meters as D.C. milliammeters 0-250-500-1250 milliamperes, D.C. or A.C. volts, 60 cycle, A.C. operation.

Immediate Delivery of "385 Automatic" and other Supreme Instruments from your local Jobbers.

Supreme Instrument Corp.
522 SUPREME BLDG.
GREENWOOD, MISS.
Export Dept. Associated Exporters Co., 1457 Broadway, New York City
Cable Address, LOPREH, New York
ELECTRICAL MEASURING INSTRUMENTS
By C. CLIFFORD ADAMS, Laboratory Superintendent
Quality Electric Company

(Continued from last month)

THERMO COUPLE TYPE

The development of the present form of Weston Fitting Elements is based on the principle that if a conducting strip of uniform cross-sectional area, which is carrying current, is cooled only by conduction through the body of the strip itself and not directly by the surrounding air, the difference in temperature between the center of the strip and the terminals will be proportional to the square of the current flowing, and inversely proportional to the length of time the combination is in circuit.

RECTIFIER TYPE INSTRUMENTS

The rectifier type A.C. instrument consists of a copper oxide rectifier connected to a D'Arsonval movement. The A.C. is rectified and then measured by the ordinary D'Arsonval movement. This type of instrument makes possible a greater sensitivity than is possible in other types of A.C. instruments.

The rectifiers are made of copper plates oxidized on one side, and copper strips under constant pressure. These rectifiers are usually assembled in such a way as to form a bridge circuit and give full wave rectification.

Rectifier type instruments have certain operating characteristics which make their application to A.C. measurements somewhat critical. These are as follows:

1. The torque and deflection of the rectifier type instruments are proportional to the first power of the current. Therefore it is not the average current that determines the effective value of the A.C. wave. The scale, however, calibrated to read effective or R.M.S. values of a pure sine wave. Errors on other than sine wave forms can be compensated for in readings, provided the wave form is known from which a correction factor can be applied, or the instruments may be calibrated on the wave form with which it is used.

2. The resistance of the rectifier type instrument is a function of the current flowing, decreasing with the increase of current flowing. Not only does the rectifier type instrument affect the circuit conditions on account of its added resistance like any other resistance, but the effect of the heating element lowers the safe overload capacity of 50 per cent. The full load drop is about 2,000 millivolts which is about 1/6 the drop on a hot wire expansion type instrument. Very little power is required for operation. The elements are used with indicating instruments of the D'Arsonval type. The combination of elements and elements is not affected by changes in room temperature or by the length of time the combination is in circuit.

(Continued on Page 27)
AEROVOX
for CONDENSERS

REFER to the new AEROVOX Catalog for your condenser requirements. It lists every type, size, capacity, for any or all your radio work. And your local AEROVOX jobber or supply house can make prompt delivery of any items you need, for AEROVOX distributors are the better, more substantial, truly service-minded firms that span the gap between factory stockroom and your work-bench.

PAPER CONDENSERS
Cartridge units, fibre case, bakelite case, stamped metal case, general purpose, uncased replacements, high-voltage filter, motor-generator condensers, etc., etc.

ELECTROLYTIC CONDENSERS
The largest line of stock units offered by any condenser manufacturer . . . all types of hermetically-sealed metal case units, cardboard case units, tubulars, “A” eliminator condensers, multi-section units, etc., etc.

OIL-FILLED CONDENSERS
For transmitting and other high-voltage applications . . . oil-impregnated, oil-filled, in round and rectangular cans . . . mass produced for lowest prices.

MICA CONDENSERS
Large line of molded bakelite units for receiving and transmitting circuits . . . also metal case units. Conservatively rated. Low-loss design.

EXACT DUPLICATE REPLACEMENTS
Critical study of sets in operation has resulted in the most complete line of exact duplicate replacements. All kinds electrolytics precisely matching original equipment in dimensions and characteristics, but with AEROVOX quality and performance. Also paper replacements and blocks.

AEROVOX
for RESISTORS

A companion line of components matching in quality, reputation and a fair price, the better-known AEROVOX condenser line. New catalog lists entire resistor line. And your jobber or supply house again carries a representative stock to meet urgent needs.

WIRE-WOUND RESISTORS
A superior grade of wire-wound vitreous enameled resistors . . . from small Pyrohm Jr. units no larger than carbon type but with wire-wound security, to large 200-watt adjustable units for transmitting and power circuits. All types, terminals, wattages, values. Also flat strip units.

NON-WIRE RESISTORS
To complete the entire line of essential radio components, AEROVOX also offers carbon resistors, grid leaks, mountings, lavite resistors, etc. No matter what your requirements, refer to our catalog, see our local supplier, save time, save money.

AEROVOX PRODUCTS come packaged in yellow-and-black cartons . . . with guarantee slip . . . for identification and protection.

PACIFIC COAST REPRESENTATIVES
W. C. HITT  R. R. BEAN
1341 So. Hope St.  2124 Smith Tower Bldg.
Los Angeles, Calif.  Seattle, Wash.

AEROVOX CORPORATION
83 WASHINGTON STREET, BROOKLYN, N. Y.
Sales Offices in All Principal Cities
National Radio and Electrical School

The largest Trade School in the West. Located in Los Angeles for over 30 years. Now offers complete, practical training in:

Radio—
Television—
Talking Pictures—
Broadcasting—
Commercial Operating—and
General Electricity

Modern, up-to-date equipment, all actually operating and available to the student to use in learning his trade. Expert instructors. At this institution, you receive friendly, sincere cooperation that makes success assured.

For the man already engaged in Radio work, who is ambitious to go ahead, National offers a particularly valuable opportunity through advanced training.

IN ADDITION, those who find that they need more Electrical knowledge than they have been able to acquire through previous Radio Training and experience will find a definite means to increased income through the outstanding, time-tested Electrical Training offered here.

Laboratories and Studios always open to inspection. We cordially invite you to visit the school at your convenience, without the slightest obligation. We shall be pleased to discuss your plans with you and to offer you every possible assistance toward the realization of your ambitions.

National Radio and Electrical School
4006 S. FIGUEROA STREET
LOSA ANGELES, CALIF.
TRAVELING THE TERRITORY WITH MILTON

Hello, all you boyos and girlies, here we are again wandering all over the territory, and we don’t mean maybe. The old Traveler, much lost in the twilight and sees lots of things, but they all fade into the dim dark beyond in the light of one particular event to which he was very much a witness. It came about in this way:

The Traveler in his usual rounds happened to drop in on Harry LeGoube, who to his charge of the instrumentalists in the auto radio department at Washburn-Walker’s. Noticing a certain tinge in Harry’s voice as well as a gleam in his eye, the Traveler mentioned same to Harry, who, after attending to the high price of bassfakata in Siberia for a few moments, finally admitted it was a girl.

“What’s the girl like?” queries the Traveler.

In reply comes forth the most ecstatic description of the “one and only” to which it has been one’s privilege ever to listen.

Well, then, why don’t you marry the girl?” we ask ever so coyly.

Well,” finally declares Harry, “just dreaming that Harry LeGoube is unto himself taking a wife.

After the hostilities have ceased and the time has been duly and thoroughly kissed, the Traveler dons his overcoat and leaves. Thusly:

To make a long story more palatable, the ushers, the beet man, and finally the groom take their places. The groom, all tingling with anticipation and excitement, turns his gaze hopefully toward the door through which the bride is to pass. First come the bridesmaids all decked dazzlingly in gowns of blue, pink, and gold—and then a pause.

“Where’s the bride?” everybody silently wonders while the groom nervously fidgets. A murmur escapes the congregation as the bride and groom make their way to the door. The groom is so nervous and tender that it causes a skip in the heart-beat of even a caddled old gander like the Traveler. All through the ceremony, the Traveler still has to pinch himself, just to make sure he isn’t only dreaming that Harry LeGoube is unto himself taking a wife.

See you all in the next session, playmates. So long!

NEW AUTO SETS

Electric Products Service advise that they are continuing distribution of “Delco” (United Motors) and Philco, auto radio. The new models have many new features and circuit improvements which will make both lines even better than last year’s models. Dealers and service men are invited to show I mean business, I’ll send you thusly:

O. K.," answers the Traveler.

"Seeing is believing, but not before I," shoots back the Traveler.

"Well," meekly is the answer. "I’ll be there.

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March, 1935

Directory of Radio Parts Equipment and Accessories and Factory Agents

(Continued from Page 9)

Oak Manufacturing Company

Ohio Carbon Company

Ohmite Mfg. Company

Oxford Speakers

Peak Products, Inc.

Peers Radio Cutters

Perflex Controls Company

Pioneer Gen-E-Motor Corporation

Polymet Mfg. Company

Raytheon Production Corporation

RCA Mfg. Company, Inc.

Radiotone Recording Co.

Reliance Condenser Co.

Shellcross Mfg. Company

Shure Bros. Company

Sound Systems, Inc.

Sprague Products Company (Sprague "600" Line)

Supreme Transformers

Supreme Instruments Corporation

Tartak Mfg. Co.

Taylor Tubes

Thermonic Laboratories

Thompson-Bremer & Company

Thordarson Electric Mfg. Company

Triad Radio Tubes

Triumph Radio Mfg. Company

Triumph Manufacturing Company

USL Battery Corporation

United Sound Engineering Company

United Transformer Corporation

Universal Microphone Company, Ltd.

Vestalite Corporation

Earl Webers Company

Westinghouse Electric & Mfg. Co.

Weston Electrical Instruments Corporation

Wireless Egert Engineering, Inc.

Wunderlich Radio, Ltd.

Yaxley Manufacturing Company

Y

(Continued on page 26)
NAT'L SCHOOL LECTURES
February 25, 1935, Mr. Hobart Drake, Instructor in charge of Radio Service, and Mr. Frederick Swift, Instructor in charge of Radio Transmitters, both of the National Radio & Electrical School, began a series of technical lectures of unusual interest to servicemen. These lectures are presented every other Monday evening at meetings of the CRTA in the Third Floor Auditorium of the National School, 4006 South Figueroa Street, Los Angeles.

Mr. Drake is discussing features of modern radio receivers, giving dependable detailed information to service technicians as to repair and adjustment procedure. Printed diagrams of the receiver under discussion are furnished those in attendance. These diagrams together with notes on the lecture will provide servicemen with dependable service information. Proceeding the lecture, Mr. Drake answers questions asked by members. Mr. Drake has promised to keep each questioner’s name a deep, dark secret and consequently many of the gang are taking advantage of this opportunity to clear up bothersome problems.

Mr. Swift has undertaken a series of detailed lectures of the theory, construction, operation and use of the radio technician’s and engineer’s new toy, the cathode ray oscilloscope. The explanation of the underlying theory is being done with the aid of some homely analogies, which, though they may seem far-fetched at first glance, drive home his points with unusual clearness. Mr. Swift has promised to include the necessary details of an oscilloscope of the cathode ray type, which can be built for a price not to exceed that of a good set analyzer.

This series of lectures is unusually educational and is very distinctive by reason of being entirely clear of unnecessary “hooey” and being completely filled with detailed, worthwhile, valuable and necessary information to service technicians who really have the desire, energy and underlying intelligence to progress.

NEW FACTORY
The Mission Bell Radio Mfg. Co., Inc., is now located in a spacious new factory at 833 Venice Blvd., approximately three blocks west of Figueroa. The new quarters provide for a complete and up-to-date auto radio installation department for the benefit of Mission Bell dealers. A complete line of new 1935 models of radio receivers is on display at the new address and all dealers are cordially invited to inspect the new factory and new merchandise.

We’ve Delivered the Goods
With the public constantly demanding more radio performance at less cost we have enabled the dealer to satisfy this urgent need.

• We produced a 5-tube super at the price of a 4-tube T.R.F.
• We produced an exceptional 6-tube skip-band super at the price of an ordinary 5-tube super.
• We produced an exceptional 5-tube skip-band super at the price of a 4-tube super.
• We produced an auto set that your customers have demanded for years at their price.

Packard-Bell Dealers Are Prospering—Why Not Handle What the Public Wants—“Packard Bell”
PERSONALS

John A. Orme, pioneer and active CRTA member, is now connected with the Technical Service Laboratories in Beverly Hills.

Reuben Horn has been appointed Chairman of the newly created welfare committee of the CRTA.

B. M. Fuhrman has recently received recognition from the RCA Manufacturing Company for having sold more RCA antenna kits than any one person in the United States.

Cash Swinney, who is still convalescing in Room 502 of Queen of the Angeles Hospital, is doing very nicely, although he will be confined to the hospital for some time to come. Visiting hours are from 2-5 and 7-9 P.M.

Murray Tweedy, well known by the trade, due to his many years' connection with the Parts Department of the Leo J. Meyberg Company, is convalescing at his home, having recently left the hospital after an operation for appendicitis.

NEW — 1935 ALL-WAVE SETS

"Western made for Western Reception"

NEW SPEAKER SERVICE

Vern's Speaker Repair, operated by Mr. Vernon Juergensen, announces new equipment and complete supplies to render voice coil, cone and field coil service for all loud speakers including auditorium types. Mr. Juergensen was shop foreman with the Lansing Manufacturing Company for eight years, during which time he was in charge of experimental and research work.

STARTLING EXPOSE

The April issue of the "Technician" will contain a startling expose of the vicious practices and deceitful methods employed by chain store merchandising concerns. This daring article laying bare the innermost secrets of the nefarious methods of chain store business will be written after extensive investigation by A. Paul, Jr., President of the Certified Radio Technicians Association and well known crusader in the radio industry of Southern California. Be sure to watch the April issue for this feature!

CURTIS SPECIALIZES

The Curtis Condenser Corporation specializes in the manufacture of electrolytic condensers of various shapes, sizes and voltages, cataloging approximately 250 different electrolytic condensers, not including the great variety of special condensers made for manufacturing purposes. Curtis manufactures condensers under its own patent No. 1950352. A little known fact is that Mr. J. T. Curtis was among the first in this country to start experimental work and research with electrolytic condensers and his present product is the result of years of laboratory work as well as actual experience in commercial manufacturing.

TEST EQUIPMENT HEADQUARTERS

ALL LATEST TYPES IN STOCK

Dependable Meter Service

ANY MAKE REPAIRED OR RECALIBRATED

SHUNTS AND RESISTORS MADE TO ORDER

TEST EQUIPMENT REBUILT AND MODERNIZED

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1358 South Grand Avenue Los Angeles, Calif. PROspect 3681

HAND-EE Grinder

quicker better jobs

Weighs 1 pound. Plug in any light socket and do 1001 jobs.

Do away with slow hand work. Grinds, ROUTS, drills, carves, sharpens, cuts, engravess.

For shop, home or tool kit. (Model A), A. C. or D. C. operation, 110v., 13,000 r. p.m. Order on 5-day trial. Satisfaction guaranteed.

NEW Master Craftsman's Set—17 useful accessories to grind, drill, polish, sand, cut, carve, engrave, etc. . . . Prepaid $5.00.

Chicago Wheel & Mfg. Co.
112 SOUTH ABERDEEN STREET
CHICAGO, ILL.


**Directory of Radio Parts Equipment and Accessories**

(Continued from Page 21)

**FACTORY AGENT DIRECTORY**

- **F. H. Brown** 735 Seward Street, Hollywood, Calif.—Granite 6972
- **S. S. Conners** 2523 S. Hill St., Los Angeles, Calif.—Prospect 3518
- **E. D. Marentet** 1127 Venice Blvd., Los Angeles, Calif.—FEDERAL 2115, 2116
- **Frank A. Emmet Co.** 1341 S. Hope St., Los Angeles, Calif.—Richmond 6301
- **Hengen-Seitzer Co.** 945 E. Pico St., Los Angeles, Calif.—Prospect 3108
- **Michel D.Henri** 180 New Montgomery St., San Francisco, Calif.
- **I. T. Hill** 821 W. Tenth St., Los Angeles, Calif.—VAndike 1932
- **W. C. H.** 1341 S. Hope St., Los Angeles, Calif.—Richmond 6301
- **Phelps Dodge Copper Prds. Co.** 2375 E. 27th St., Los Angeles, Calif.—Kilby 5166
- **Dick Huber** 30 Ninth Street, San Francisco, Calif.
- **A. E. Jackson** 1016 N. Sycamore Ave., Hollywood, Calif.—Hillside 4113
- **W. E. Knight, Inc.** 115 W. Venice Blvd, Los Angeles, Calif.—Prospect 3108
- **C. Lynch** 1114 S. Hill St., Los Angeles, Calif.—Prospect 3108
- **Charles M. Shiver** 1816 S. Flower St., Los Angeles, Calif.—Prospect 6957
- **J. H. Southard** 420 Market St., San Francisco, Calif.
- **Don A. Shaver** 115 S. Main St., Los Angeles, Calif.—Prospect 6957
- **Robert S. Smith** 1656 N. Serrano St., Los Angeles, Calif.—Granite 6972
- **R. J. Noel** 243 W. Adams Blvd., Los Angeles, Calif.—Prospect 3108
- **F. L. Pichel** 225 E. Pico St., Los Angeles, Calif.—Prospect 3108
- **T. B. Pritchard** 1214 Venice Blvd., Los Angeles, Calif.—PRospect 3515
- **Harry Fox** 115 S. Hill St., Los Angeles—PR 2830
- **J. W. Miller Co.** 7917 S. Main St., Los Angeles, Calif.—Adams 4297
- **Norman B. Neely** 355 E. Third St., San Pedro, Calif.—Prospect 6957
- **C. F. Sexton** 1224 Wall St., Los Angeles, Calif.—Prospect 6957
- **Glenn A. Shaver** 1227 S. Hope St., Los Angeles, Calif.—Prospect 6308
- **Charles Silvey** 1816 S. Flower St., Los Angeles, Calif.—Granite 6972
- **L. E. Sperry** 355 E. Third St., San Pedro, Calif.
- **Conrad R. Strasser** 1341 S. Hope St., Los Angeles, Calif.—Richmond 6301
- **Walter S. Sweet** 1426 Maple Ave., Los Angeles, Calif.—Prospect 6320
- **D. C. Wallace** 2414 Country Club Dr., Long Beach, Calif.—Rochester 8297
- **Paul F. Wiley** 4327 Wellington Road, Los Angeles—Rochester 8297

**NEW TEST FOR TUBES**

Electric Products Service, local distributor for Triumph test equipment, calls attention to a new type of test being used in the Triumph Model 400 Tube Tester. The tester applies three distinct tests to each tube. A hot short short test indicating leaksages as high as 3 to 5 megohms, a mutual conduction test, and a new test which actually shows the remaining emission ability (or life) of the filament for the cathode section of the tube. This clearly demonstrates to the customer on an English-prescribed dial how an old tube which has run its normal life and efficiency and a simultaneous study of all these variables is the only means by which temperature errors can be minimized.

**MICA XMTX CONDENSERS**

Departing from the conventional pointed-end design, Aerovox micra transmitting condensers permit stacking while at the same time offering any combination of electrical connections. These molded units have flat tops and bottoms, permitting perfect stacking in minimum space. Mounting holes are on one side of main body, thoroughly insulated and independent of condenser terminals. Thus each unit may be securely mounted anywhere, even on a metal chassis, without risk to the electrical connections. When stacked, the mounting screws or rods are slipped through aligned mounting holes, leaving terminal lugs free for any individual or group wiring. Terminals are of new design for soldered, permanent connections, without transferring harmful heat to the imbedded condenser section. Manufactured by the Aerovox Corporation of Brooklyn, N. Y., these mica transmitting condensers are available in wide range of capacities from .00005 to .04 mfd., and in 1000 and 5000 volt ratings.

**ELECTRICAL MEASURING INSTRUMENTS**

(Continued from page 14)

depends upon the actual current value passing. If the circuit resistance is relatively high, the change will be negligible. The instrument allows the effective electrical test of the type, when properly aligned, without transferring harmful heat to the terminal lugs free for any individual or group wiring. Terminals are of new design for soldered, permanent connections, without transferring harmful heat to the imbedded condenser section. Manufactured by the Aerovox Corporation of Brooklyn, N. Y., these mica transmitting condensers are available in wide range of capacities from .00005 to .04 mfd., and in 1000 and 5000 volt ratings.

**TUBE CHECKERS and SET ANALYZERS**

Repaired or Rebuilt

All types of instruments Repaired or Calibrated Shunts and Multimeters made up for any instrument PROMPT — ACCURATE RELIABLE SERVICE Authorized Service Laboratory for the Pacific Instrument Corp.

Quality Electric Co.

180 New Montgomery St., San Francisco, Calif.

March, 1935

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The "TECHNICIAN"
HATFIELD RESIGNS

Due to increasing demands of business upon his time, V. K. Hatfield, secretary of the CRTA, was forced to tender his resignation for that office. Fred Knowl- den, loyal and active member of the CRTA, was elected to fill the remainder of Mr. Hatfield’s term. It is with sincere regret that we report this resignation and we know that all members of the CRTA regretted the necessity of accepting it. However, Mr. Hatfield has worked diligently, conscientiously and extensively in behalf of the organization and his labors are most sincerely appreciated. The CRTA was fortunate indeed that Mr. Knowl- den accepted the post for the remainder of the term, inasmuch as he is most capable and has always shown his willingness to lend his support in any possible manner to the CRTA.

DUPLICATE REPLACEMENT CONDENSERS

Constantly adding to its regular stock of exact duplicate replacement condensers for the more popular makes of sets in current use, the Aerovox Corporation of Brooklyn, N. Y., is issuing supplementary bulletins from time to time bringing the listings up to date. The latest bulletin just issued carries an impressive array of replacement units. New items are being added to the line as rapidly as the demand warrants an economical production schedule. Types not listed may be obtained by submitting samples of condensers which have failed in service together with data as to the sets in which they are used, capacity and voltage ratings. The exact duplicate replacement condenser bulletins are available on request.

DAYRAD
Radio Service Equipment
Represented by
FRANK A. EMMETT CO.
1341 South Hope St.
Los Angeles, Calif.
Richmond 6301

Only GRUNOW
HAS THE SUPER-SAFE
REFRIGERANT...

Carrene

* And only Grunow offers you such amazing beauty, such outstanding performance, and such a low price for this kind of quality in an electric refrigerator.

There are three sizes to select from—each economically priced

GRUNOW
ELECTRIC REFRIGERATOR

Distributed by
Watson & Wilson, Inc.
711 MITCHELL PLACE
Los Angeles

GRUNOW
HAS THE SUPER-SAFE
REFRIGERANT...

Carrene

"You bet I got my
10c WORTH"

thousands of servicemen have sent for this
valuable book... GET YOUR COPY FOR 10c

"Yes, sir, this book has been worth
money to me. It just cost me a
dime, but that was sure 10c well spent!
I never saw a book crammed with
so much useful information for radio men."
Yes, and 36,000 other service men feel
the same way. We wish you could read
some of the letters we've received. Men in
California, Texas, New York write in
and tell us that this handy service
manual has actually put money in their pockets.

It's yours for 10c in stamps!

10c TECHNICAL MANUAL 10c

Hygrade Sylvania Corporation
Emporium, Pa.

Please send me the new Sylvania Technical Manual. I enclose 10c in stamps.

Name

Address

City  State
NEW UNIVERSAL CATALOG

The spring catalog for the Universal Microphone Co., Inglewood, Cal., came off the press late in March in the form of a loose leaf supplement in standard binder size. It was issued in two sections with microphones in part one and recording apparatus in the second part.

The microphone section includes standard microphones, transformers, input stages and remote control panels. The recording section includes the new professional recorder, the new full frequency celluloid discs, needles, etc.

NEW MILLER ITEMS

The J. W. Miller Company, manufacturers of inductances, short wave, all wave, and pre-selector kits announces a number of new items and kits to the trade. Descriptive literature on these new items may be secured by writing the factory.

After studying the cosmic ray meter records of the Settle-Fordney stratosphere flight Doctors A. H. Compton and R. J. Stevenson of the University of Chicago concluded cosmic rays are charged particles rather than radiant ray super gamma rays.

WHOLESALE SERVICE FOR THE DEALER

RADIO REPAIRS
SPEAKER REPAIRS
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SPECIAL EQUIPMENT BUILT TO ORDER

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NEW FACTORY
833 VENICE BLVD.
TELEPHONE PROSPECT 5333

MISSION BELL
RADIO MFG. CO., INC.

CAN YOU AFFORD To Deprive Your Business of TRIUMPH EQUIPMENT?

MODEL 400 Tube Tester


"HOT" NEON LEAKAGE TEST

Sensitive foreign broadcast receivers particularly MUST have quiet tubes. High resistance inter element leakage causes noise. The Triumph "neonized test" checks every tube element separately for leakages—even as high as five megohms.

GOOD OR BAD

Your customer can see immediately if his tubes should be replaced. The meter is plainly marked "Good" and "Bad," with no doubtful area. The neonized test is also clearly marked for customer's understanding.

UNPRECEDENTED

Never before has a dynamic mutual conductance tester, with so much appearance and tube sales ability, been offered at this low price.

娉  生 市  貴  市

MODEL 110 Signal Generator

Direct reading vernier airplane dial. Calibrated from 100 K.C. to 30 Megacycles in two colors. Individual alignment frequencies spotted in contrasting color. Genuine, four step, T pad attenuator. Output power variable, zero to 500,000 microvolts, through reversible plug. Attenuator graduated in approximate microvolts. Electrostatically and Electromagnetically shielded and filtered for attenuation to zero.

Self-compensated, electron coupled oscillator, modulator guarantees stability at all frequencies.

400 cycle audio for 40% modulation, also separately available for Audio or P.A. work, fully attenuated. Unmodulated carrier at the snap of a switch for heterodyning, microphonics tests, etc.

Powered by 110 volt A.C.—No Batteries, No Hot Resistance Cords—consistently dependable output power. No one but Triumph has thought of putting the common test frequencies in color for easy reference—but here they are—175 K.C. —262 K.C. 456 K.C. I.F. and 600 K.C.—1000 K.C. and 1400 K.C. at broadcast. All are specially marked for ready tuning and quick, lower cost repairs—a convenience you'll appreciate more, the more you use it.

California $36.20 Counter or Portable

California $31.25 Complete

Write for Your FREE Copy of the TRIUMPH SIGNAL GENERATOR HAND BOOK and SHOP NOTES

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COAST ELECTRIC CO., San Diego
California Representative:
NORMAN B. NEELY, 1656 North Serrano Street, Los Angeles