



radio
service
dealer

Merry
Xmas

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Light Up — It Pays!

Dealer Accounting Methods

Transformer & Speaker Chart

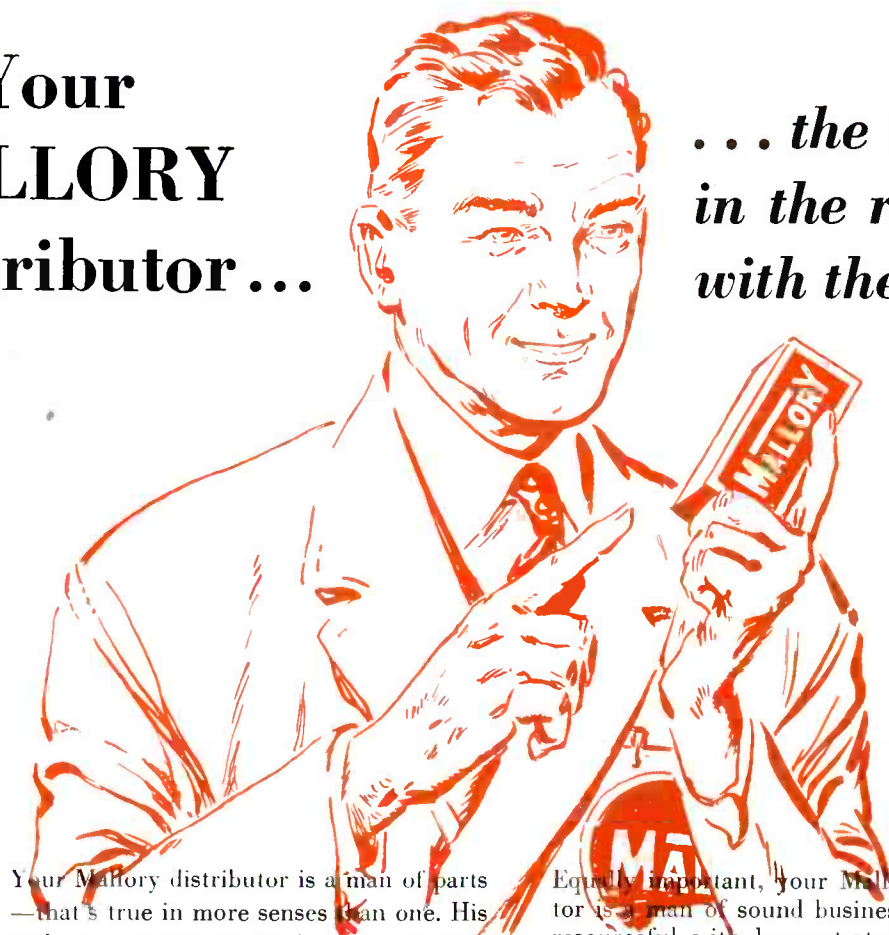
How To Choose Test Equipment

**DIRECTORY OF RADIO AND
APPLIANCE DISTRIBUTORS**

**December
1945**

Your MALLORY Distributor...

... *the right man,
in the right place,
with the right help*



Your Mallory distributor is a man of parts—that's true in more senses than one. His replacement items are the best you can buy. His experience will help you locate them *quickly*—assist you, too, in installing them properly. If a particular item is impossible to get, he'll find you the best possible substitute.

Equally important, your Mallory distributor is a man of sound business judgment, resourceful, with demonstrated qualities of leadership. He'll assist you in problems of sales and management—even help you in training personnel. Your Mallory distributor is a good man to cultivate. He's been especially appointed because of his *capacity* and *willingness* to serve.

Here's What He'll Do For You:

- 1 Offer you a complete line of Mallory replacement parts . . . many of them first developed by Mallory research . . . ALL of them guaranteed against premature failure by years of service in the field.
- 2 Meet the maximum number of your application needs with the minimum number of parts. His program of Mallory Standardization will reduce your investment, simplify replacement, speed up delivery.
- 3 Give you detailed information on prices, parts, catalog numbers . . . work his head off to get you the items you need when you need them . . . give you prompt, efficient service *always*.
- 4 Provide you with bulletins, booklets, catalogs, letters, giving complete data on what to use and where to use it . . . offer you special publications and new developments and technical service fundamentals.
- 5 Offer his own personal experience in helping you solve unusual or difficult problems . . . help you train sales and service personnel . . . give you the extra help you need to meet emergencies.
- 6 Provide you, if asked, with sound methods of keeping your business on the beam . . . give you special promotion materials to help you sell your story to the public.

The Part Your Mallory Distributor Plays Is Important TODAY—to YOU!
P. R. MALLORY & CO., Inc., INDIANAPOLIS 6, INDIANA



More than ever —
ALWAYS
INSIST ON

P. R. MALLORY & CO. Inc.
MALLORY
APPROVED
PRECISION PRODUCTS

VIBRATORS • VIBRAPACKS* • CONDENSERS
VOLUME CONTROLS • SWITCHES • RESISTORS
FILTERS • RECTIFIERS • POWER SUPPLIES

ALSO MALLORY "TROPICAL"* DRY BATTERIES, ORIGINALLY DEVELOPED BY MALLORY FOR THE U. S. ARMY SIGNAL CORPS, NOT PRESENTLY AVAILABLE FOR CIVILIAN USE.

*Reg. U. S. Pat. Off.

THIS NEW MIGHTY MIDGET



No. 412

has changed the lives
of this whole family of
"MINI-MAX" BATTERIES



No. 482



No. 467



No. 420

The four batteries shown above are approximately $\frac{1}{3}$ of actual size

EVEN BEFORE PEARL HARBOR, battery construction principles developed by National Carbon Company were making possible new strides in portable radio and electronic equipment. Then came the war. The company was called upon to develop even more radical improvements in battery construction to meet the needs of light and extremely portable military communications of all types, and so the tiny $22\frac{1}{2}$ volt "Eveready" "Mini-Max" "B" battery was born—a battery well under half the size of anything of comparable voltage—easy to carry as a match box!

This is what this new, improved battery construction means. It means a brand new line of portable radio equipment—equipment that will give the idea of the "personal radio" an entirely new meaning. It makes possible radio sets for individual use—sets so small that they can be slipped into the pocket of a vest, or carried in a woman's handbag. Portable radio business will not merely pick up where it left off December 7, 1941. It will be years ahead of itself.

Engineers and designers are already aware of the possi-

bilities of this new battery. They are already at work on new radio and electronic devices which exploit its portability. And at this time may we invite all these creative men to avail themselves of our experience, our laboratories and to consult with our engineers. National Carbon Company, Inc. extends to you complete cooperation.

The words "Eveready" and "Mini-Max" are registered trade-marks of National Carbon Company, Inc.

Now that radio batteries are back again, National Carbon Company is offering an extremely useful new Portable Radio Battery Replacement Guide. Write for your copy today to our nearest Division Office listed below.

NATIONAL CARBON COMPANY, INC.

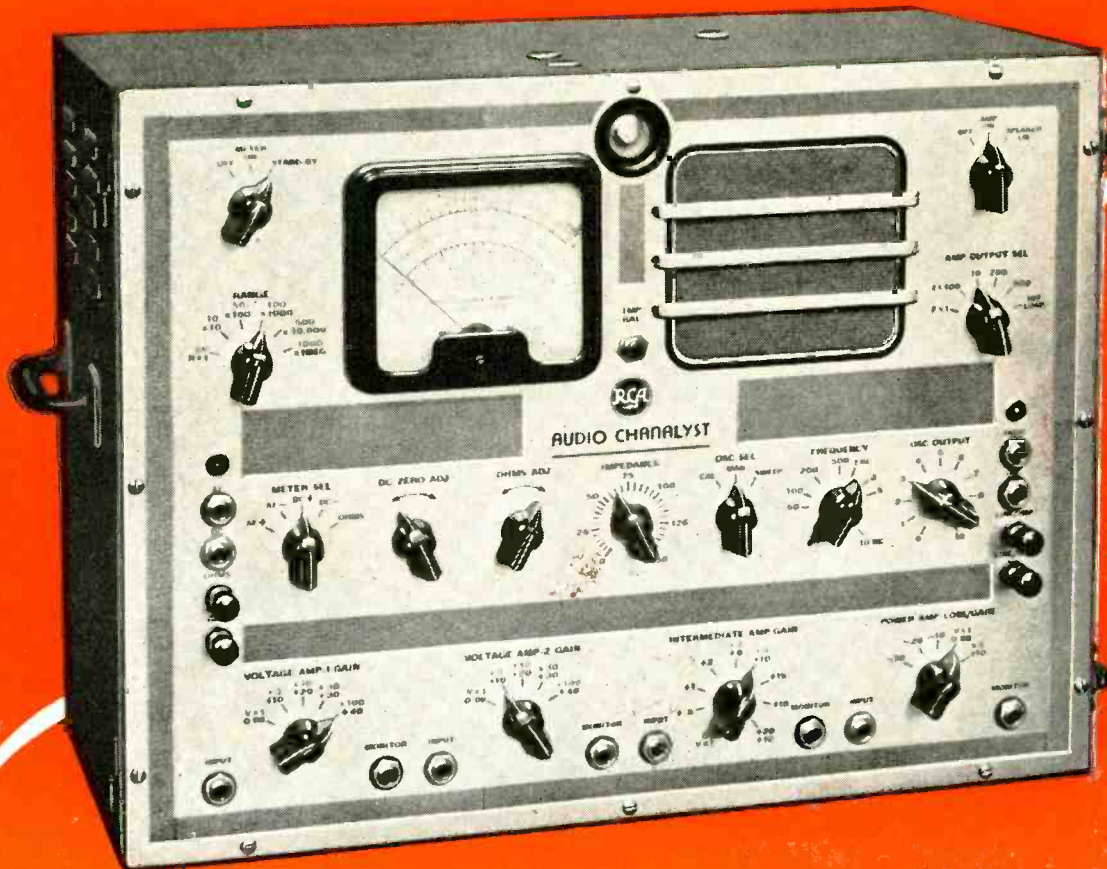
Unit of Union Carbide and Carbon Corporation



General Offices: NEW YORK, N. Y.

Division Sales Offices: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco.

*A complete, compact test-bench
in a single unit!*



...the new **RCA 170-A AUDIO CHANALYST**
that tests everything—from microphone to multiple speakers

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Use The Coupon

Test & Measuring Equipment
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Camden, New Jersey
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about the new RCA 170-A
Audio Chanalyst.

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Company.....
Street.....
City.....State.....
97-6136-110

- With the 170-A you can systematically test any sound system completely for failure to operate, weak output, interrupted operation, and distorted or noisy output.
- You can check the presence, absence, or character of a signal throughout its path—from source to load.
- You can check gains or losses, measure component values, and test the voltages of any item supporting or controlling the signal.
- You can narrow down poor performance to its cause, and locate the defective part in an amazingly short time.
- You can use it to solve signal-interruption problems by multi-channel monitoring.
- In an emergency, you can use the RCA Audio Chanalyst to substitute for defective amplifiers by bridging the signal through it, and thus around the defect.

BUY MORE WAR BONDS



RADIO CORPORATION OF AMERICA

RCA VICTOR DIVISION • CAMDEN, N. J.
In Canada, RCA VICTOR COMPANY LIMITED, Montreal

radio service dealer

Member Audit Bureau of Circulations

Covers all phases of radio,
phonograph, sound and elec-
trical appliance mer-
chandising and servicing

VOLUME 6 NUMBER 12

DECEMBER, 1945

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R. W. T., world's oldest and largest Radio Supply House, is ready again with tremendous stocks of sets, parts and equipment. You can depend on our quarter-century reputation for quality, sound values and super-speed service. Orders shipped out same day received. All standard lines already here or on the way, including: National, Hammarlund, R. C. A., Hallicrafters, Bud, Cardwell, Bliley and all the others you know so well.

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ORIGINATORS AND MARKETERS OF THE FAMOUS *Lafayette Radio*



R.W.T. DEPT. SL5, 100 AVENUE OF THE AMERICAS,
NEW YORK 13, N. Y.

I want your big new post-war Catalogue.

NAME _____

ADDRESS _____

HAM? (CALL LETTERS) _____

ENGINEER? SERVICEMAN? STUDENT?



Now **YOU**

THIS IS TO CERTIFY THAT
Frank's Radio Service
 has met the requirements to qualify as
RAYTHEON BONDED ELECTRONIC TECHNICIANS
A Surety Bond Has Been Issued by the
WESTERN NATIONAL INDEMNITY COMPANY,
 Expiring the _____ day of _____, 19____, Binding This Firm to:

1. GUARANTEE ITS RADIO REPAIR WORK FOR 90 DAYS FROM DATE PERFORMED and REPLACEMENT PARTS FOR 90 DAYS FROM DATE INSTALLED.
2. Use only parts of recognized quality in its repair work.
3. Not charge more than list price for parts installed.
4. Test customers' tubes as accurately and reliably as possible.
5. Keep charges for labor at a fair and reasonable level.
6. Perform only such work as is authorized.
7. Maintain the high quality service indicated by the experience required of all Bonded Electronic Technicians.
8. Maintain and use test equipment essential to good repair work and reliable tube checking.

Signed and Sealed

By _____
 RAYTHEON MANUFACTURING COMPANY
 A. E. ALLEN, District Sales Manager

By _____
 WESTERN NATIONAL INDEMNITY COMPANY
 A. J. YALOWITZ, Secretary in Charge
 Real, Chiropractors and Veterinaries - 172 West Jackson Street, Chicago 4, Illinois



can become a

BONDED ELECTRONIC TECHNICIAN

If you can qualify for this new, revolutionary Raytheon merchandising program, you can be sure of greater sales and profits than ever before . . . and you can forget your worries about "security" in the peacetime years ahead.

This program is the perfect answer to those who have been suggesting licensing, government regulation and other impractical "remedies" to protect the public from unethical radio service dealers.

The bond certificate illustrated, showing the code of ethics and 90 day guarantee, and backed by one of the nation's largest surety firms, will be issued to *each* service dealer who can meet the necessary qualifications.

It is only one unit in a *complete* plan which includes the largest, most effective selection of displays and helps ever offered to the radio tube industry.

As a Bonded Electronic Technician, you will **STAND OUT** in your community as the **TOP** radio service dealer . . . the one to be trusted with all kinds of radio service, the one in whom the public can have complete confidence.

So for more service business, increased sales of tubes and other parts, apply to your Raytheon distributor to become a Bonded Electronic Technician. Remember, for your protection Raytheon tubes are distributed only by leading parts wholesalers.

Raytheon
Manufacturing Company

RADIO RECEIVING TUBE DIVISION

NEWTON, MASS. • LOS ANGELES • NEW YORK • CHICAGO • ATLANTA

RAYTHEON
Radio Tubes



DEVOTED TO RESEARCH AND THE MANUFACTURE OF TUBES FOR THE NEW ERA OF ELECTRONICS

**POST ADVERTISING PAGES
HAVE SPOKEN
FOR MORE YEARS,
WITH MORE AUTHORITY,
TO MORE PEOPLE
WITH MORE INFLUENCE,
THAN THOSE OF ANY OTHER MAGAZINE**



AS new models appear, millions turn first to the advertising pages of the Post for a preview of the new radio, phonograph and television sets. Leading radio dealers know that these Post readers form the nucleus of those who are the first to buy the new and better models.

Post readers are alert to all that is new and progressive. Their living standards and incomes are high above the average. They have the money to buy the things they want.

Year after year, in every community, in every neighborhood, in every income group—Post readers are the first to buy the new and better things. They set the pace, creating and influencing the demand that establishes brand preference.

That is why leading radio dealers from coast to coast find it pays to feature brands that are featured in the Post.

THE SATURDAY EVENING
POST

Survey after survey proves that people pay more attention to advertising in The Saturday Evening Post than in any other magazine.



with the publisher.....

Production Still Retarded

OPA seems to be a great stumbling block on the road to speedy reconversion. No industry that we know of is even partially satisfied with the directives OPA enforces upon it regarding pricing and profit margins. Result: production dribbles for "sampling only" — no sales, no profits . . . just anticipation!

Price Administrator Chester Bowles rejected the proposal of a national retail committee that OPA allow manufacturing cost increases to be passed on automatically to the retailer and then on to the consumer. He contended it was a dangerous move towards inflation. He forgot to consider that the

Fair-Trade Trends

SEVERAL of the nation's major manufacturers of electrical appliances have recently adapted a fair trade policy whereby their product's cost prices become uniform throughout the country and selling prices must be maintained as fixed by the manufacturer in the 46 state (all states except Texas, Missouri and the District of Columbia) where Fair Trade laws are in effect.

The drug industry was the first to try Fair Trade regulations and it has been rather beneficial to

We Disagree With "Ad-Age"

THE very highly regarded journal for men in the advertising business, "Advertising Age," stated editorially on November 12th, "the Radio Industry celebrated its 25th birthday last week . . . 'the infant prodigy' is no longer an infant . . . has reached full growth . . . enters its 26th year with a hatful of new ideas. It seems safe to predict that radio has grown to full maturity." Now how do you like that? Calling us a full grown industry! Why we're in our very earliest youth, and the things we've done in the past quarter-century are like child's play to what we're about to do in the next.

On the subject of predictions, let's give out with a few of our own: We predict that the time will soon come when we'll toast bread and cook meals

Standard Brands

WITH all the power at our command we urge Service Dealers to stick to standard brand merchandise. The market is fast becoming flooded with appliances, radios and replacement parts of unknown and questionable manufacture. Buying such stuff is fraught with danger. The good-will of every customer is jeopardized when such items

public is smart and will not pay unreasonable prices, in fact will not have to worry about rising prices if manufacturers are allowed to compete in the good old bitterly competitive manner that spells mass production and lowered selling prices. Take free enterprise away from industry and it stagnates. Look what Ford once did to force car prices down to where everyone could afford an auto. Now, under OPA regulations Ford is almost out of business, and car prices are way up.

Common sense would indicate that OPA has more than outlived its usefulness. Industry and the Public should demand that our Constitutional rights be returned—and in the natural course of events everyone will be better off.

the majority, especially the larger manufacturers. But in the radio and electrical appliance field it would seem to us the dealer has "an out," or evasive tactic. He can sell a price-fixed item as required, but he can "stretch" his trade-in allowance, which in effect represents price-cutting below fixed levels.

We do not oppose price-fixing by manufacturers, for that is their right under our laws, but we hate to have to operate under OPA price-fixing, for that seems to be a loss of public franchise.

in a matter of seconds, via high-frequency radio-actuated circuits. And what about Facsimile? It'll allow every man to have his own newspaper published in his own home nightly while he sleeps. Talk about automatic light control! If architects don't start collaborating with radio engineers soon so that buildings can be built properly, with automatic light control, sound distribution systems properly installed, and the like—their efforts will be as obsolete as tents are. We could spend hours telling you about "new" radio gadgets that are about to become commonplace and matter-of-fact. Why bother! We're proud of our youth and we don't want "Ad-Age" to even hint that we've slowed down. Heck, we haven't even started to grow up . . . but when we do, . . . well, the old-fashioned way of making babies was "so nice."

are sold. Loft manufacturers who make the "junk" are here today, gone tomorrow. They clean up and leave others holding the bag.

S. R. Lowan
Publisher

Finer in Performance AND NOW — Smarter in Appearance with

INTERCHANGEABLE COLORED FLANGES

ROUND OR SQUARE... AT NO EXTRA CHARGE



Marion Glass-to-Metal Truly Hermetically Sealed 2½" and 3½" Electrical Indicating Instruments

- 12 different iridescent colors—blue, red, green, silver, gold, etc.—in keeping with the modern trend of high-styling radio and electronic equipment. Supplied on special order at no extra charge.
- Interchangeable round or square shapes simplify instrument stocking problems; a minimum stock permits universal application of the two basic Marion "hermetic" instruments.
- The eye-appeal of these colored flanges will be especially welcomed among the ham and experimenter market. The bright colors will also lend themselves to attractive window and interior displays.

Remember—Marion "hermetics" cost no more than most competitive unsealed instruments. And they're being delivered in ever-increasing quantities. For details of a Marion Franchise, write to our Jobber Sales Division.



MARION ELECTRICAL INSTRUMENT CO.

MANCHESTER, NEW HAMPSHIRE

Jobber Sales Division: Electrical Instrument Distributing Co.
458 BROADWAY NEW YORK, N. Y.

RADIO SERVICE DEALER—*the only monthly trade paper that devotes one-half of its text to Merchandising and one-half to*

Technical Subjects

**offers this special
REDUCED PRICE
SUBSCRIPTION RATE**

Good UNTIL FEB. 1, 1946

"RSD" is subscribed to by more owners and managers of the Nation's Leading Service Dealer establishments than any other monthly trade journal.



**TEAR
OUT**



RADIO SERVICE DEALER

SPECIAL REDUCED RATE OFFER —
U. S. Subs. — \$3 for 3 yrs. Foreign Subs. — \$5 for 3 yrs.

(Remit by Check or Money Order. We cannot assume responsibility for cash sent thru mails)

Good only until Feb. 1, 1946.

COWAN PUBLISHING CORP.

342 Madison Ave., New York 17, N. Y.

Sirs: Here is my check (or money order) for \$..... Enter my subscription order for the next 36 issues. The information given below is accurate. If my subscription is rejected I expect an immediate refund in full.

Regular Subscription Price: 12 issues \$2.—24 issues \$3. Canadian and Foreign subscription are \$3 annually.

Name (print carefully)

Address City State

Firm Name Year Est. 19.....

OWNER
DEP'T MGR.
EMPLOYEE

If some other classification or occupation, state it on the line below:

Please check whether firm is

- | | | |
|---|--|--|
| <input type="checkbox"/> Radio Dealer | <input type="checkbox"/> Radio Wholesaler | <input type="checkbox"/> Hardware Store |
| <input type="checkbox"/> Radio Service Organization | <input type="checkbox"/> Music Store | <input type="checkbox"/> Electrical Appliance Dealer |
| <input type="checkbox"/> Automotive Store | <input type="checkbox"/> Any other classification (State it) | |

The Best-Known Name in Tubes



offers you the best
chance to build
your service
business

Listen to
"The RCA Victor Show,"
Sundays, 4:30 P.M.,
EWT, NBC Network

In Metal, Miniature, or Glass—

THE FOUNTAINHEAD OF

MODERN TUBE DEVELOPMENT IS RCA



62-6636-99

RADIO CORPORATION OF AMERICA

TUBE DIVISION • HARRISON, N. J.

LEADS THE WAY . . . In Radio . . . Television . . . Tubes . . .
Phonographs . . . Records . . . Electronics

New!

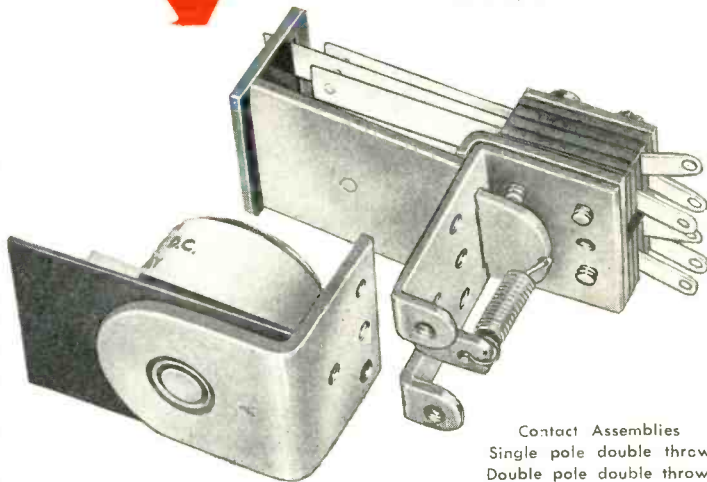
Series 200

A RELAY BY GUARDIAN with Interchangeable Coils

BUILT IN TWO PARTS

A. C. Coil Assemblies available for 6 v., 12 v., 24v., 115v.
D. C. Coil Assemblies available for 6 v., 12 v., 24 v., 32 v., 110 v.

★Two basic parts — a coil assembly and a contact assembly — comprise this simple, yet versatile relay. The coil assembly consists of the coil and field piece. The contact assembly consists of switch blades, armature, return spring, and mounting bracket. The coil and contact assembly are easily aligned by two locator pins on the back end of the contact assembly which fit into two holes on the coil assembly. They are then rigidly held together with the two screws and lock washers. Assembly takes only a few seconds and requires no adjustment on factory built units.



Contact Assemblies
Single pole double throw
Double pole double throw

On Sale at Your nearest jobber NOW!

See it today! . . . this amazing new relay with interchangeable coils. See how you can operate it on any of nine different a-c or d-c voltages — simply by changing the coil. Ideal for experimenters, inventors, engineers.

TWO CONTACT ASSEMBLIES

The Series 200 is available with a single pole double throw, or a double pole double throw contact assembly. In addition, a set of Series 200 Contact Switch Parts, which you can buy separately, enables you to build dozens of other combinations. Instructions in each box.

NINE COIL ASSEMBLIES

Four a-c coils and five d-c coils are available. Interchangeability of coils enables you to operate the Series 200 relay on one voltage or current and change it over to operate on another type simply by changing coils.

Your jobber has this sensational new relay on sale now. Ask him about it. Or write for descriptive bulletin.



GUARDIAN ELECTRIC

1605-P W. WALNUT STREET CHICAGO 12, ILLINOIS

A COMPLETE LINE OF RELAYS SERVING AMERICAN INDUSTRY



the man from the Happy Oven



Eat well and be merrie for tume is swift

BELIEVE IT OR NOT, the bakery where he worked *was* named The Happy Oven. Roger Dahlhjelm kept books there—for \$6 a week—eleven years ago. Today he's the head of a \$7,500,000 a year business in Hollywood. Dahlhjelm, the Stubborn Swede, founded Hollywood's fantastically successful Farmers Market in 1934. Parlaying \$6 a week into 7½ million dollars a year is smart doing, if you do it. Dahlhjelm did. Anybody can, he says . . . "Money's all around you, sitting and wistfully waiting to fall in love with your idea." Charles Samuels' story of Dahlhjelm, "Farmer's Friend"—in the December

TRUE—is one of the absorbing TRUE stories of high adventure in business. TRUE's readers are as eager to hear about *this* as they are about derring-do in Micronesia or elk-hunting 'way up in Labrador. TRUE is filled with man-sized excitement about everything men are interested in. It's vital and it's varied. More than ¾-million men will pay a premium price—25¢ a copy—to buy the December TRUE at their newsstands. More than 130 different advertisers are spending 361% more in TRUE in 1945 than last year. This December issue carries over 70 pages of advertising! TRUE is America's fastest-growing man's magazine. There's nothing like TRUE to sell men for you.

a **True** AD-Venture

Edward E. Hibshman & Associates, the Cleveland advertising agency, ran a 1-column ad for a client in the October TRUE. Buried in the small body type was the free offer of a picture. On September 12 — one week after TRUE reached the newsstands — Mr. Hibshman wrote: "At least 2,000 requests already, and more coming in. Don't let anyone tell you TRUE doesn't have pulling power!"

25¢

THE MAN'S MAGAZINE

True

Sells men for you

FAWCETT PUBLICATIONS, INC.
295 Madison Avenue, New York 17, N. Y.
World's Largest Publishers of Monthly Magazines

In & Around the Trade

Being a condensed digest of production, distribution and merchandising activities in the radio and appliance trade.



Mr. Charles R. Wexler, chief engineer at John Meck Industries, Plymouth, Indiana, showing a new Meck set to Miss Jeanne Yahn, Mrs. Tom Lung, and Miss Jerry Nesbitt of Burroughs Radio.

STANDARD LABELING RECOMMENDED

Urging that the radio industry adopt an "informative labeling policy to protect the consumer against inferior merchandise," Joseph Gerl, president of Sonora Radio & Television Corp., hit at "radio manufacturers whose production and merchandising policies leave much to be desired."

"The present wave of radio advertising," said Gerl, "with its emphasis on Superman electronics and Buck Rogers television, has left the consumer wide open to all sorts of inferior products for which the most fantastic claims have been made.

"Such advertising and merchandising policies are not the products of responsible radio manufacturers. Such policies in operation in the past may have temporarily enriched some individual manufacturer, but the industry as a whole suffered.

"The Radio Manufacturers Association can establish an informative labeling policy backed by an RMA label attached to each radio. The label would carry a description of the set's output, sensitivity and selectivity and also a statement of the RMA's minimal standards for that class of radio.

"By adopting such a policy of informative labeling, the radio industry will protect the consumer against in-

ferior products, develop a steady demand for well-built radios and protect the industry from members willing to mislead the consumer by building and ballyhooing shoddy merchandise.

"The radio industry has now come of age. Within the next three or four years, it will give a living to almost as many people as the automobile industry. We are no longer a small, curiosity-item industry, but one of America's great producers. Why, therefore, cannot we adopt an industry-wide policy in keeping with our national status, and treat the consumer as if he were entitled to an honest piece of merchandise, honestly priced and honestly labeled?"

Westinghouse Begins to Ship Radios

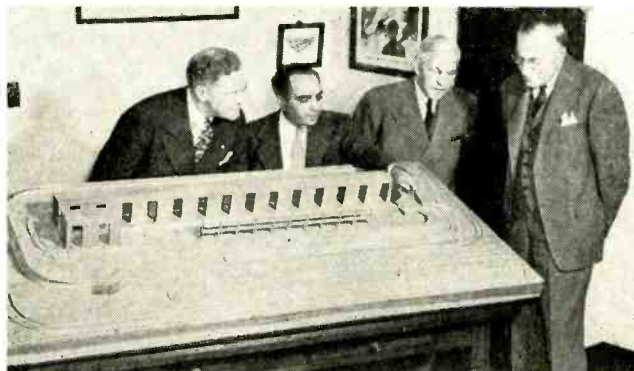
First Westinghouse post-war home radio receivers — forerunners of the 3000-to-5000 sets per day which will come from production lines in the Home Radio Division's seven-and-one-half acre plant in Sunbury, Pa. — have been completed and shipments begun to approximately 10,000 retailers throughout the United States, Alaska and Hawaii.

Included in the new line are nine distinctive sets ranging from an ultra-modern six-tube six-by-six-by-nine-inch portable table model — reminiscent in size and price of the first home radio receiver built by Westinghouse in 1921 — to an impressive 14-tube radio-phonograph combination set housed in a modified Chippendale console cabinet and equipped to receive standard broadcasts, foreign shortwave broadcasts and frequency modulation programs.

Prices, while not yet firmly established, are expected to range from about \$25 to \$350.

Although no television receivers are included in the first run, Division Man-

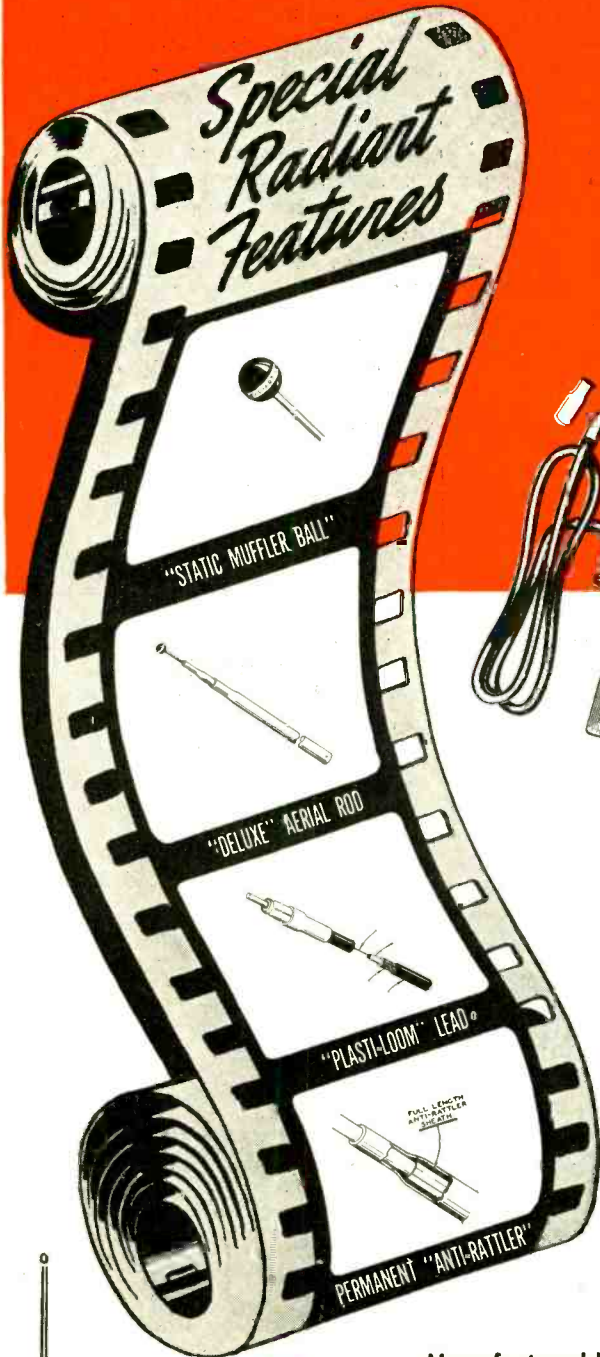
[see page 16]



Above—Messrs. H. Robertston, executive vice-president; J. Seminatore, superintendent of assembly; W. E. Fullerton, in charge of production and H. C. Bonfig, vice-president in charge of radio sales of Zenith Radio Corp., examine a small scale model of factory production lines.
Left—Brand new, medium priced General Electric ranges start rolling into assembly line production.

RADIART

1946 "DELUXE" AERIALS

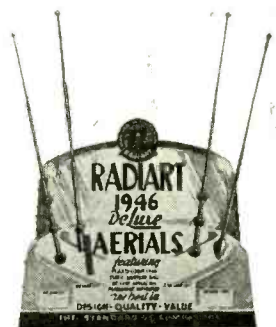


AGAIN . . . RADIART SETS THE STANDARD!

With new features — highest quality materials — and super values, RADIART AERIALS are the Sensation of 1946.

The "Plasti-Loom" Lead (long enough for all installations) and Antimonial Admiralty Brass are two outstanding Radiart features. They make RADIARTS greater values than ever before.

Also, every RADIART AERIAL is complete — no extras to buy — another reason why RADIART is the line to sell in 1946.



Ask your Radiart Jobber how you can get one of these snappy RADIART AERIAL COUNTER DISPLAYS.

Manufactured by the Makers of RADIART "Correct Replacement" Vibrators.



Radiart Corporation

3571 W. 62nd STREET

Export Division
25 Warren St., New York 7, N.Y.

CLEVELAND 2, OHIO

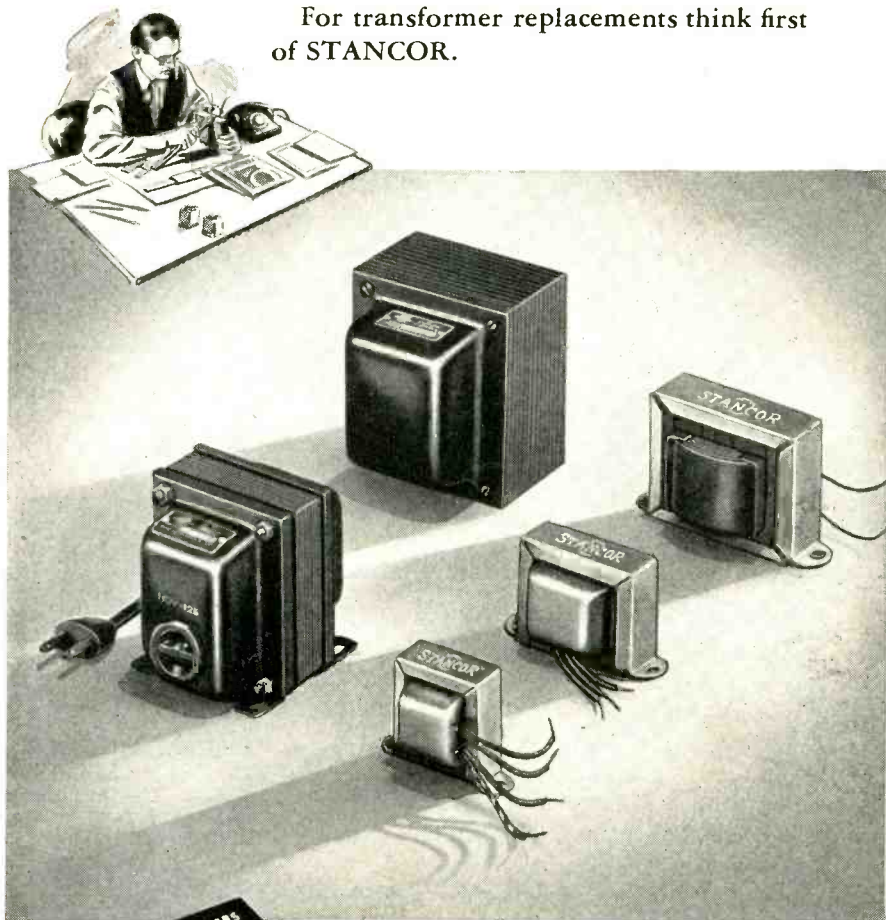
Canadian Office
455 Craig St., W., Montreal, Canada



MAKE your transformer replacements more profitable by specifying STANCOR Uni-dapt units. More adaptable because over 80% of all radio transformers now in use are replaceable with a standard Uni-dapt item.

It's this adaptability that makes STANCOR design complete, fulfilling the exact needs of radio serviceman, amateur, and electronic engineer in an economical manner.

For transformer replacements think first of STANCOR.



STANCOR

STANDARD TRANSFORMER CORPORATION
1500 NORTH HALSTED ST., CHICAGO 22, ILLINOIS

In Trade

[from page 14]

ager Harold B. Donley said these sets will be "ready for the market early next year".

Sales Aids for Tube Dealers

Multi-colored window display cards and streamers are included in a new line of sales aids for General Electric electronic radio tube dealers and distributors, it has been announced by the Tube Division of the company's Electronics Department and described in a four-page pamphlet ETR-12.

In addition to these items, the company is offering decalcomanias, wall plaques, a receiver tube technical manual, order blanks, price cards, radio repair stickers, job tickets, shipping labels and imprinted stationery. These sales helps are supplied on a no-charge basis with the exception of the stationery, the shipping labels and the job tickets.

The window display cards, according to Russell W. Metzner, sales manager of replacement tubes for the Division, measure 32 inches by 21 inches with an easel support and feature Bing Crosby in lively four-color reproduction.

"Wall plaques and streamers which measure approximately 18 inches by 8 inches, together with luminescent decals in bright colors, will be useful in dressing up store exteriors. Then, mounted price cards, order blanks, and a tube characteristic and performance manual will aid further in the tube dealers' store operation," Mr. Metzner adds.

A copy of Sales Aids, ETR-12, is available to G-E Tube Dealers on request to the Tube Division, Electronics Department, General Electric Co., Schenectady, N. Y.

Walkie-Talkie Controls Traffic

The first post-war civilian application of the B-48 walkie-talkie, originally manufactured by Emerson Radio & Phonograph Corp. for the British Army, was demonstrated on Navy Day by special officers, assisted by The Port of N. Y. Authority employees, on the George Washington Bridge.

Possessing a service range of approximately five miles, the walkie-talkie helped direct the heavy flow of traffic occasioned by the Presidential review of the Fleet. Operators stationed on and around the George Washington Bridge maintained constant contact with the main control station located on the Jersey side of

[See page 18]

Look at
these 3
OF 23 ARVIN VALUES



LOOK

AT THE SPECIFICATIONS
AND LOOK AT THE PRICES

● **VALUES LIKE THESE** can come only from a well-established manufacturer with the resources and facilities for mass production of Noblitt-Sparks Industries . . . an experienced organization with the proved ability to build top flight quality in low-priced merchandise.

● **VALUES LIKE THESE** make it possible for your customers to buy Arvin radios for upstairs, downstairs and all through the house . . . multiple sales that mean more profit for you.

● **These Arvin Top Flight Values** on their way to you are typical of the many others to come—fine floor and table radios and radio-phonographs, AM-FM, battery sets and three-way portables.

● See them at the Furniture Show
American Furniture Mart
666 Lake Shore Drive, Chicago, Ill.

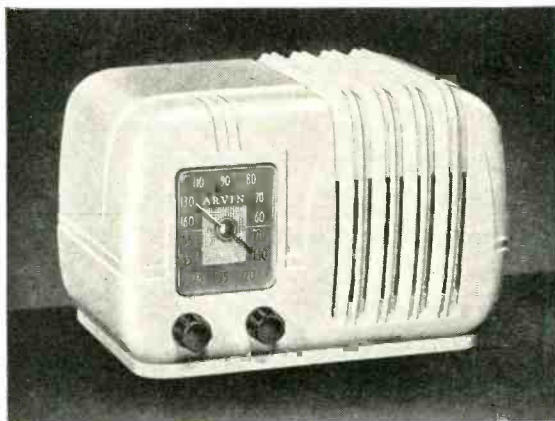


MODEL 444

Operates on AC or DC
Non-breakable cabinet with mar-resistant brown enamel finish. Size 6½" wide, 5¼" high, 4" deep . . . Four tubes including rectifier and two dual purpose tubes. Superheterodyne with 2-gang condenser. Standard broadcast. Direct-drive tuning. Enclosed back. Hank antenna extends 20-30 feet. This remarkably fine set with its trim lines and compact design will ring the cash register at

\$10.40*

Ivory Finish (Illustrated) \$10.55



MODEL 544

Operates on AC or DC
Attractive molded plastic cabinet in walnut finish. Size: 9½" wide, 6½" high, 5½" deep . . . Five tubes including rectifier and two dual purpose tubes. Superheterodyne with 2-gang condenser. Standard broadcast. Illuminated, easy-to-read dial, built-in loop. 5" permanent magnet speaker. Top flight performance and cabinet beauty that make multiple sales at approximately

\$15.40*

Ivory Finish (Illustrated) \$15.65



MODEL 664

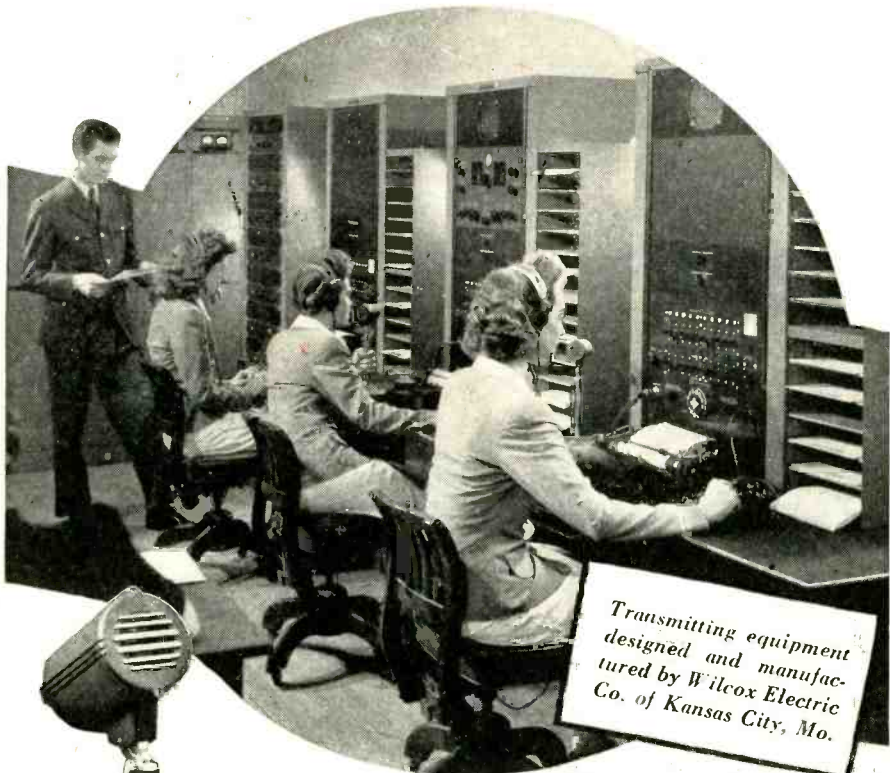
Operates on AC or DC
Beautifully styled walnut plastic cabinet, bottom-loading chassis, convenient handle. Size: 12½" wide, 7¼" high, 7" deep . . . Six tubes including rectifier and two dual purpose tubes. Superheterodyne with 3-gang condenser, full RF stage and audio-frequency correction. Standard broadcast. Vernier tuning. Continuously variable tone control. Built-in loop. 5" permanent magnet speaker. An extremely selective and sensitive radio. Big set quality with small set convenience and unequalled price-appeal at approximately

\$25.60*

Ivory Finish \$25.90

*ALL PRICES INCLUDE TAX — SLIGHTLY HIGHER IN FAR WEST.

NOBLITT - SPARKS INDUSTRIES, INC., Columbus, Indiana



Important INSTALLATIONS

Include Astatic Microphones for Long, Dependable Service

● Astatic Crystal and Dynamic Microphones, long recognized for dependable, efficient service, have many uses and applications. That's why you find them included in

many important installations such as the airline control and dispatching office, illustrated above, public address and inter-office communicating systems, police call stations, recording sets, and other types of modern communication systems. Astatic Microphones and Phono-graph Pickups are known and used around the world.

ASTATIC Crystal Devices manufactured under Brush Development Co. patents.

THE Astatic CORPORATION
 CONNEAUT, OHIO
 IN CANADA CANADIAN ASTATIC LTD., TORONTO, ONTARIO

In Trade

[from page 16]

the Bridge. Instructions transmitted by officials, stationed at headquarters, to officers equipped with walkie-talkie sets co-ordinated human and vehicular traffic on the Bridge.

The Federal Communications Commission issued a special one day pass to the Port Authority for use of the frequency band assigned to this type of portable receiver-transmitter. Emerson provided the sets.

Mallory Issues Replacement Vibrator Guide

The largest, most comprehensive edition of the 17 issued since 1934 is now offered without charge to those who request from P. R. Mallory & Co., Inc. a copy of their New Replacement Vibrator Guide.

Much new material has been added. There is a whole section devoted to buffer capacitor circuits and another section shows how to service old radio sets that need obsolete or discontinued types of vibrators. Another section contains a cross-index listing of all vibrator types. Copies may be obtained either from the manufacturer or Mallory Distributors.

Company Review

Donald MacGregor, Webster executive vice president, announces a new book just issued, "The Story of Webster-Chicago." The book will prove of general interest in the future as a typical case history of a pioneer manufacturer in the electronics field throughout long period of growth and development — to the greatly expanded facilities now nearing completion—particularly with reference to phono-graph record changers, wire recorders, power units, and kindred products.

A copy may be had by writing Webster-Chicago, 3825 W. Armitage Ave., Chicago 47, Illinois.

Marshall Field Adds Scott Line

An exclusive dealer franchise for the Chicago area has been granted Marshall Field and Company by the Scott Radio Laboratories, Inc., it was announced by E. J. Halter, vice-president of the Scott Radio Laboratories. Marshall Field and Company will be the only retail establishment in the Chicago area where consumers can purchase Scott radio products.

Stromberg Surplus

Lloyd L. Spencer, vice-president and general sales manager of the Strom-

[See page 20]

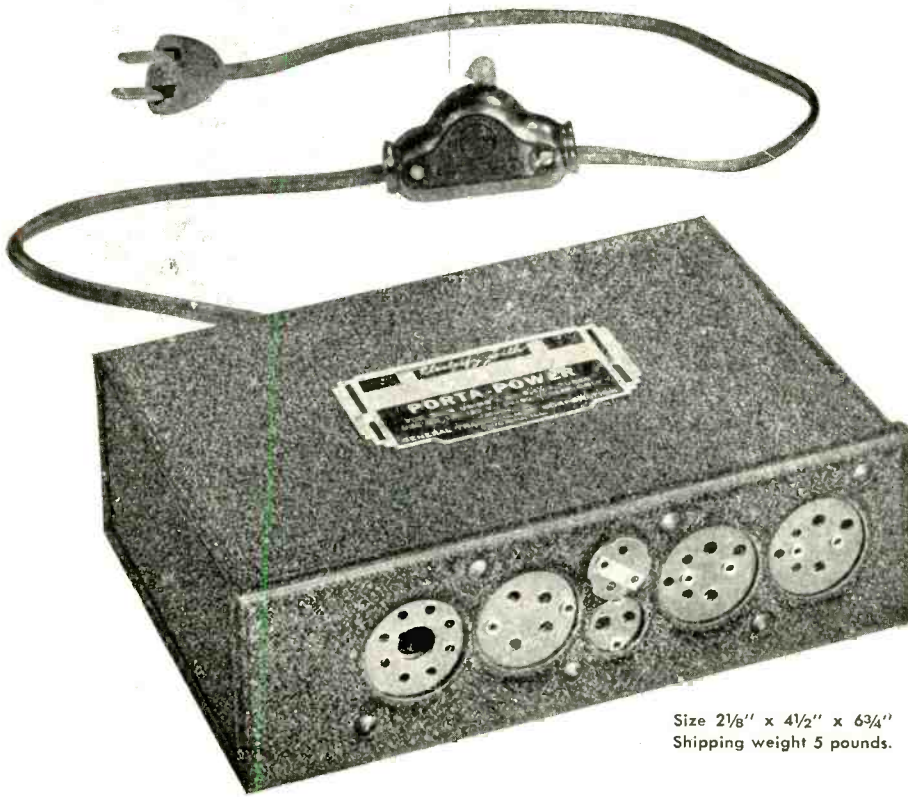
New!



Porta-Power MODEL "H"

featuring . . .

HUM - FREE OPERATION



Size 2 1/8" x 4 1/2" x 6 3/4"
Shipping weight 5 pounds.

Two section filter, composed of three very high capacity condensers, and two oversized iron core chokes in the "A" supply: — and two high capacity condensers and an oversized choke in the "B" supply positively block out hum.

Universal sockets for battery plugs.

Fits in 99% of all portables.

Circuit designed for optimum voltage regulation and changes in line voltages.

Weights 4 1/2 Pounds — and every ounce essential to topnotch performance.

PROVIDES

"A"

1.5v at 200 m.a.
1.35v at 250 m.a.
1.55v at 300 m.a.
1.35v at 350 m.a.

"B"

90v at 13 m.a.
101v at 8.5 m.a.

of 4, 5, or 6 tube, 1 1/2 volt battery farm or portable radios from 105-125 volt, 50-60 cycle lines.

O.P.A. APPROVED

PRICE MODEL "H" \$15.00

Jobbers — write for details . . . Dealers — See your jobbers

GENERAL TRANSFORMER CORP. . .

1250 W. Van Buren St., Chicago 7, Ill.

ONLY 25¢
SEND FOR YOURS TODAY!

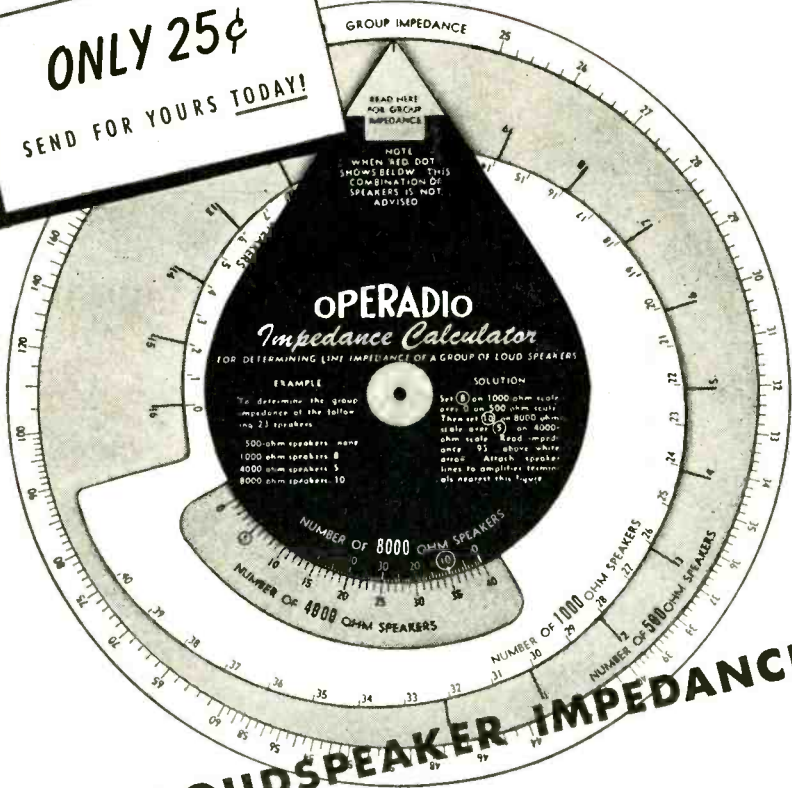


FIGURE LOUDSPEAKER IMPEDANCES
IN A FLASH!

You'll save time and money on loudspeaker installations with the handy Operadio IMPEDANCE CALCULATOR...a simple twist of a disc gives you instant answers to puzzling group impedance problems! You quickly match loudspeaker lines to the amplifier for any sound system covering 500, 1000, 4000, 8000, or 16,000 ohm loudspeakers. No rule-of-thumb guesswork...no involved mathematical formulas. Handy 5" diameter, fits your pocket or sales kit. Durable card stock, coated both sides, heavily varnished. Send coupon with 25c (not stamps) today!

OPERADIO
Sound Equipment

OPERADIO MANUFACTURING CO., DEPT. RS-12, ST. CHARLES, ILL.

Enclosed is 25c in coin (stamps not accepted). Send me your "IMPEDANCE CALCULATOR" by return mail.

Name _____

Address _____

City _____ State _____

In Trade
[from page 18]

berg-Carlson Company, announced the appointment of G. S. (Jerry) Gill as sales manager of the company's government surplus materials department. Mr. Gill recently resigned the post of deputy chief of the program planning section of the communications section of the War Production Board.

Beebe to S.N.C.

Mr. Jack Beebe, for many years connected with Thordarson Electric Mfg. Co., has joined the transformer division of the Swain Nelson Company of Glenview, Illinois, as sales manager.



Production of transformers by Swain Nelson Company has, until very recently, been almost wholly devoted to war work. Mr. Beebe states that soon S-N-C products will be available to cover the widest possible range of needs. Plans are to supply the standard types of transformers for service dealers and amateurs, also for general industrial and radio usage. Catalogs and literature will be available soon.

Aireon Offers Brochure

Aireon Manufacturing Corporation is following up an earlier preview with an attractive, four page brochure presenting illustrations, special features and electrical and mechanical specifications for its 50 Watt Ground Radio Station.

The 50 Watt Station, designed for small airports, airlines, and communication systems, is an RS-1 type, low power complete station, ready for installation.

Copies are available upon request to William Thom, Aireon Manufacturing Corporation, Kansas City, Kansas.

Frisch to R.W.T. Adv. Dept.

Harry Estersohn has been named assistant to I. J. Frisch, Advertising

[See page 60]



THEY'RE RADIO-ENGINEERED



*That's Why RCA Batteries
Will Outsell All Others!*



THE RCA radio battery line, streamlined to 35 Preferred Types, satisfies the requirements of 99% of all battery-powered radio sets. With your help, RCA batteries will outsell all others.

Built to radio standards, specifically for use in radio sets, RCA batteries are designed to give your customers more listening hours per battery dollar. Tell *that* to your customers and watch them buy!

RCA, with a quarter of a century of radio

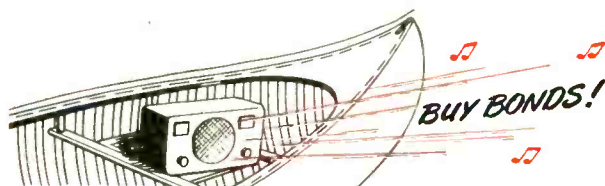
experience, is the best-known name in radio. And that name is working for *you!*

The RCA seal on your radio batteries is a guarantee of public acceptance, of public confidence, of public demand.

Listen to
"THE RCA SHOW," Sunday, 4:30 P. M., EWT
NBC Network



62-6736-109



RADIO CORPORATION OF AMERICA

TUBE DIVISION • HARRISON, N. J.

LEADS THE WAY... In Radio... Television... Tubes...
Phonographs... Records... Electronics

Tom Thumb Size . . .



A picture in Brief of the New
MALLORY
TUBULAR CAPACITORS

THIS picture is only *part* of a family portrait. It introduces three of a series of new tubular capacitors, stunted in size but long on performance.

Actually, the average capacitor in this new line measures less than the average cardboard type. But each is contained in an aluminum case. AND each is hermetically sealed. That means

double protection against moisture absorption and loss of electrolyte!

Single capacity units, common negative duals, separate section duals — you'll find them all among these diminutive newcomers.

Here are the successors to the "Universals" and the "Specials" — *quality* replacements, ideal for close quarters. See your Mallory distributor.

P. R. MALLORY & CO., Inc., INDIANAPOLIS 6, INDIANA



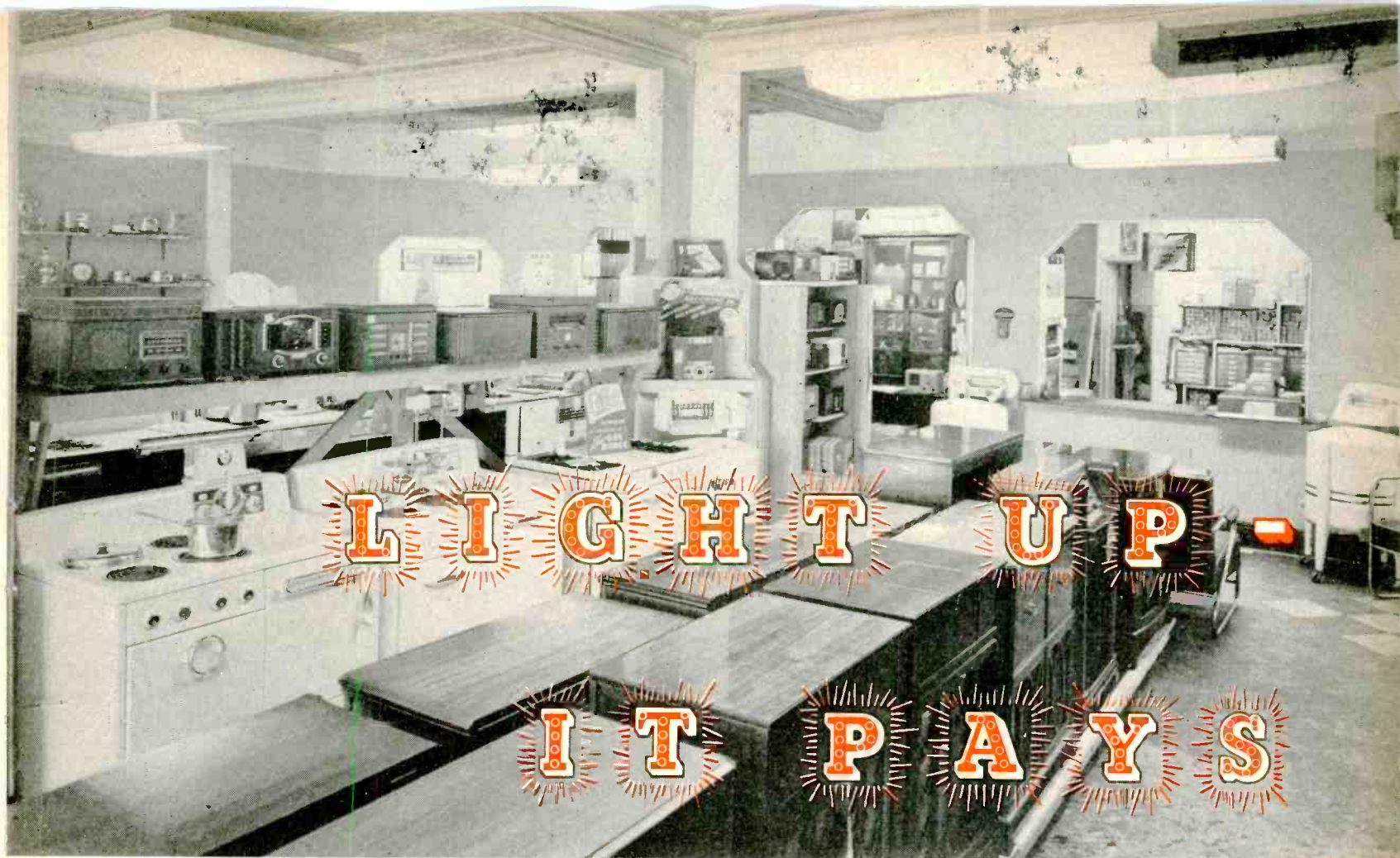
*More than ever—
ALWAYS
INSIST ON*

P. R. MALLORY & CO. Inc.
MALLORY
APPROVED
PRECISION PRODUCTS

VIBRATORS • VIBRAPACKS* • CONDENSERS
VOLUME CONTROLS • SWITCHES • RESISTORS
FILTERS • RECTIFIERS • POWER SUPPLIES

ALSO MALLORY "TROPICAL"™ DRY BATTERIES, ORIGINALLY DEVELOPED BY MALLORY FOR THE U. S. ARMY SIGNAL CORPS, NOT PRESENTLY AVAILABLE FOR CIVILIAN USE.

*Reg. U.S. Pat. Off.



by H. H. GREEN*

THE majority of radio service dealers know that, under the urge of production for war, the science of lighting has made striking progress. Stepped-up lighting levels in America's war plants resulted in stepped-up production, reduced accidents and errors. Although many radio-appliance stores have not yet fully utilized the newest lighting techniques, radio repair men have learned that good lighting is essential to good service. In many radio service operations which involve critical visual tasks, speed, accuracy and good workmanship depend on adequate lighting.

Because the sale of commercial lighting equipment during the war was limited largely to replacement, radio dealers have had little opportunity to apply in their sales departments the lighting lessons learned at their work benches.

Industrial lighting was making large technological advances throughout the time when war restrictions limited new installations in the retail field. Since early in 1942 when priorities were required on the use of much of the material that goes into store lighting fixtures, new tools have come into

*General Elec. Co., Nela Park

Merchandising experts recommend that featured merchandise, whether shown on floor or counter, in niche or island display, be lighted with extra intensities to attract extra customer attention. More emphatic lighting on displays soon will replace this store's typical fluorescent general lighting installation.

use, advanced techniques have been developed, and truly modern lighting standards have been evolved.

With the coming of peace, and the relaxing of most material controls, service dealers now have an opportunity to raise the lighting levels of their salesrooms, to use service lighting for selling. The procedure of seeing is the same in the shop as it is in the sales department. All vision results from the reflection of light, and the process is the same, whether the light is reflected to the eye of a repair man, or the eye of a potential customer. Better seeing in the radio store means better service as well as better handling.

With an estimated 25,000,000 customers waiting for new radio sets,

there is a tremendous job of merchandising ahead for radio dealers. They will need to take full advantage of every new and proven sales device, if they are to hold their own in the highly competitive days ahead.

They know that improved lighting has resulted in improved service in their shops, they realize that better lighting will result in better selling in their showrooms. In the simple problem of getting better light on a work bench, many repair men have achieved fairly satisfactory results from merely replacing one filament lamp with another of higher wattage. When it comes to providing better lighting in the showroom, the problem can not be disposed of so easily. Something more



than more light is needed if the radio dealer is fully to utilize the force of modern lighting for modern merchandising.

Selection of Fixtures

It is an axiom of commercial illumination that different amounts and kinds of lighting are required for different merchandising jobs.

If the radio service dealer will have a look at some of these different jobs, he will be better qualified to deal with his problem of relighting. Because every business has varied requirements, every interior different dimensions, and every dealer individual problems, only a few specific sales benefits of modern lighting, possible in any type of store, will be discussed in this article.

Modern lighting can be used to attract customer attention to window displays, invite them to enter, and focus their attention on featured merchandise. Modern lighting is an important factor in creating the kind of interior atmosphere that is conducive to buying. In another of its important functions, modern lighting will speed buying as it makes possible easier identification and instant appraisal.

The radio dealer can well afford to give careful attention to the lighting of his front and windows. Large groups of potential customers are constantly passing his store. At an average walking rate, it has been estimated that people walk past an average 6-foot window in three seconds. The store front, the window display and the lighting must combine to do a quick job of attraction to catch and hold the attention of possible customers. No ordinary window dressing with prewar lighting will suffice to do a satisfactory three-second job of stopping a profitable percentage of passersby. An effective combination of light sources, fluorescent for diffused brightness, and filament spotlights for color and punch, is recommended for effective window attraction.

Luminous sign and front lighting blend with window illumination to

The general overall lighting sets the tone and establishes the atmosphere of a shop or store. In the radio and appliance interior, (left), high levels of fluorescent illumination reflected from white display units contribute to pleasing atmosphere. Contrast this with illustration on right. Here the booth interiors get most light.

broadcast an invitation to stop and shop. Tomorrow's light-conscious radio service dealer will face the street with a good front, a bright and distinctively lighted front, that welcomes old friends and creates new ones.

Whether the character of his business makes possible an elaborate showroom, or only a few carefully-planned displays in limited quarters, modern lighting also has an important inside job to do for every radio dealer.

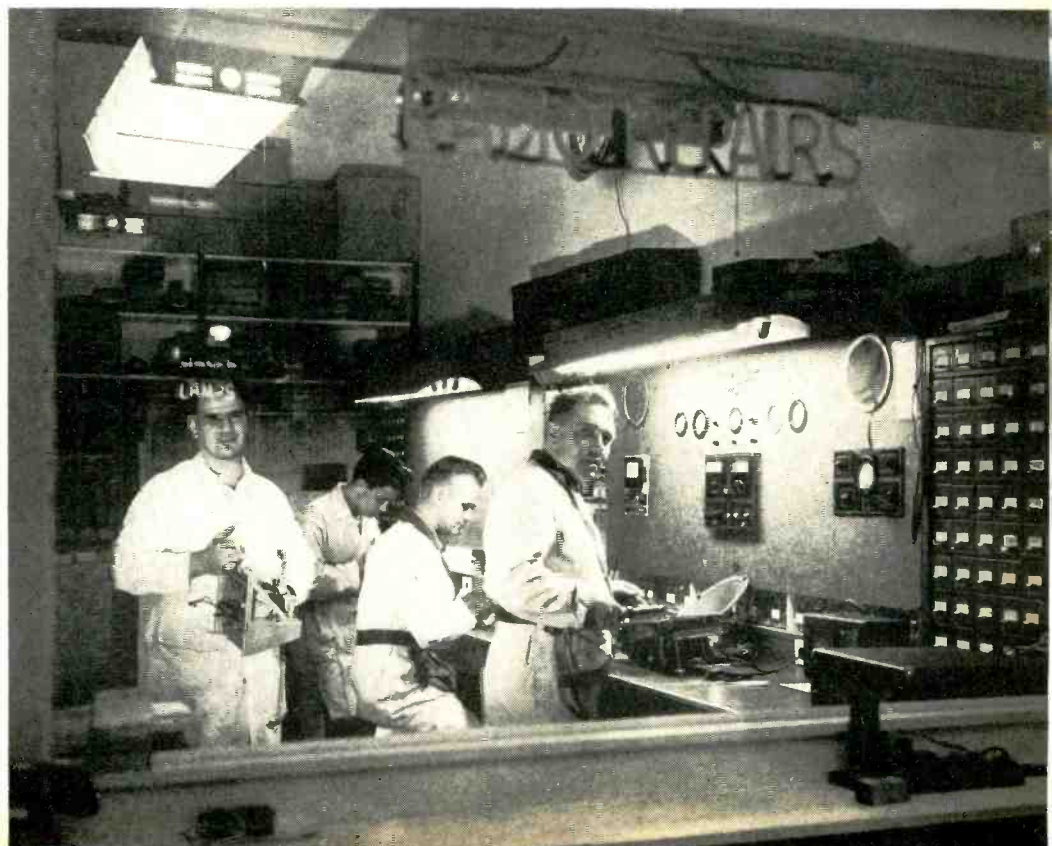
New radio consoles, table models, portables or phonograph-combinations, will attract some attention because of their newness. They will attract much more attention, if dramatic display lighting of correct levels is arranged to highlight their beauty of finish and de-

sign. Whether shown on shelves or counters, in wall niches or show cases or island displays, merchandising specialists commend that featured merchandise should be lighted with *double* the intensities of its surroundings.

Many of the new fluorescent fixtures will have built-in filament directional spots which focus emphatic display lighting on featured items. Other fluorescent luminaires will employ the new circline fluorescent lamps, and rings of light will be used in concentric circles to concentrate higher lighting intensities over special displays, to add decoration to store atmosphere.

All interior appointment, floor coverings, walls and ceilings, furnishings
[see page 79]

The service department of the Park Presidio shows how proper illumination adds to a store's attractiveness and efficiency.



ample, provision should be made under the expenses of the business for those items which, when totaled up at the end of a year can, without further reclassification, be used directly in the return. Such items as interest on business indebtedness, taxes on business property and business losses arising from the business, bad debts from sales or the materials of service, etc. The same is true for the personal deductions which include contributions, interest, taxes, etc. Such planning in advance will make the preparation of your returns a very simple matter, and if you need to employ help in the preparation of these returns, you will save money in their preparation because the material will be readily at hand.

It is recommended that whenever possible the employment of an accountant to install and to check your system is advisable. But an accountant, like other professional men, serves you best when you have defined your problems in such a way that he knows what things you are interested in knowing. It is the aim of this article to help you find those objectives.

10 POINTS ON KEEPING BOOKS

It is necessary to keep the following points in mind in setting up your system of books and posting your ledgers:

1. Every time a debit entry is made, a credit entry of equal amount should also be made.

2. The total of the debit column and the total of the credit column should always be equal.

3. The total of the debit page of the cash book is posted in the debit side of the cash account in the ledger. The individual entries on the debit page are posted directly in the *credit* side of their respective accounts. The credit side of the cash book is posted as a single item to the credit side of the account with cash, while the other individual entries on the credit page are posted in the *debit* side of their respective accounts.

4. Debit an account when an asset comes into the business, and credit the account when an asset goes out of the business.

5. Credit a "force", such as interest income, which brings an asset into the business; we debit

the force account which takes an asset out of the business.

6. The books should be closed at regular intervals, at least once a year.

7. Real accounts are not closed out at the end of the year, but all force accounts must be closed out.

8. To close a force account at the end of the year, add enough to either the debit or credit side, whichever is the smaller, to make the two sides equal. If it is necessary to add to the debit side, make a journal entry debiting the force account and crediting profit and loss. When the credit side of the force account is the smaller, debit Profit and Loss and credit the force account.

9. At the end of the year all force accounts are closed out to a Profit and Loss account, and the Profit and Loss account itself is then closed out to either the surplus or the ownership accounts.

10. When the debits and credits in a ledger account are equal, you need pay no more attention to that account. It is said to be closed.

SUCCESS — built on good

NOW in its fourteenth year of business, Reliable Radio Inc., of Erie, Pa., last spring moved from the west side of the city into large, modernized rooms in the heart of the city's business district. And they didn't stop growing. In the spring of '46 they expect to push their present walls further back!

This concern built its initial success on the slogan "There is no radio that cannot be restored to perfect working order—that we guarantee!" and they have been swamped with radio and appliance repair work ever since.

Naturally, its long range success has included other factors, such as good appliance and radio retailing, which we will note later.

The co-managers, Messrs. Allan R. Davidson, Harold A. Peterson and, recently added, Daniel T. Ryan, boast more versatility than any similar shop in the area. On their ability to service practically anything electrical, from home radios to large pieces of industrial equipment, these men have brought to their doors a steadily increasing number of customers.

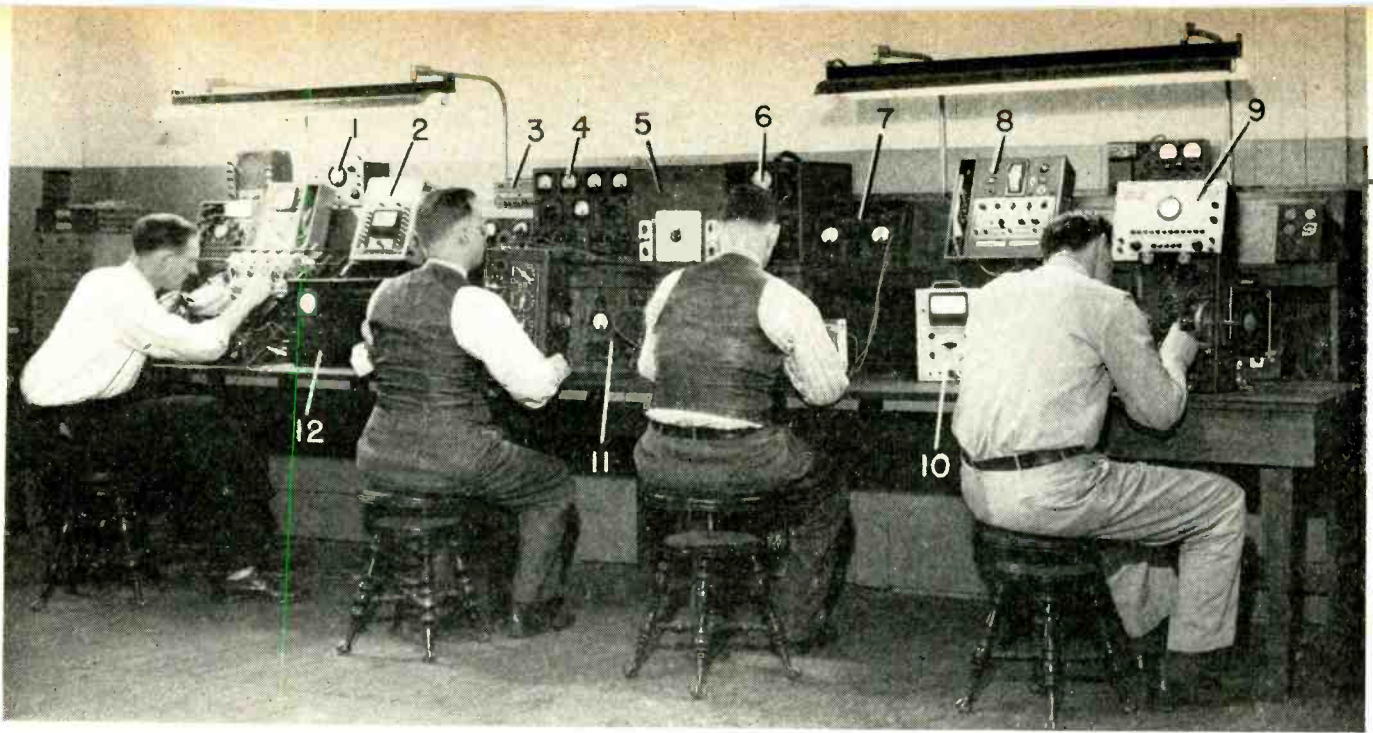
Postwar action by these aggressive

men included the taking up of numerous franchises and planning for a large turnover of radios and a wide range of appliances.

Industrial Servicing

A constant effort to better customer service is well illustrated by Reliable Radio's handling of the following situation: it stemmed from the concern's regular service calls at the Erie Plastic Co., using many heavy electrical pieces of machinery and some electronic controls. Erie Plastic had an urgent safety problem . . .





Herplink, Davidson, Peterson and Zacheroff working at the model bench described below.

1. Impedance Bridge. Takes guesswork out of checking troublesome transformers and speakers.
2. Extra Sensitive Multi-Tester. This meter tests accurately the operating voltages and currents in sensitive radio circuits.
3. Push Button Oscillator for adjustment of push button radios.
4. Traceometer—a costly and important piece of equipment for measuring radio frequency voltages or inserting circuits to test any part of a radio. Here the sensitivity of a radio is checked with the factory specifications to assure proper performance and sensitivity.
5. Condenser and Resistance Bridge for accurate measurements of the component parts.
6. Cathode Ray Oscillograph with built-in frequency modulator. This instrument is the same type that is used in the factory and is the most accurate instrument for alignment once the exact frequency is determined.
7. Multi-Tester for general work.
8. Mutual Conductance Tube Checker. Precision tests with this instrument lay the background for perfect workmanship.
9. Multi-Tester for general work where meter current won't effect readings.
10. Electronic Vacuum Tube Voltmeter. Draws no current and is used to accurately measure circuit voltages in sensitive circuits where meter current would damage part or cause false readings.
11. Controllable Voltage Output to simulate the voltage conditions of any part of the country. Sometimes a radio will work on city voltage but will not work in rural areas. This test saves time and trouble.
12. Cathode Ray Oscilloscope for wave form analization, distortion tests used in the field for testing. Novachords, electronically controlled welders.

retailing, wide service range

A powerful injection molding machine had been known to have closed its steel die jaws on the hands of several workers, causing serious disability and a general fear of the machine. Could a fool-proof safety switch be made which would always fling open these dangerous jaws when any part of a worker's body intruded a specific "danger" area?

Reliable Radio thought it could be done.

Experimentation eliminated the possibility of using the electric eye. Dust and vibration and the wideness of the danger field were factors against it.

Finally Davidson and Peterson hit upon the idea of setting up an electronic control device which created a "power field" in front of the machine that could not be entered without causing the machine's jaws to open. The equipment was tried, perfected and installed.

The success of the invention, which promises wide application in many commercial fields according to the Reliable men, is attested to by the fact that today a slight girl fearlessly operates the heavy equipment.

The safety device is even designed to "fail safe!" Should it break down and

cease operating, the jaws of the molder immediately fly apart.

Very few manufacturing or business establishments in industrial Erie have not been serviced by Reliable Radio men.

The store's service truck makes regular calls at many establishments to service electronic controls, Sciaky welding machines, inter-office communication sets, electric furnaes, electric musical instruments, radio sets and electrical devices of many descriptions.

Davidson, a registered airplane pilot and owner of his own small plane, even flew on one emergency service call to repair an electric organ in an amusement spot over 50 miles from Erie! That was at the Beacon, near Meadville, Pa. Again, Davidson and Peterson both winged to Ripley, N. Y., to work on a defective Magnavox in a private home.

Store Layout

Returning to the modernized Reliable showroom and workshop and future plans: the present rooms and layouts are efficient and bright, the

work of the co-managers. Customer convenience is the keynote.

The showroom floor is covered with serviceable linoleum of a simple modernistic design and the main service counter runs invitingly, with a slight dip, from one side of the store almost to the opposite wall.

This counter was jogged purposely to allow room at the closed side for a quick-test service bench. Sets brought in to be checked in a hurry, along with an estimation of repair or parts replacement charges, are promptly handled here.

Another very practical business aid developed by these men is a neat and comprehensive tag system. See Fig. 1.

Called a "repair order," the tag includes space for customer and repair data, and through individual slips of carbon paper stapled inside the tags, a copy of the initial data is made on the cardboard backing of the tag which goes to the serviceman who eventually is handed the job.

Thus the office girl is able to retain a permanent record of any transaction, readily accessible for inquiring customers through her files. The workman jots on the tag remaining with the work just which parts were serviced or

replaced, their cost and the amount of time spent on the job.

If desired, then, the customer may see exactly how his bill was computed and he feels that he is being treated in a business-like manner.

Reliable Radio, Inc., has two large show windows in which to push merchandising of appliances and floor space enough for the creation of appliance islands. In the future plans, mentioned earlier in this article, almost twice the floor space presently open to customers will be available, with a consequent doubling of merchandise display and selling room.

The store's work benches, presently located at the rear of the rooms, will be housed behind a sound-proof wall in the future setup, eliminating the noise attendant on repair work and making for increased customer comfort in a more relaxed atmosphere.

At present, a partition splits the store's overall area. On the back of this partition are housed tubes and accessories of all kinds. And between the partition and the work benches is storage area for sets in repair or other items to be serviced.

Reliable's service, which is illustrated, is a model of what every store owner or manager strives for in efficiency and profitable repair business. It contains numerous handy electrical outlets, the latest hand tools, odds and ends of repairing necessities, etc., and is big enough to permit four men to work with plenty of elbow room.

Some of the bench equipment is the product of the ingenuity of the co-managers and serves in a capacity not frequently found in the majority of radio service dealer organizations. The fluorescent lighting fixtures used over the work benches were chosen for their efficiency and low cost of operation. When the store is remodeled in the spring of '46, Reliable will probably install this type of illumination throughout.

Reliable advertises in both of Erie's daily newspapers, at intervals, and has tried radio advertising over local stations on a smaller scale. Davidson believes radio advertising demands broadcasting from a station which holds local interest most of the time.

Reliable will sell Stewart-Warner receivers; Frigidaire stoves and refrigerators, hot water heaters, frozen food storage cabinets; Jamaica electric (small) heaters; Sperti irradiation lamps; Scott radios and record players; Blackstone washers; Duotone phonograph needles; Underwood flashlight batteries; Stromberg-Carlson public address systems; General Electric light bulbs; Miracle small appli-

No. _____

POST-WAR RADIO AND ELECTRIC APPLIANCE SURVEY

Through this survey, peacetime production and jobs for returning servicemen can be planned so that you can get the appliances you need as soon as possible . . .

**THIS IS NOT AN ORDER!
PAY NO MONEY NOW!
THERE IS NO OBLIGATION!**

DATE _____

NAME _____ PHONE No. _____

STREET _____

CITY _____ STATE _____

The person whose name appears above has indicated interest in the purchase of articles checked below when such merchandise is available.

<h3 style="text-align: center;">STEWART-WARNER RADIOS</h3> <p style="text-align: center;">APPROXIMATE PRICE</p> <p><input type="checkbox"/> Table Model _____</p> <p><input type="checkbox"/> Console Model _____</p> <p><input type="checkbox"/> Table Combination _____</p> <p><input type="checkbox"/> Console Combination _____</p> <p><input type="checkbox"/> Portable Batt. Model _____</p> <p><input type="checkbox"/> Battery Farm Model _____</p>	<h3 style="text-align: center;">ELECTRICAL APPLIANCES</h3> <p style="text-align: center;">APPROXIMATE PRICE</p> <p><input type="checkbox"/> Washing Machine _____</p> <p><input type="checkbox"/> Ironer _____</p> <p><input type="checkbox"/> Vacuum Cleaner _____</p> <p><input type="checkbox"/> Refrigerator _____</p> <p><input type="checkbox"/> Electric Iron _____</p> <p><input type="checkbox"/> Range Electric Gas _____</p>
---	--

Remarks _____

DEALER'S NAME _____ City _____ State _____

Address _____

YOUR NEW STEWART-WARNER RADIO WILL HAVE . . .

- NEW, EYE-APPEALING CABINET DESIGNS
- KEENER SELECTIVITY AND SENSITIVITY
- FULL-COLOR TONE—TRUE SOUND PERFECTION
- THE SAME ENGINEERING SKILL AND QUALITY MATERIALS AS BUILT INTO WAR-TIME RADIO-RADAR SETS

FOR THE FINEST IN RADIO . . . LOOK TO STEWART-WARNER

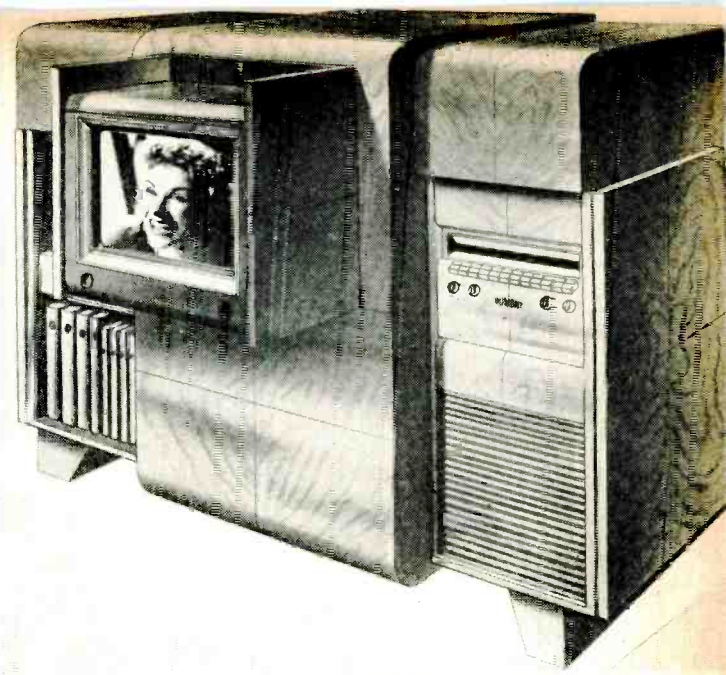
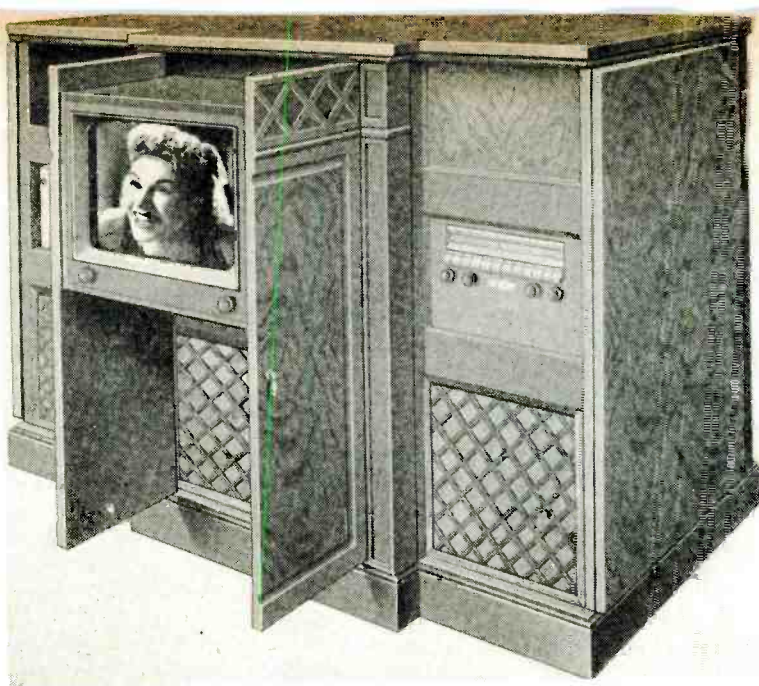
To line up potential radio and appliance customers, this type of manufacturer-supplied "survey" form was used with success

Fig. 1—the job tag and its reverse side billing analysis leads to keeping customers happy

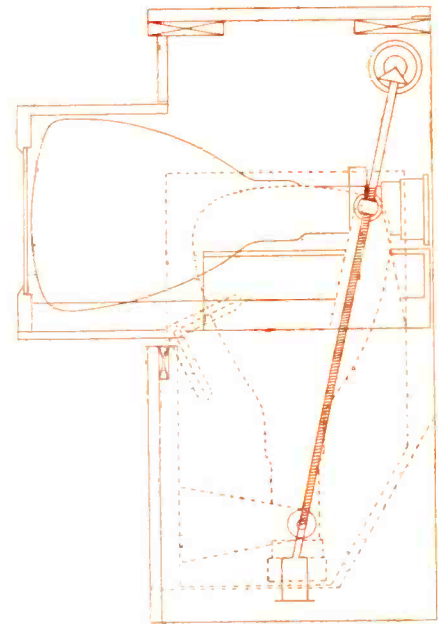
ances, such as flat irons, mixers, vacuum sweepers, and tubes and radio parts of a wide assortment.

Recently all prospects in the territory were surveyed by means of a questionnaire form (shown in connection with this article) to ascertain what the sales potential appeared to be at the time. Of course, the data obtained will result in increased sales of radios and appliances because knowing what your prospects want to buy greatly simplifies a dealer's job of consummating sales.

You can readily see that these fellows are going to be "on the ball" in the vast imminent radio-appliance market visualized by so many. Their energy along these lines, along with up-to-minute shop service, will swell the past success record of Reliable Radio, Inc.



MERCHANDISE PRE-VIEWS - 6.



Several new model Telesets are announced by Allen B. DuMont Laboratories, Inc. The line is rather unusual in several respects because the manufacturer stresses quality, utility and dependability rather than extremely low prices.

Modern and Classic style cabinets are used in the direct-view type DuMont receivers while an ultra-modern design is employed in the Projector model.

The Classic style Teleset will readily adapt itself to the majority of home decoration schemes. Overall dimensions are 60 x 48 x 24 inches. When the cabinet doors are closed the television screen "disappears". A schematic drawing herewith shows how this is achieved. The television screen itself is a 20-inch cathode-ray tube that offers a direct-view picture 18 inches wide by 13½ inches deep. It is said the picture intensity is so brilliant that complete darkening of the room is not necessary in order to view a telecast during daylight hours.

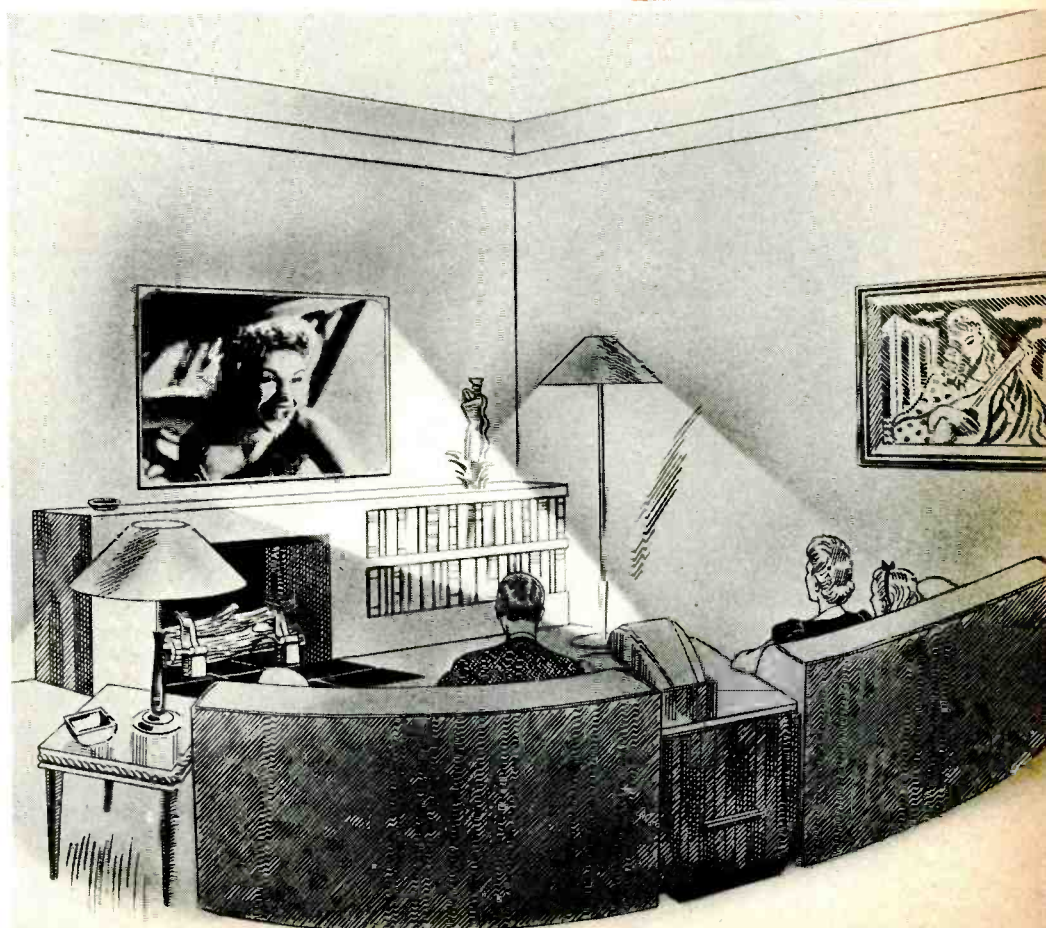
The mechanism that makes the television screen disappear aids primarily in helping to reduce the size of the console. Push-button controls automatically open the front door of the cabinet and tilt the tube downward from a vertical to horizontal position. Having viewed the program, a touch on the push-button returns the tube to its concealed position.

The receiver itself covers both standard and FM bands. There is a phonograph and ample record album

space. Tuning is by both push-buttons and manual dial control. The Teleset is said to be priced at "about \$1500."

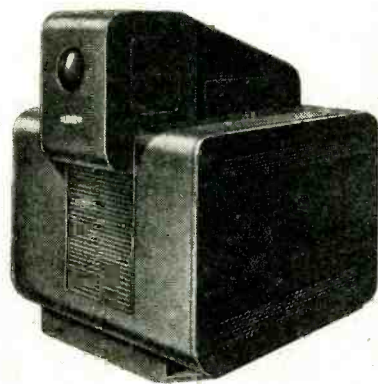
A companion to the Classic model is the Modern Style which has all of the technical features heretofore described and merely differs in cabinet styling.

DuMont scores with the Teletheatre Projection model which is said to be



equally adaptable for deluxe home projection or for use in auditoria, schools, theatre lobbies, hospital wards or where a rather large viewing audience is to be accommodated, or where a very large televised image is desired.

The Projection model is housed in an ultra-modern cabinet, includes FM reception. It will throw a television picture as large as 4½ by 6 feet down to views 3 by 4 feet onto a viewing screen. A seven inch cathode ray tube and optical enlarging system is used. In homes or theatre lobbies the set, because of its stepped design, may be used to serve as end-tables. It is estimated the selling price "approximates \$1800."



The Projection Model

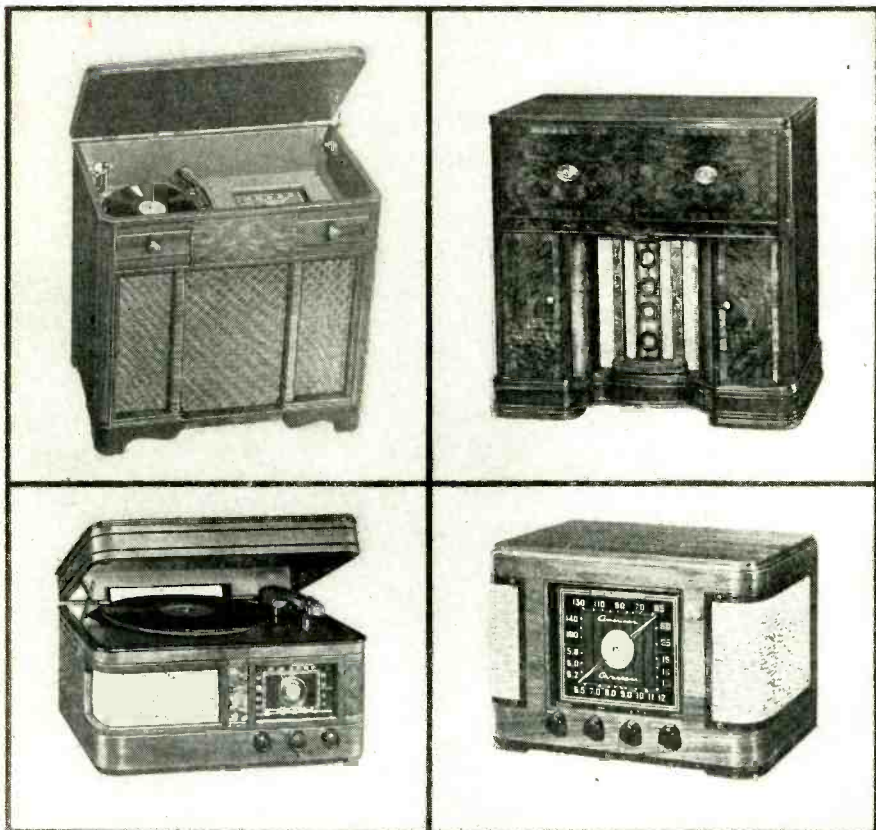
MERCHANDISE PRE-VIEWS - 7.

Nineteen different Crosley models are included in the 1945-46 line being revealed through distributors.

The outstanding features of the new Crosley radios are in no sense experi-

mental. They have been thoroughly tested and approved.

First in importance among the features in the new Crosley radios is the patented "Floating Jewel" tone sys-



Shown here, *top right*, is the Crosley DeLuxe radio-phonograph combination model 106-CR. It has 6 tubes, plays 10" or 12" records. The Seeburg "Single-Control" changer automatically stops after last record is finished. Three bands are covered. Tuning is manual or by 6 push-buttons. Ten tubes provide 12-watts output through 12" electro-dynamic speaker. *Top left* is the model 66CP radio-phono combination, a 6-tube model covering 6 bands, having a 10" speaker. *Bottom left* is the model 56TP radio-phono combination with manual record player. Covering 2 bands, 5 tubes are used; also a PM type speaker. *Bottom right* is the Farm Battery table model 56FB which uses a standard 500 hour 1½-volt-90 volt power pack. 2 bands are covered.

tem, improved and refined since its original introduction in the last Crosley sets made pre-war.

The "Floating Jewel" is a permanent sapphire stylus on a delicately-balanced tone arm which glides gently on the sides of the sound groove on the record, instead of digging into the bottom of the groove. This makes possible improved tone reproduction and longer record life.

Flexible interpretation of radio reception is provided by the Crosley Master Tone Control, through which the radio listener can obtain, instantly, his choice of 64 different tone combinations.

Built-in signal web antennae, continuous tone control and world-wide reception on three broadcast bands are features of the new Crosley sets.

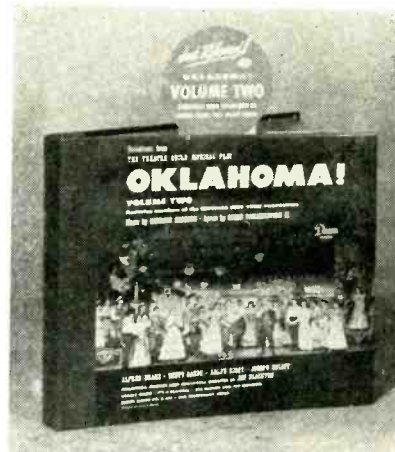
In the 1945-46 Crosley line there are eight table models, two of which are radio-phonograph combinations. One of the sets has an automatic record changer; the other has a manual record player.

Seven console receivers are included in the group. Of these, five are radio-phonograph combinations, ranging from six to ten tubes.

Four farm battery sets complete the group of new models.

Giant circle, full-view dials characterize the new Crosley receivers. All of the new sets have both American broadcast and overseas short-wave bands, while four have three bands, the third being for police calls.

**NEW
RECORD
MERCHANTISER**



Decca has brought out a second installment of the "Oklahoma" hit album. To help distinguish this issue from its predecessor, eye-appealing stoppers, printed in red and white, announcing "Just Released, Volume Two", are supplied in the first envelope of each album. With this second album and the original one, one may now enjoy the entire score of the smash musical comedy hit.

Time Table for Dealer Lines

PRODUCTION SCHEDULE

Appliance	Number of Models	First Models
Refrigerator	3	In production
Home Freezer	1	Indefinite
Range	3	September
Water Heater	6	September
Washer	1	September
Dryer	1	1st quarter, '46
Flatplane Ironer	1	4th quarter, '45
Rotary Ironer	2	September
Dishwasher	3	4th quarter, '45
Disposal	1	1st quarter, '46
Storage Cabinet	Complete Line	Indefinite
Iron	4	In production
Mixer	1	4th quarter, '45
Toaster	2	4th quarter, '45
Roaster	1	4th quarter, '45
Coffee Maker	4	4th quarter, '45
Waffle Iron	3	4th quarter, '45
Grill	2	4th quarter, '45
Portable Heater	2	In production
Heating Pad	3	September
Heat Lamp	1	September
Fan	1	3rd quarter, '45
Clock	3	In production
Automatic Blanket	1	September
Cleaner	4	4th quarter, '45

The General Electric Company announces the electrical appliances it will offer the public in the months immediately ahead. With five exceptions, all models are basically the same as those it sold just before the war. The household electrical appliance line is complete except for sunlamps. The number of models available in each line, however, is generally limited.

For instance, G. E. will produce only one style of washer, three refrigerators, three ranges, three ironers, one roaster. The water heater line is most complete, with six models. Production of four types of appliances — electric clocks, irons, portable heaters and refrigerators — is already under way, and manufacture of a number of other appliances is expected to start within the next few weeks. "But this does not mean that all models of all appliances are in the works," Pritchard said. "For example, we are now producing two automatic irons. A light traveling iron and our steam iron will go into production about January."

Pritchard emphasized that even present production schedules are subject to change. Availability of materials, factory space, machine tools and fixtures and labor are the determining factors. According to Pritchard, the new G-E appliances will be as convenient, efficient and sturdy as the best pre-war models.

of the new refrigerator regulation. Several manufacturers have already filed, and where increases are shown to be required, orders granting them will be issued immediately.

DISTRIBUTORS — margins will be reduced slightly over one percentage point as compared with "initial margins" (those included in the original asking price) on record in March 1942, but should yield returns at least as high as those realized in 1941.

DEALERS — dollar-and-cent prices listed in the regulation or to be added later. These allow a margin in each case less than recorded in 1941 initial margins by slightly over one percentage point. Here, also, there will be no actual reduction, dollar-wise or percentage-wise, in 1941 realized margins, since dealers will not find it necessary to accept trade-ins at above their resale value, or hold special sales in order to stimulate consumer buying.

Westinghouse Is Optimistic About Sales Potential

A POSTWAR market for 60,000,000 home radio receivers — enough to keep the industry at peak production for six years—is anticipated by the Westinghouse Electric and Manufacturing Company, according to the recently issued Stockholders' Quarterly Report. Reviewing an extensive survey which influenced the company in its recent decision to re-enter the home radio field with a complete line of home radio and television receivers as soon as materials and manpower are available, the Quarterly lists these five factors expected to affect strongly the postwar market for radio dealers:

1. Frequency Modulation radio will hasten total replacements by outmoding practically all sets now in use.
2. The demand for radio-phonographs will increase the size of the market by increasing the average sale.
3. Returning servicemen, establishing new homes, will represent a huge new market.
4. The surface has only been scratched in the market for extra sets to provide listening convenience throughout the home.
5. A steady growth in television is anticipated.

New Refrigerator Prices

Manufacturers will tag all units with the retail ceiling price, both as a service to retailers and as an aid in the enforcement of the new ceiling prices. — MPR 598

CEILINGS for new household refrigerators have been established at levels that will maintain, on the average, March 1942 prices to consumers. In a new regulation governing prices of "reconversion" refrigerators (those manufactured after July 1, 1945) at all levels of sale, OPA set the following ceiling prices:

MANUFACTURERS — ceiling prices in effect on March 30, 1942, for the same or closely similar models, if these are higher than prices as computed under the individual reconversion pricing formula included in the regulation. Otherwise, each firm is eligible for an individual adjustment over its

October 1941 prices to reflect legal increases in materials prices and basic wage rate schedules for factory workers. The allowance for profit will be either its own 1936-39 average, or half the industry average, whichever is greater.

In order to make use of the individual adjustment provisions of the regulation, manufacturers must file applications within the two-week period ending November 10, 1945. Firms entitled to individual adjustments who have not filed by the end of this period may still file under the reconversion pricing order of July 23 the provisions of which are closely similar to those

NEW PRODUCTS

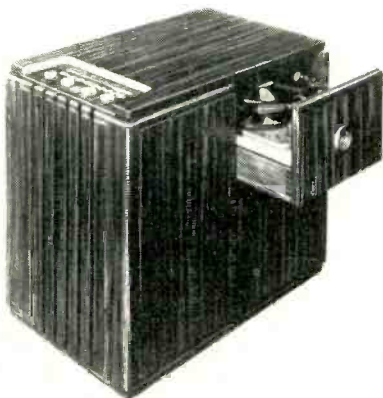
radios



BENDIX, model 676 B, Regency styled knotty pine console. 6-tube super-het. Standard and Police bands, 535-1725 KC. Automatic single-button record changer. Permanent pickup needle. 3 color slide rule dial, PM speaker. Bendix Radio Div., Towson, Md.



MOTOROLA, model 75T31, F-M A-M Table Radio. Walnut veneer cabinet. 7 tubes including rectifier. 6 push buttons. 3 bands — F-M, Standard Broadcast and Short Wave. Electrodynamic speaker. Built-in antenna. Galvin Mfg. Corp., 4545 W. Augusta Blvd., Chicago, Ill.



ECA, model 121, 7-tube chairside radio record-changer combination. Phonograph slides either side. Handles 10 and 12 in. records. Has album compartment. Light weight crystal pickup. Cabinets in mahogany, bleached mahogany and walnut. 8" alnico V speaker. Tuning range 540-1700 KC. Slide rule illuminated dial. Di-fusa-tone grill. Electronic Corp. of America, 45 W. 18th St., New York 11, N. Y.



WESTINGHOUSE, "Symphonic 14" model. Chippendale radio automatic photograph combination, AM-FM. Westinghouse Elec. Corp., Sunbury, Pa.



GAROD, model 8APX2 "Chippendale" inspired two-tone walnut cabinet houses a deluxe automatic radio phonograph combination. Employs 8 multi-purpose tubes for foreign, domestic, and short wave reception. Two-post record changer accommodating twelve 10" or ten 12" discs is counted in "Hide-a-Way" drawer. Record compartments are behind two lower doors. 12" high fidelity "Cathedral" speaker. Garod Radio Corp., 70 Washington St., Brooklyn 1, N. Y.



AUTOMATIC, "Tom Thumb" model. 5-tube ac-dc phonograph radio. Plays 10"-12" records. Self-starting motor, crystal pickup, dynamic PM speaker. Automatic Radio Mfg. Co., 122 Brookline Ave., Boston, Mass.



BENDIX, model 526-B, plastic table radio, 5-tube ac-dc super-het. Standard and Police bands, 535-1725 KC. PM speaker, AVC, built-in antenna and concealed carrying handle. Bendix Radio Div., Towson, Md.



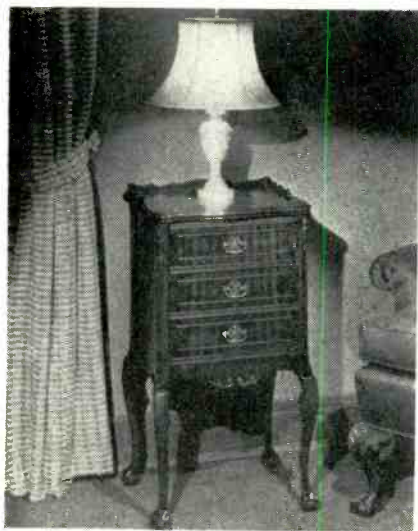
MOTOROLA, model 65F21, 6-tube Lowboy automatic phonograph radio. 2 bands. Full vision illuminated slide rule dial. Built-in loop. Galvin Mfg. Corp., 4545 W. Augusta Blvd., Chicago, Ill.



ECA, model 105, 5-tube portable radio-phonograph. Two-tone leatherette cover with carrying handle. 1-watt output. 5" alnico V speaker. Tuning range 540-1700 KC. Slide rule illuminated dial. Di-fusa-tone grill. Built-in loop antenna; tone control; light weight crystal pickup. Electric Corp. of America, 45 W. 18th St., New York 11, N. Y.

radios

NEW PRODUCTS



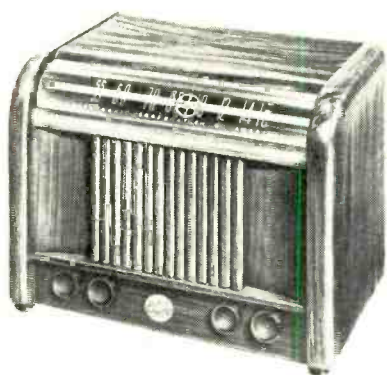
STEWART-WARNER, model 9001-D, 6-tube, 2-band a.c. radio in mahogany Chippendale style commode. Iron-core push-button tuning. Frequency range 540-1725 KC and 9-12 MC. Low impedance loop. Phono jack. Stewart-Warner Corp., 1828 Diversey Pkway, Chicago 14, Ill.



GAROD, model 5D1, 5-tube portable ac-dc, battery radio in leatherette case. Loop antenna built into lid. Carrying handle. Full vision dial. Garod Radio Corp., 70 Washington St., Brooklyn, N. Y.



STEWART-WARNER, model 9004-B, 7-tube, 2-band AC, phonograph-radio combination console. 6 push-buttons, including one for button-to-manual tuning change. Iron-core tuning on frequency ranges 540-1725 KC and 9-12 MC. Tamper-proof record changer. 5000 plays needle on light-weight tone arm. Stewart-Warner Corp., 1828 Diversey Pkway, Chicago 14, Ill.



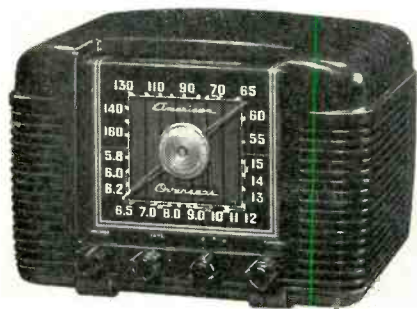
ECA, model 107, 7-tube ac-dc table radio, 2 1/2 watts output. 6" alnico V speaker. Tone control. Full vision illuminated slide-rule dial. Tuning range 540-1700 KC. Di-fusa-tone grill. Built-in loop antenna. Electronic Corp. of America, 45 W. 18th St., New York 11, N. Y.



WESTINGHOUSE, "Duo" model radio record player combination. Receiver portion lifts out of cabinet becoming independent unit. Westinghouse Elec. Corp., Sunbury, Pa.



AUTOMATIC, battery portable, 5-tube ac-dc, PM dynamic speaker, self contained aerial, has battery rejuvenator. Automatic Radio Mfg. Co., 122 Brookline Ave., Boston, Mass.



CROSLY, model 66TA receiver in modern brown bakelite cabinet. Covers Broadcast and foreign bands. 6 tubes afford 4 watts undistorted output. Large dial. Electro-dynamic speaker. Continuous tone control. Signal web antenna built-in. Crosley Corp., Cincinnati 25, Ohio.



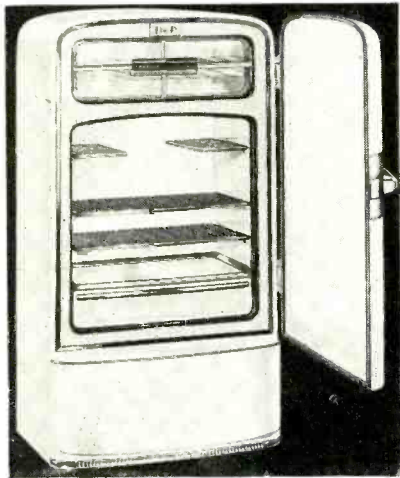
ADMIRAL, 5-tube combination radio record changer. Walnut table model with horizontal clear vision tuning dial. Handles 10 and 12 inch records. Admiral Corporation, 3800 W. Cortland St., Chicago, Ill.



MOTOROLA, model 5A1 "Playboy" battery portable. Uses miniature "Handie Talkie" type tubes. PM speaker. Loop antenna mounted in front cover. Tuning range 550-1600 KC. Automatic switch turns set on when cover is opened. Model 5A5, operates ac-dc and battery. Galvin Mfg. Corp., 4545 W. Augusta Blvd., Chicago, Ill.

NEW PRODUCTS

appliances



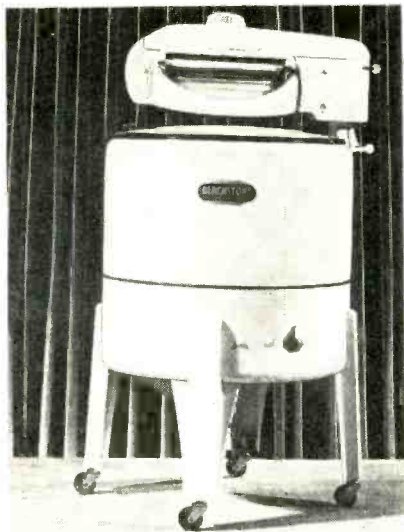
ADMIRAL, Dual-Temp refrigerator with separately insulated 2 cubic feet freezing locker and large moist-cold compartment, with Sterilomp that safeguards food against spoilage. Admiral Corporation, 3800 W. Cortland St., Chicago, Ill.



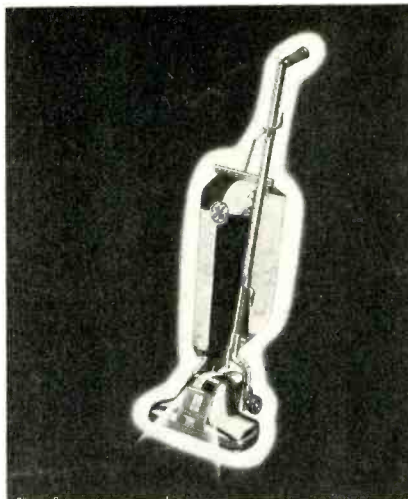
TELECHRON, "Selector" self-starting electric clock, model 8H55. Mahogany plastic case, dial 3 1/4" metal, weighs 3 3/4 lbs. complete. Clock may be preset to automatically turn on and off radio programs when connected to set. Or, may be connected to start coffee pot or roaster. Warren Telechron Co., Ashland, Mass.



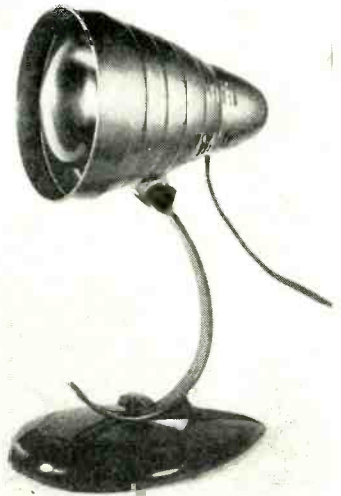
TYLER, Harderfreez upright 18 cu. ft. farm and home locker. Hermetically sealed, rigidly constructed of welded steel inside and out. Tyler Fixture Corp., Nile, Mich.



BLACKSTONE, model 132 wringer washer, 8-pound capacity, family-size tub. Hi-Vane circulator, satin-finished aluminum. Lovell wringer, with "Econo-Gauge" pressure selector. Controls centralized in streamlined wringer head housing. Standard make 1/4 h.p. motor. Blackstone Corp., Jamestown, N. Y. (a division of Jamestown Metal Equipment Co., Inc.)



GENERAL ELECTRIC, model AVF-17s vacuum cleaner with one-speed motor. Available in brown and tan color schemes. Appliance & Merchandise Dept., General Electric Co., Bridgeport, Conn.



GENERAL ELECTRIC, model 1R-4 table infra-red heating lamp. Uses special 250-watt bulb. Metal hood prevents user from burns. Has tilt adjustment. Appliance & Merchandise Dept., General Electric Co., Bridgeport, Conn.



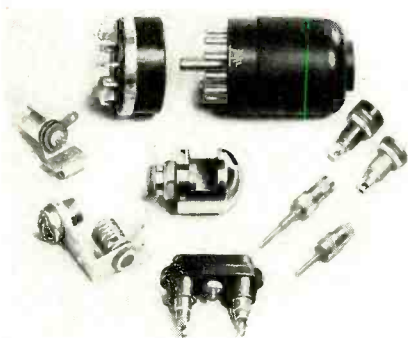
GENERAL ELECTRIC, model Y-199 waffle iron with heat control operated by Textolite knob. Signal light shows when to pour batter and when waffle is done. Bright metal finish. Appliance & Merchandise Dept., General Elec. Co., Bridgeport, Conn.



TONE, "Merry-Go-Round" phonograph with electric amplifier. Designed for use of children. Takes up to 12" records. Carousel is formed of multi-colored nursery and fairy-tale characters painted on and revolves with record while the Calliope houses the speaker. Has single control to operate on-off switch as well as tone volume. Made of steel and wood, rugged to stand children's abuse. Full details from Tone Products Corp. of America, 351 Fourth Ave., New York 10, N. Y.



GENERAL ELECTRIC, model DM-8, automatic portable mixer. Removable beaters, multi-speed motor. Built-in light. Accessories included. Appliance & Merchandise Dept., General Electric Co., Bridgeport, Conn.



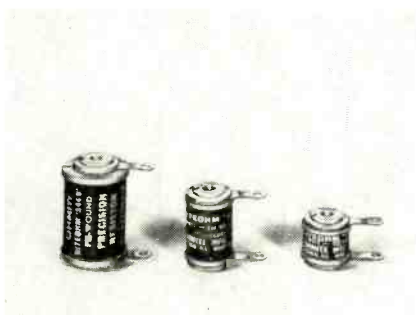
E. F. JOHNSON, the seven and twelve wire cable connectors are polarized and contacts are clearly marked for convenience. These connectors are available with several types of mounts for both the receptacle and pin plugs. Pilot lights are supplied with a variety of jewel colors and jewels may be purchased separately for replacement. Dial lights are supplied as shell assemblies and with slip-on brackets to facilitate speed and ease in installation and bulb replacement. Tip plugs are of the solderless type and are supplied in a long and short length. Tip jacks are available with either metal or bakelite type heads and both are available with round and hexagon heads. The twin jacks are molded bakelite in two types, shorting and non-shorting.



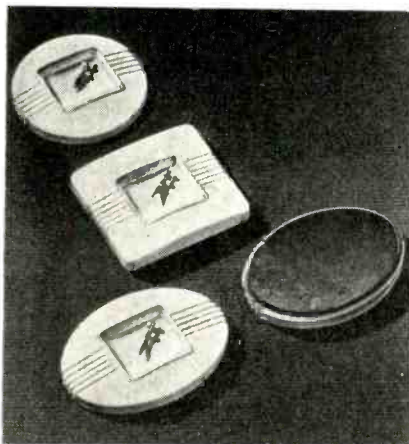
OPERADIO, loudspeaker with pressurized grill, designed expressly for modern, improved railroad communications systems. Affords maximum tone volume and intelligibility. Speaker housing completely sealed and weatherproofed. Waterproof terminal cover permits external connection without opening unit. Fittings and mountings standard for railroad equipment. Operadio Mfg. Co., St. Charles, Ill.



PORTA-POWER, model H, permits 4 to 6 tube operate off 105-125v, 50-60 cycle lines. Uses iron core chokes and high capacity condensers. Weighs 4 1/2 lbs. Sies 2 1/8" x 4 1/2" x 3/4". Universal sockets take all battery plugs. General Transformer Corp., 1250 W. Van Buren St., Chicago 7, Ill.



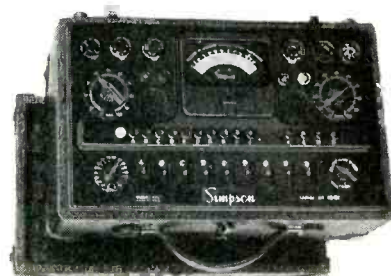
RITEOHM, precision resistors — types 844B, 844A, and 842A; mount by means of a through-bolt, radial lug at ends. Minimum resistance 1.0 ohm for 2-pie unit and small 4-pie unit; .10 ohm for large 4-pie unit. Maximum resistance; 200,000 ohms for 2-pie; 400,000 ohms for small 4-pie; 1.5 megohms for large 4-pie unit. For more data ask for Bulletin #126, Ohmite Mfg. Co., 4835 Flournoy St., Chicago 44, Ill.



GAROD, Permatone needles, 3 new types merchandised on 4-color display cards, with needles housed in transparent lucite-window cases. Needles are surface-tempered, of rare alloys, have non-corrosive tips. Garod Radio Corp., 70 Washington St., Brooklyn, N.Y.



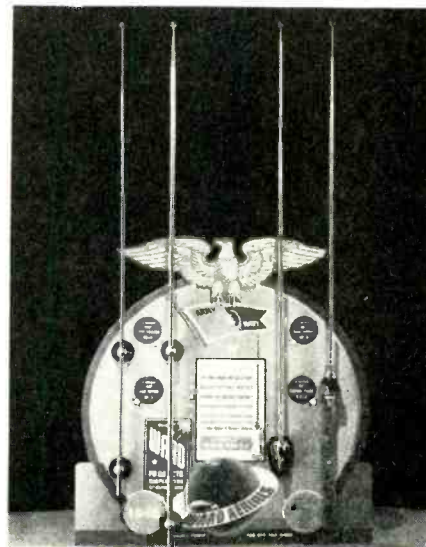
RADIART, type VR-2 midget vibrator measuring 2 1/8" high by 1 1/8" dia. Designed to operate from 6-volt storage battery to furnish power for certain communications equipment. Complete ratings and details available from Radiart Corp., 3571 W. 62nd St., Cleveland 2, Ohio.



SIMPSON, new type Mutual Conductance Tube Tester. 10 push-button and 9 rotating switches of 6 positions provide a multitude of combinations in tube element and circuit selection. Colored zones on dial coincide with the micromho rating indicating whether tube is good, fair or bad. Automatic reset button returns all switches to normal. Case is plywood, fabricoid covered, with leather trimmed corners. Panel in bakelite, satin-grained finish. Cover removable. Overall size 15 1/2 x 9 1/2 x 6 1/2 inches. Simpson Elec. Co., 5216 W. Kinzie St., Chicago 44, Ill.



CLARK, CS-1H Set containing 4 counterbores, an assortment of 11 extra pilots, all in a wood crib. The four tools cut any fractional or decimal diameter within 1/4" to 1 3/8" O.D. Unique cross-rip prevents burrs from forming around the edge of the pilot hole. High speed blades can be easily sharpened or replaced. Rob't H. Clark Co., 9330 Santa Monica Blvd., Beverly Hills, Cal.



WARD, store display featuring 4 new model auto antennas which incorporate Hi-Q low loss detachable polyethylene lead with silver-to-silver contact; E-Z One Man installation feature and Fluid Type anti-rattle construction. Ward Products Corp., 1523 E. 45th St., Cleveland 3, Ohio.

IN June, 1945, during the period between V-E Day and V-J Day, on behalf of Sylvania Electric Products, Inc., we set out to find the answers to many questions concerning FM. The Radio Industry must have these answers in order to approach this portion of the radio market with assurance and intelligence.

The answers are presented herewith. As in previous surveys, this study was made by an independent research organization of national reputation. Close attention was paid to making the sample a true cross-section from every important standpoint.

During the next two or three years, FM set production may add a new \$600,000,000 market to the radio set business, according to our research findings to ascertain the immediate outlook for FM receiver sales. This means that 10,700,000 FM sets can be sold out of a total market for 17,400,000 sets.

FM set owners today represent less than 2% of all radio set owners. Three out of four FM sets in homes today were purchased in 1941 and 1942. Nine out of ten FM sets now in use are AM-

FM combinations and 85% of their owners have other radios. Of these 73% cost between \$100 and \$399; 15% over \$400; and only 8% less than \$100.

Not only do people definitely want FM receivers but they are willing to pay more for them. We believe that 56% of the prospects are willing to pay \$100 to \$150 more for an FM set with true high fidelity; 27% will pay \$30 to \$50 extra; and only 13% say they don't know how much more they are willing to spend.

Reasons why the majority of FM set owners prefer FM to AM were shown by 85% of those interviewed who said that it reduced static and noise; the 61% who said it gave greater realism; by 37% who reported less interference between stations; and by 20% who said they liked FM programs better. Only 14% said they liked FM best because AM reception was poor in their locality.

The consensus of opinion of FM set owners indicated that they liked them and they use them; they have no serious trouble operating their receivers; and they believe that FM is superior to AM in many respects.

In addition to actual FM set owners many other listeners representing a good sample of the radio audience were interviewed. Of these in this group who had listened to FM programs, 70% said that they preferred FM to AM. Only 21% were unable to distinguish the difference between FM and AM reception. When asked where they had heard FM programs, 68% said that they had heard programs in friends' homes; 19% in retail stores; and slightly less than 10% in broadcasting stations.

One of the FM features that appeals to those who do not have FM receivers is high fidelity. 72% of those interviewed said they think it is a distinct advantage. Only 26% consider it unimportant. However, interviewers of actual FM set owners who watched them tune their receivers observed that only 19% actually took advantage of FM's high fidelity feature. 71% did not and 10% did not know how to tune in programs with high fidelity.

Our survey tends to indicate a tremendous new market for FM receivers. Postwar FM receivers should be available to the public early in 1946.

Public Opinion of FM Sets

by FRANK MANSFIELD*

Information of tremendous value to all Radio Service

Dealers may be gleaned from the findings of this survey

TWO OF THREE POST-WAR RADIO PURCHASERS WANT FM					WHAT QUALITIES DO PROSPECTIVE BUYERS CONSIDER IMPORTANT IN FM?	
Want FM	66.6%				Less Noise or Static	38.3
Don't Want FM	10.2%				Greater Realism	36.0
Don't Know	23.2%				Less Interference	10.1
The Desire Varies With Income					Less Advertising	8.5
Economic Group					All Other	7.1
Want FM	A	B	C	D	HOW MANY PROSPECTIVE PURCHASERS WOULD DEMAND HOME DEMONSTRATION?	
	75.6%	67.8%	63.4%	53.3%	45.4% would be satisfied with a store demonstration.	
And With Geographic Area					54.6% would demand a home demonstration.	
Want FM	North	North	South	West	DO PROSPECTS THINK HIGH FIDELITY WOULD BE A GREAT ADVANTAGE?	
	East	Central	South	West	71.8% Think High Fidelity Advantageous.	
	57.4%	65.7%	87.6%	54.3%	25.8% Say "Not Important".	
Most People Realize FM Will Add to the Cost of a Radio					2.4% Say "Disadvantageous".	
Of those wanting FM, 19.3% have no clear conception of how much extra they expect to pay. Those who have formed an opinion have the following ideas on price:					And They Are Willing to Pay For It.	
Estimated Extra Cost	% of Total				56.2% Would pay \$100-\$150 in addition to Normal AM set cost to get High Fidelity.	
0	2.0				26.6% Would pay \$30-\$50 more for FM Without High Fidelity.	
Less than \$30.00	36.4				12.5% Don't Know.	
\$30-\$50	14.8				4.7% Want Neither.	
\$50-\$75	23.5					
\$75-\$100	8.2					
Over \$100	15.1					
	100.0					

*Director of sales research, Sylvania Electric Products, Inc.

BUYING DETERMINATION STRONG DESPITE "FAULTS"

To test the extent to which prospective purchasers are sold on FM, we suggested certain faults, present in many FM receivers, to see if they would still buy a set, even if these faults existed.

The Set Might Pick Up
Man-Made Static (Automobile Ignition)
39.6% Would Refuse to Buy unless corrected.
50.0% Dislike this characteristic but would buy anyway.
10.4% Think Static Unimportant.

IF AN ANTENNA COST EXTRA TO MAKE FM RECEPTION POSSIBLE

	At \$15-\$20 Extra Cost	At \$30-\$50 Extra Cost
Would Not Buy	18.3%	33.7%
Would Buy Anyway	52.1%	50.7%
Think This Unimportant	29.6%	15.6%

IF FM RECEIVERS DO NOT STAY IN TUNE TO STATIONS

31.1% Would refuse to buy.
57.4% Find this an unpleasant feature—would buy anyway.
11.5% Think this unimportant.

IF FM RECEIVERS GIVE LOUD INTER-STATION NOISES

25.9% would refuse to buy.
57.9% Find this an unpleasant feature—would buy anyway.
16.2% Think this unimportant.

IF FM PROGRAMS WERE QUITE DIFFERENT FROM STANDARD BROADCASTS

19.1% Would refuse to buy.
64.8% Find this an unpleasant feature—would buy anyway.
16.1% Think this unimportant.

WERE FM RECEIVERS NOT TO HAVE PUSH-BUTTON TUNING

9.1% Would refuse to buy.
29.2% Find this feature unpleasant—would buy anyway.
61.7% Think this unimportant.

PEOPLE STILL WANT FM

Even After These Limitations Are Discussed

60.6% Still say they will buy.
13.9% Say they will not buy.
25.5% Don't know.

FM CAN ADD \$600,000,000 TO THE RADIO BUSINESS IN THE

10,700,000 FM Sets Can Be Sold Out of a Total Market of 17,400,000 Sets.

RADIO BUYING HABITS AND PREFERENCES VARY CONSIDERABLY ACCORDING TO ECONOMIC STATUS

For convenience we divide the public into four economic or income groups.

Group	Annual Family Income
A	\$5,000 and over
B	\$3,000—\$5,000
C	\$1,000—\$3,000
D	Under \$1,000

In General, Occupations Determine Economic Status

A—Executive and Professional
B—White collar, highly skilled labor
C—Skilled and semi-skilled labor and average farmer
D—Unskilled labor, tenant farmers

Percentage of All Families by Economic Groups

A—5% B—12% C—45% D—38%

Percentage of Radio Families by Economic Groups

A—6% B—14% C—48% D—32%

HOW MANY FM RECEIVERS ARE NOW IN USE?

Our sample indicates 432,000. At present they are concentrated in the higher income groups in the urban areas.

Economic Status	No. of Urban Radio Families	% With FM	No. of FM Sets in Use
A	1,200,000	7.3	87,000
B	2,800,000	6.3	176,000
C	9,600,000	1.5	144,000
D	6,400,000	.4	25,000
Total	20,000,000	2.2	432,000
Total Families Including Rural	31,000,000	1.4	432,000

(This checks very closely with official and semi-official sources.)

WHEN WERE FM SETS PURCHASED?

Year	%
1939	3.5%
1940	9.2%
1941	55.2%
1942	26.4%
1943	4.6%
1944	1.1%
Total	100.0%

Most of Them Are FM-AM Combinations

FM — AM Combination	93.1%
FM Only	6.9%
Total	100.0%

HOW MUCH DID THESE FM RECEIVERS COST?

Cost	% of Sets
Under \$100	8.3
\$100—\$199	20.8
\$200—\$299	30.9
\$300—\$399	22.2
\$400 and Over	15.3
Built by Owner	2.8
Total	100.0

84.9% of these FM Receiver owners have other radio set in their homes.

Most FM Owners Have an Outside Antenna

Inside	23.3%
Outside	76.7%

And Many Are Special FM Antenna

Type	Cities Large	Communities Smaller	Total
Special FM	19.0%	74.4%	48.7%
Regular Outside	32.3%	21.0%	26.2%
Inside	48.7%	4.6%	25.1%
Total	100.0%	100.0%	100.0%

WHEN A PROGRAM IS AVAILABLE ON BOTH FM AND AM FM OWNERS PREFER FM RECEPTION

Prefer FM	72.1%
Prefer AM	23.2%
No Choice	4.7%
Total	100.0%

And Their Reasons Are

Reason	% of Total
Less Static	75.8
Better Tone	43.5
Less Advertising	4.8
All Others	14.5

(Average of 1.4 Answers per Owner)

But Of All FM Owners	
Listen to FM Most	34%
Listen to AM Most	63%
Listen to Both Equally	2%

(1% of owners claim to listen to neither.)

It should be borne in mind that FM is available for a much shorter period of the day than is AM.

continued on next page

HOW MUCH DO FM OWNERS LISTEN TO THEIR RADIOS?

	Hours per Week	
	FM	AM
Large Cities	9 hrs.	21 hrs.
Smaller Communities	16 hrs.	18 hrs.
Average	13 hrs.	19 hrs.

WHAT DO LISTENERS LIKE ABOUT FM RECEPTION?

	% Giving Reason
Less Static and Noise	84.9
Greater Realism	60.5
Less Advertising	47.7
Less Interference	37.2
Better Programs	19.8
AM Poor in Locality	14.0

WHAT DO LISTENERS DISLIKE ABOUT FM RECEPTION?

Static (From Auto Ignition, etc.)	36.0
Interstation Noise	20.9
Tuning Unstable	17.4
Difficult to Tune	16.3
Requires Outside Antenna	11.6
Lacks Push Buttons	8.1
(Other Volunteered Answers)	
Not Enough Stations	18.6
Not Enough Variety of Programs	11.6
Fading	4.7
All Other Reasons	11.6
No Unfavorable Features	20.9

From These Findings We Conclude That FM Owners:

1. Like FM and use it.
2. Find no serious troubles with FM.
3. Believe it to be superior to AM in many ways.

BUT WHAT ABOUT NON-OWNERS? WHAT DO THEY THINK ABOUT FM?

They Now Constitute 98.6% of All Radio Families. Only One in Seven (13.9%) Has Heard FM. The Rest Base Their Opinions on Hearsay.

Where Have the 13.9% Heard FM?

	% of Total
In home of friends	68.5
In retail stores	18.6
In broadcasting stations	9.3
Other	3.6

Of Those Who HAVE Heard FM

- 70.4% Prefer FM Reception.
- 4.0% Prefer AM Reception.
- 21.2% Couldn't tell difference.
- 4.4% Didn't know or gave qualified answers.

Their reasons for preferring FM followed those of FM Owners very closely.

FM, Television to Revolutionize Radio Service

by HAROLD W. SCHAEFER,

POSTWAR radio service business will offer a challenging combination of expanded opportunities and stern responsibilities.

Surveys indicate that manufacture of civilian radios will not meet demand for the first few postwar years, and that about seven and a half million repair jobs—representing approximately \$55,000,000 worth of service business—will be required to keep the nation's radio sets in operation during the first year alone.

In addition to this maintenance there will be the all-important job of installing new FM and television sets; and it is in these installations, more than in any other postwar activity, that the service man can be of lasting benefit to the radio industry. Such installations, properly made, will contribute much to the general and rapid acceptance of these newer radio developments while unsatisfactory installations will retard acceptance by fostering doubt as to their worth and reliability.

Postwar FM and television will make more exacting demands on both

* Ass't. Mgr., Westinghouse Home Radio Division

Proper installations of FM and television sets will promote rapid acceptance of these newer radio developments. Market growth depends on service methods. \$55,000,000 of immediate servicing business foreseen.

the manufacturers and the service man. Because they operate at much higher frequencies than ordinary radio, the technical problems of each are greatly increased. This is particularly true of television, since the definitions of sight are greater than those of hearing.

Manufacturers will have to use higher quality materials and employ cleaner production techniques if they are to build the kind of receivers required by these scientifically-stepped up services. Service men, on the other hand, will have to keep abreast of improving installation and maintenance methods. This will require additional investments of time and money to acquire the necessary "know how" and equipment. But, despite costlier operation, both will profit because of vastly expanded opportunities.

Strict attention to these installations will save the postwar service man a

great many headaches, and they should be of little trouble even in view of the contemplated shift from the 42-50 megacycle band to the 84-102 mc band. In many locations the set's regularly built-in antenna will provide excellent reception. However, in less favorable places it will be necessary to go to outside dipole antennas and, in particularly unfavorable spots, to beam antennas.

Antenna Key to Good Reception

Important as they are to FM, antenna installations are even more important to television if reception is to be at its best. Every television receiver must have a good antenna system. Often this will require special filters to eliminate electrical interference, or particular placement to cut down deflections. In the past, because of the

[see page 51]



Left, owner Fultz; right, service manager Daugherty. Sign over owner is prewar, reads, "Authorized Dealer, Farnsworth . . ."

Service Bench Into Department

Service department with manager frees owner for sales.

by M. E. MACDONALD

EFFICIENT servicing is building a reputation for Columbia Clinic located at 2414-14th Street, N. W., Washington, D. C. Its owner, Ed Fultz, finds that factory training does the trick. He is rapidly laying the cornerstone for a solid volume of new product sales.

One year ago young Fultz—upon his release from the Navy, decided to achieve his goal—to go into business for himself. Washington spelled the success location; and the district which was growing steadily seemed to be 14th Street. He decided his stepping stone to successful retailing should be courtesy and "super" servicing.

Today if you visit this up-to-date establishment and see his influx of

customers you will see that the policy formulated a year ago has been strictly adhered to. His service bench occupies stage center of the shop. Bright color and lighting, and the absence of clutter, makes the shop outstanding. Owner and employees are neat, and courteous attention to customers is fast writing that prospect list for tomorrow.

Having specialized in servicing at the Zenith factory in Chicago, Fultz believes in having a servicing department headed by experts. "Training is a time-saver and certainly a good-will builder. Ability to explain the job to the customer creates confidence. Training shortens the time per job, curtails overhead and dramatizes the well-equipped service bench," he declares.

Everyone wants his radio repaired in a hurry—yet this trained specialist contends speed must not retard efficiency. "Efficient servicing will build profits for tomorrow," he contends. With the coming of V Day the service bench is being expanded into a department, under the expert management of Tom Daugherty, service specialist.

Electric organ repairing is a "major" sideline. Columbia Clinic is already handling the repair of Hammond organs and this service man is slowly yet steadily gaining a city-wide reputation for super servicing.

Tomorrow's blueprint, aside from expanded servicing, carries a highly efficient sales department. All standard makes of radios as well as appliances and television will be promoted. Ed Fultz is a television enthusiast. He sees its revolutionary bearing on business, and is convinced it will have a greater effect upon radio promotion than the talkies had on movies.

HOW TO CHOOSE

by ARTHUR LIEBSCHER

JUDGING from present indications, the market for electronic equipment of all sorts is expected to increase tremendously within the next few years, and to expand in variety and applications to a degree far beyond prewar limits. With this increase in volume and kind, test equipment for its production and maintenance must keep pace.

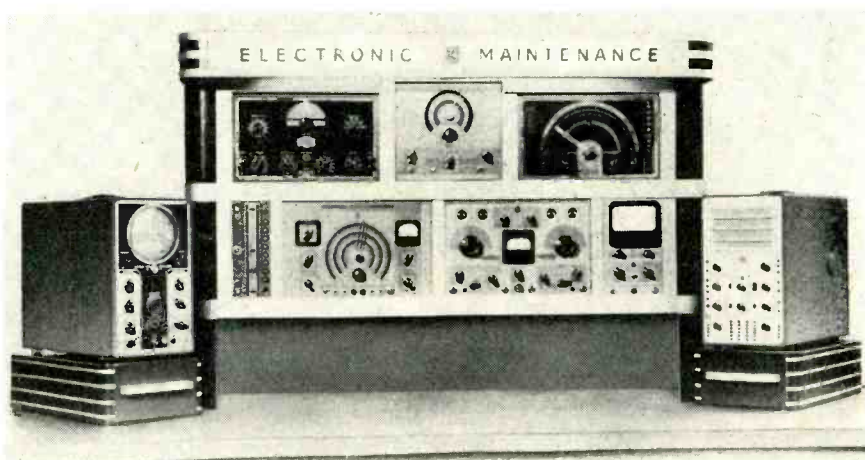
Those dealers, servicemen, and jobbers who realize the importance of this trend have been alert to the possibilities of modernizing their service shop installations and they are conscious of the effect such modernization is bound to have on the future of their own business.

They have been reading articles and following the photographic evidence of typical cases of modernized establishments, presented in nearly every issue of popular radio trade magazines, and have considered the possibilities as related to their own shops. Accordingly, dealers the nation over, who formerly considered service work as a necessary evil, are showing a marked interest in setting up a first-class, completely equipped shop. They realize that reliable and efficient handling of their customers' service problems can be made a profitable business. Also it goes a long way in preparing a list of customers with already lowered sales resistance which will be found extremely valuable when the time comes for worthwhile sales.

As our chief concern lies in the maintenance of radio and allied equipment and in order better to understand our needs, let us take a general survey of the present situation regarding test equipment facilities for the radio service trade.

To some radio repairmen the ownership of modern test equipment brings a feeling of personal pride. While this is a characteristic of human nature, in many cases the possessors of a beautiful big display are quite contented merely to admire it, even though they may not understand the full extent of its usefulness. Of course, the possession of a fine piece of test equipment is likely to stimulate an ultimate desire to

Here is the answer to the most vital and perplexing problem which confronts every radio service dealer, whether well established or a new-comer to the service field



An example of good planning; all testing instruments are placed within easy reach of one or more men who may sit or stand working at this bench

become fully proficient in its operation.

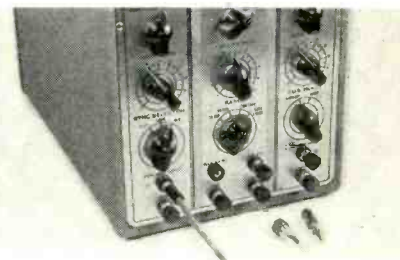
Frankly speaking, many owners of "show pieces" intend their impressiveness to influence customers in the completeness of their technical facilities—and this really works!

To others in the radio service business, the purchase of necessary test equipment may come as a last resort, after they finally realize that without adequate facilities they are wasting time and possibly losing customers.

Those, thus forsaking their boasted screwdriver technique, will most likely settle for the cheapest testing equipment that will take care of present needs, giving little thought to future servicing requirements.

To the practical commercial operator, however, test instruments are his tools. They mean just as much to him as the can opener does to the housewife and the socket wrench to the auto mechanic. This owner judges the usefulness of his equipment, not by its initial cost or the many claims of what

it will do, but by its actual contribution to the earning power of his shop. The cost of test equipment is a part of his total investment and while it can be amortized over its contemplated lifetime, this cost must be justified in the reflected light of return in dollars. This holds true whether the prime purpose of any test instrument is to *extend facilities* or to *save time*.



It pays to look for the little extra conveniences when selecting test equipment. Shown here is a removable binding post and some interchangeable pin plugs

* Test and Measuring Equipment Section, RCA, Camden, N. J.

TEST EQUIPMENT

If the reader has by now recognized himself in any of the above groups of test equipment users, the matter of his financial resources still remains to be considered when the time comes for him to select his test instruments.

How Much — What Kind!

The radio service trade includes anything from chainstore operators to

shop, so let us sketch an ideal service setup, in the hope that those who desire such an installation may achieve it through the purchase of units one at a time.

While looking forward to owning the most modern test facilities, the serviceman should realize that it is entirely feasible to buy used equipment. As a rule, test equipment is not dis-

radio service and possibly sound equipment; tomorrow, we add F-M, television, and commercial electronic equipment maintenance.

However, before we plan too far into the future, let us check the soundness of our present setup for regular radio servicing. Is it adequate? Is it efficient? Is it convenient? Is it attractive? Is it up to date? Is all of it useful?

Once we acquire good solid facilities for the job on hand — the job that our income must be derived from, it will be easy to expand later. By the same reasoning it would be economic folly to buy television equipment before it is actually required; it would be especially foolish to buy it at the expense of some other instrument needed for present receiver testing.

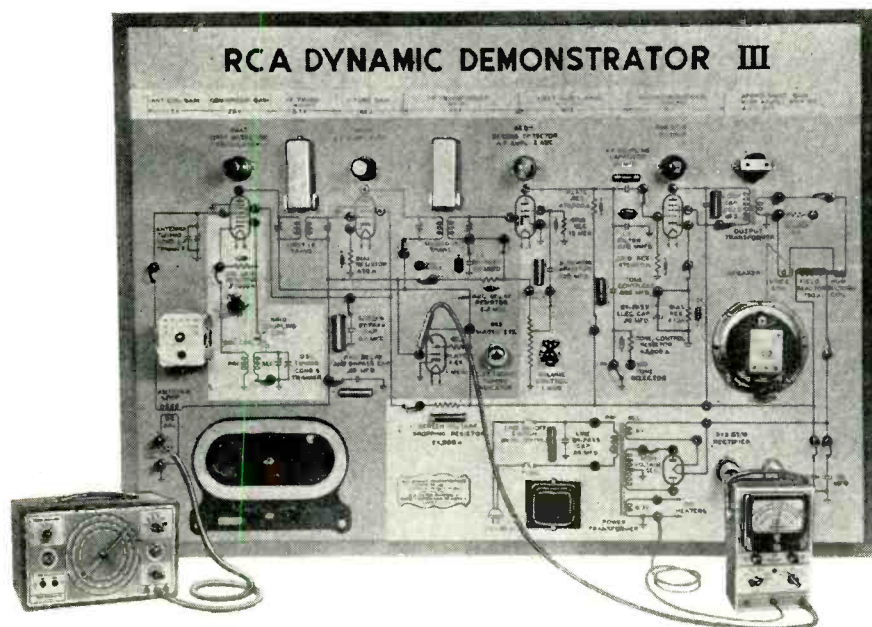
Real Essentials

We should consider, beside a few small portable instruments for outside servicing, the following as essential for present requirements: a good high-impedance a-c and d-c voltmeter, an accurate r-f test oscillator, a signal tracer and intermittent analyzer (such as the Chanalyst), a tube tester, an audio oscillator, and a substitute speaker unit.

While personal preference, specialized work, and other factors may require additional minor items, the six units listed above can be conveniently clustered for maximum efficiency within arm's reach from one sitting or standing location. If a serviceman is satisfied with this complement as a complete a-m service bench, he should next entertain the idea of a separate setup for f-m, television, and other new service requirements.

A second test bench intended for f-m and television servicing can be tentatively planned to contain a sweep generator, crystal calibrated markers, a high-frequency oscilloscope, a high-frequency voltmeter, a television test oscillator, and a bar generator or some other type of video modulator. This makes six more units, justifying a second cluster for convenience's sake. Also it makes it possible to handle a high-frequency job without interfering

[see page 77]



If a demonstrator is available, it is smart to try equipment performance with typical problems

individuals engaged in part-time service work. They are all faced with the fact that their future in the service trade may become jeopardized without the regular utilization of test equipment, capable of keeping pace with the progress of electronics in ever widening fields.

While established service organizations may buy a complete test unit made up of a number of standard instruments, those just entering the service field may be satisfied with a small multi-tester, tube checker, and oscillator as sufficient initial equipment.

Regardless of his present commercial status, nearly every radio serviceman aspires to operate eventually a complete up to date Service Dealer's

carded, but replaced by something more modern or of greater capacity, and the used equipment is still serviceable. Distributors, therefore, should be encouraged to take advantage of the used-equipment market; it will increase trade-in values for those who wish to purchase the most modern equipment, and it will make useful items available to the fellow with limited purchasing power. The net result would be a desirable technological advance for the service trade, plus an opportunity for the distributor to increase his test equipment business.

Getting back to the ideal service arrangement, let us check our requirements from the standpoint of the present volume of business and the business we expect to be doing later. Today it's

SERVICE MARKET

in

Industrial Electronics

by OSCAR E. CARLSON
E.S.M.W.T. Instructor, Temple University

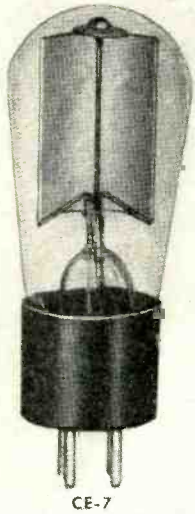


Fig. 1 — A commercial phototube

ARTICLE 4

Radio servicemen located in industrial sections have within their "service areas" an ever increasing field of repair and maintenance business in the expanding field of industrial electronics.

OVER 100 years ago, in 1839, E. Becquerel, a French physicist, discovered that two metal electrodes immersed in an electrolyte showed a difference of potential upon illumination of one of the electrodes.

The photoelectric effect, the liberation of electrons from matter under the influence of light, was discovered by Hertz in 1887. From this humble beginning the technical development of selenium and cuprous oxide photo-cells of the "barrier" type progressed very slowly until the early 1930's.

Current limitations kept photo-cells from commercial use until the discovery of amplifier type electron tubes. Parallel with such development was that of the phototube. The first general use of phototubes was in 1928 in the reproduction of sound motion pictures.

We have spoken of "photocells" and "phototubes". Let us proceed to definitions and data concerning these items which find such a large number of industrial applications.

Photocells or "photo-electric cells" are open to several definitions. Some authorities interpret "photoelectric cell" to include all devices capable of producing changes in an electric circuit by the action of light. Two types of cells are generally used in industrial applications. We will consider briefly these two types, the photo-emissive type and the barrier layer type cell. The photo-emissive type is constructed in the form of an electron tube and is usually called "phototube."

The phototube in general use consists of two electrodes in an evacuated glass envelope. Such a tube is a special form of diode. One electrode, the cathode, has the property of emitting electrons when its sensitized surface is exposed to light. These elec-

trons are attracted to the second electrode, the anode, or plate, if that element is made positive with respect to the cathode. The number of electrons emitted from the cathode depends upon the light intensity and

color, or wavelength, of the light. The electron flow, or current, may be used as a control voltage in conjunction with amplifier or other type electron tubes to perform many industrial functions. Thus we may actuate meters or

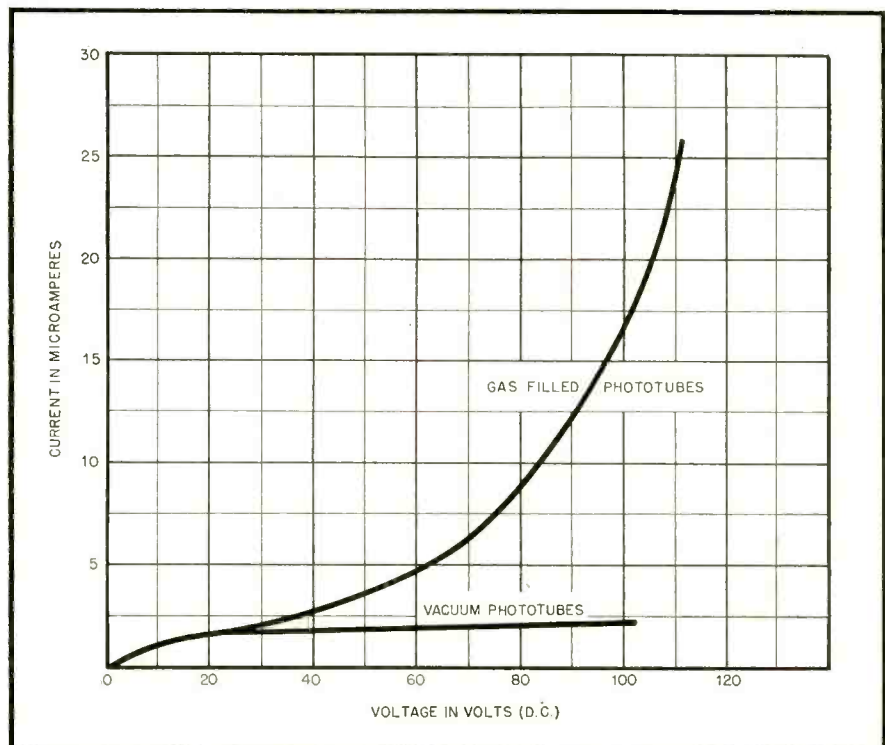


Fig. 2 — Curve showing difference in current output between vacuum and gas-filled phototubes

relays as a function of light intensity and wavelength. Fig. 1 shows a typical phototube as used in industrial applications.

Such tubes may, as other diodes, be either of the vacuum type or they may be gas filled. The presence of inert gas in a phototube serves to allow greater emission from the cathode by reduction in the space charge effect. The operation is similar to that of the phanotron. Some difference in operation is necessary to prevent the ionization from reaching the point of "glow breakdown". At that point further current increase would be independent of light intensity. A resistance in series with the phototube limits the possible current to below the level for glow breakdown. Proper limitation of the applied plate potential to within the range specified by the manufacturer is imperative. Fig. 2 illustrates the difference in current output between vacuum and gas filled phototubes as manufactured by the Continental Electric Co. under trade name of "Cetron".

The sensitivity of a phototube is dependent upon the type of material on its light sensitive cathode. Variations in the type of emissive material allow for the control of spectral sensitivity, i.e., the sensitivity for various wavelengths of light all of same intensity. Some phototubes very nearly duplicate the sensitivity of the human eye. Others are more sensitive in the near infra red region and some in the blue and near the ultra violet part of the spectrum. This is more clearly seen by reference to Fig. 4.

Gas type phototubes are more sensitive than the vacuum type but offer one disadvantage similar to that of the phanotron. This is the lag effect due to the gas content ionization and de-

ionization time. This limits the upper frequency of light variations to which a given tube will respond or follow. Fig. 3 illustrates the frequency response curve for a "Cetron" gas filled phototube which is essentially flat to 10,000 cycles per second. Such a tube is satisfactory then for variations in light intensity that occur within the audio frequency limits.

Most manufacturers of phototubes recommend that gas type phototubes should be used where large currents or high sensitivity are required. Vacuum tubes should be used where a high degree of constancy and exact relation between current and light are necessary.

Light Theory

Visible light constitutes but a small part of the radiation sent out by any self luminous body or object. Light is of electromagnetic character. It is of the same character as the energy found in the swiftly changing electric and magnetic fields near circuits in which oscillating electric currents are passing. *Light and heat are both very short electromagnetic waves.*

The human eye cannot detect, or perceive, waves longer than 7000×10^{-10} centimeters. 10^{-10} meters is equal to 10^{-8} centimeters or one Angstrom unit. The eye cannot perceive waves shorter than 3500 Angstrom units or 3500×10^{-10} centimeters. As seen from Fig. 4 the spectral response of the human eye is very similar to the response curve we would plot for a tuned LC circuit. The frequencies differ. This figure further shows the spectral sensitivity of two types of phototubes.

The sensitivity of phototubes is usually expressed in micro-amperes per lumen. Since light can be regarded as

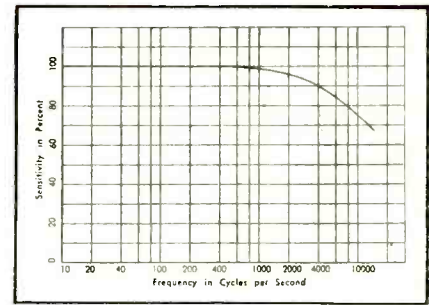


Fig. 3 — Curve showing frequency response of an average gas-filled Cetron phototube. Note the slight drop over the normal hearing range.

a flow of luminous flux, we see that the dimensions in measurement of light are those of power measurements also. The unit applied to light power is the lumen. One lumen will yield an illumination of one foot candle at a distance of one foot from the source. *The candle power is the unit of luminous intensity.*

12.6 lumens make up a candle power. The number of lumens of light falling upon a surface from a point source of light may be expressed as follows:

$$L = CA/d^2$$

where L is lumens; A is area of surface in square centimeters, d is the distance to the light source from the source upon which the light falls, expressed in centimeters.

On such gas phototubes as the 918, 921, 923, or 930 the light flux on the cathode should not exceed approximately 0.02 lumens. Vacuum phototubes are operated up to 1 lumen of light flux on the sensitive cathode. Gas phototubes have an average sensitivity of 200 micro-amperes per lumen and a vacuum phototube about 30 micro-amperes per lumen.

[see page 75]

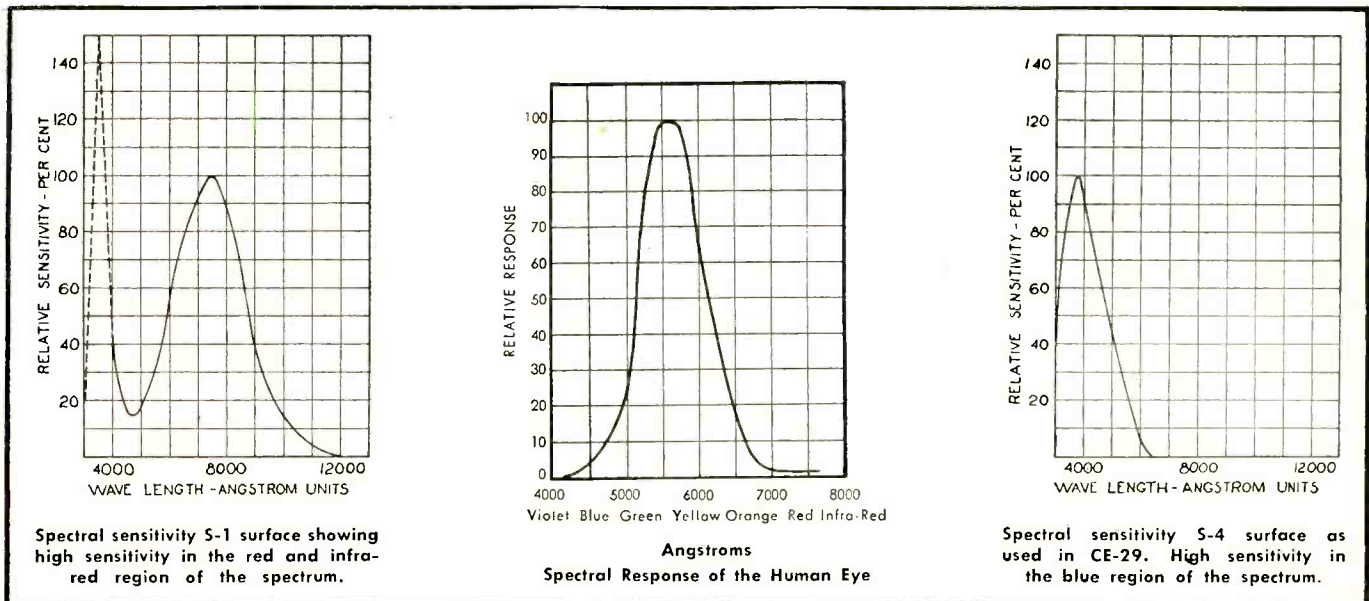


Figure 4—This and other Graphs, courtesy Continental Electric Co.

VOLTAGE GAIN

Using a Signal Gen

by S. L. MARSHALL

THE advent of vacuum tube voltmeters which are more sensitive than their previous prototypes, and which do not unbalance the circuit under test, makes it more possible for the serviceman to apply dynamic testing techniques, or signal gain measurements, in receiver service. Voltage gain per stage data is the most accurate yardstick or check of a receiver's performance. The ability to make these tests enables the radio mechanic to operate more efficiently, and results in greater customer satisfaction. Applied to the more complicated receivers, where ordinary static tests do not readily reveal certain defects, dynamic testing is much to be preferred.

The time is at hand when any reliable manufacturer worthy of the rating must make stage gain data available to the dealer. One large manufacturer has already taken the lead in this direction, and others are about to follow. Where this data is not available, and where the technician is reasonably assured of repeated service on a particular model, it is worth his effort to make these measurements himself.

In order to understand the basic theory of dynamic testing more clearly, a picture of how the receiver amplifies the weak signal in the antenna to a point where it is powerful enough to operate a loud speaker, should be clearly envisioned. We illustrate, in *Fig. 1*, the block diagram of a typical superheterodyne. In order for the receiver to operate at its rated output the signal voltage appearing at the grid of the output tube, *point F*, must have a pre-determined amplitude. Any voltage value lower than this amplitude results in decreased volume. The signal voltage that will operate the output tube at its rated output can be readily calculated by referring to the grid bias voltage of the tube.

For a class "A" amplifier the maximum signal voltage should be somewhat less than the grid bias. For example, the recommended grid bias on a 25L6 is 7.5 volts. This means that

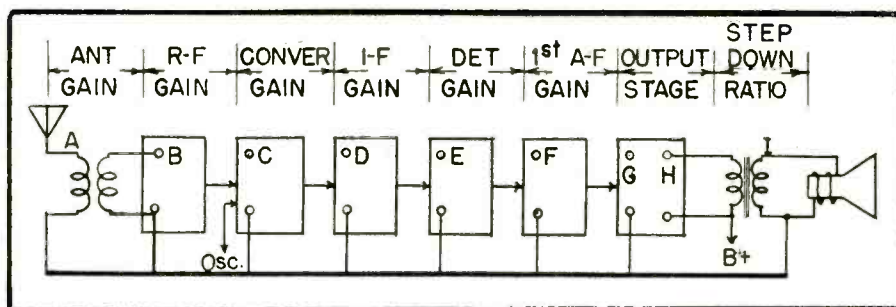


Figure 1 — Block diagram of typical super Heterodyne

the incoming audio signal should not exceed a maximum value of 7.5 volts, or an effective value of $7.5 \times .707 = 5$ volts (app.).

Since the signal voltage across the primary of the antenna transformer is a few microvolts or so for a weak station, the amplification required is more than 1,000,000. The manner in which each stage contributes to the overall amplification of a receiver represented by type illustrated in *Fig. 1* is discussed in the following paragraphs.

Except for the antenna and output circuits, stage gain is conventionally measured between the grids of successive tubes. Thus, assuming a constant signal input, the gain of any one stage in a receiver is the signal voltage developed across the grid and ground of the end tube in a stage *divided by* the signal voltage developed across the grid and ground connections of the previous tube. Referring to *Fig. 2*, the dotted lines, *A-A* and *B-B*, are the stage boundaries. The gain of this stage is equal to the signal voltage at *B-B* divided by the signal voltage at *A-A*.

The gain of an antenna stage is measured between the antenna terminal and the grid of the first R.F. or mixer tube if no R.F. tube is used. If a loop antenna is employed, the gain is measured between the high side of the primary of the loop and the grid of the following tube.

Output stage gain is measured between the grid of the output tube and

its plate. There is no point in measuring the gain between the grid of the output tube and the voice coil since this represents a step-up of voltage in the tube and a step-down in the output transformer. However, the relative signal voltages at the plate and across the voice coil can be used to check and determine the step-down ratio of the transformer.

The equipment necessary to make tests of stage gain consists essentially of a signal generator and a vacuum tube voltmeter. The signal generator must be capable of delivering a strong R.F. signal and must also contain a switch for cutting in or out audio modulation on this carrier. The V.T.V.M. should be sensitive enough to render good indications at the voltages and frequencies obtained. Sensitivities of two to three volts is generally satisfactory. Higher sensitivities will provide even greater flexibility of measurement. The loading effect of the instrument on the circuit to be measured should be ten megohms or higher at any frequency. To prevent detuning the circuit under test, well designed V.T.M.S.'s utilize a probe which contains a tube with a very low input capacitance.

An excellent check on the suitability of a signal generator and a V.T.V.M. as a combination is to connect the V.T.V.M. directly to the output terminals of the signal generator. If a fair indication is observed on the V.T.V.M. at maximum output of the

MEASUREMENTS generator and a V.T.V.M.

Dynamic Testing Techniques Expounded Upon

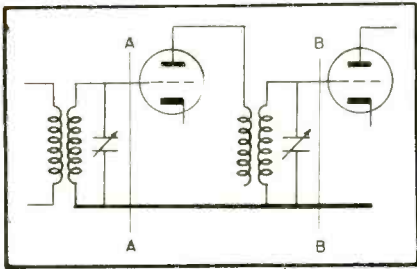


Figure 2—Typical stage limits

generator for all frequency ranges, the combination is suitable for dynamic testing.

When making measurements of gain, the R.F.-I.F. sections and the audio frequency unit are tested separately. In order to test the R.F.-I.F. section properly, two sets of measurements are made, one with and the other without the A.V.C. voltage acting on the circuits. The A.V.C. voltage can be short-circuited by shorting out the conventional A.V.C. filter condenser to ground. This condenser is the one farthest removed from the diode load resistance. In this manner a check on the A.V.C. action is also obtained.

Referring to *Fig. 1*:

- A corresponds to the antenna connection on the ant. transformer.
- B corresponds to the grid connection on the 1st r-f tube.
- C corresponds to the grid connection on the converter tube.
- D corresponds to the grid connection on the i-f tube.
- E corresponds to the diode plate connection on the detector.
- F corresponds to grid connection on the 1st audio tube.
- G corresponds to grid connection on the output tube.
- H corresponds to plate connection on the output tube.
- I corresponds to the high side of the speaker voice coil.

Using an unmodulated 600 K.C. signal from the generator, and with the V.T.V.M. connected between *E* and ground, the receiver is tuned in at 600 K.C. This frequency has been chosen as standard by a prominent

manufacturer for the broadcast band gain data of his receivers. Measurements of gain in the short wave bands should be made at the lowest frequency in that band. To insure stability of readings the equipment should be subjected to an initial warming up period of about 10 minutes.

After the first reading is recorded, the probe of the V.T.V.M. is connected to *D* and the reading recorded again. The gain of the I.F. stage between *D* and *E* is the reading at *E* divided by the reading at *D*. Thus, if the first reading is 3 volts and the second, .05 volts, the stage gain is $3/.05 = 60$. Ordinary I.F. stage gains vary between 50 and 200 without A.V.C., and between 25 and 100 with A.V.C.

Measurements at points *C* and *D* represent the amplification that takes place between the converter tube and the 1st I.F. tube. Gains in the order of 50 and 100 are generally obtained in this circuit. Since the incoming signal, representing an R.F. value, is converted and amplified to an I.F. voltage of higher amplitude, we designate this action as a conversion gain.

The V.T.V.M. probe is now moved to point *B*. The reading at *C*, previously obtained, and the new reading at *B* determines the gain in R.F. stage. Values of gain in these circuits vary between 5 and 10 for a resistance coupled stage, and between 5 and 50 for a transformer coupled stage.

As is often the case, the gain of a circuit combination between the points where the signal is injected and the signal is measured may not be high enough to obtain an intelligible reading on the V.T.V.M. As a result, the signal generator output may have to be advanced. It is important that this output be the same when taking any two comparative gain measurements.

Proceeding to the antenna transformer, the gain of the latter may be obtained by dividing the reading at *B* and the reading at *A*, this point representing the high side of the antenna transformer primary. The reading at *A* is, in effect, the output voltage of the

signal generator. Gains of from .5 to 10 are usually observed in antenna transformers.

The total gain of the R.F.-I.F. section from the antenna terminal to the diode plate of the detector may be calculated by multiplying all the individual gains by each other. Thus, in a typical receiver where the stage gains are as follows:

Antenna transformer gain	= 10
R.F. gain	= 5
Conversion gain	= 50
I.F. gain	= 60

The total R.F.-I.F. gain = $10 \times 5 \times 50 \times 60 = 150,000$. This means that a 10 microvolt signal appearing at the antenna terminal will produce a 1.5 volt signal on the diode plate of the detector.

It may be required to check the gain of an individual circuit unit such as an I.F. transformer. This can be done by connecting the signal generator across the primary of the transformer, and measuring the voltages across the primary and secondary of this transformer. The gain, then, is equal to the ratio of these two voltages. I.F. transformer gains vary between .5 and 1. This may seem to be rather low considering the relatively high *Q*s of the component coils. But if we will recall that the coefficient of coupling in an I.F. transformer is purposely kept low to obtain good selectivity, the reason for this relatively low gain becomes readily apparent.

Detectors of the diode type serve primarily to separate the audio component of the signal from the carrier. A suitable filter in this circuit bypasses the R.F. carrier to ground. The audio signal developed across the diode load resistance is then transferred to the first A.F. stage. Therefore, between *E* and *F* no voltage gain takes place, and no gain measurements are made. However, if a plate or bias detector is employed, the gain between these points may vary between 10 to 30.

To measure audio stage gain, an audio input signal must be used. The

[see page 74]

CIRCUIT COURT

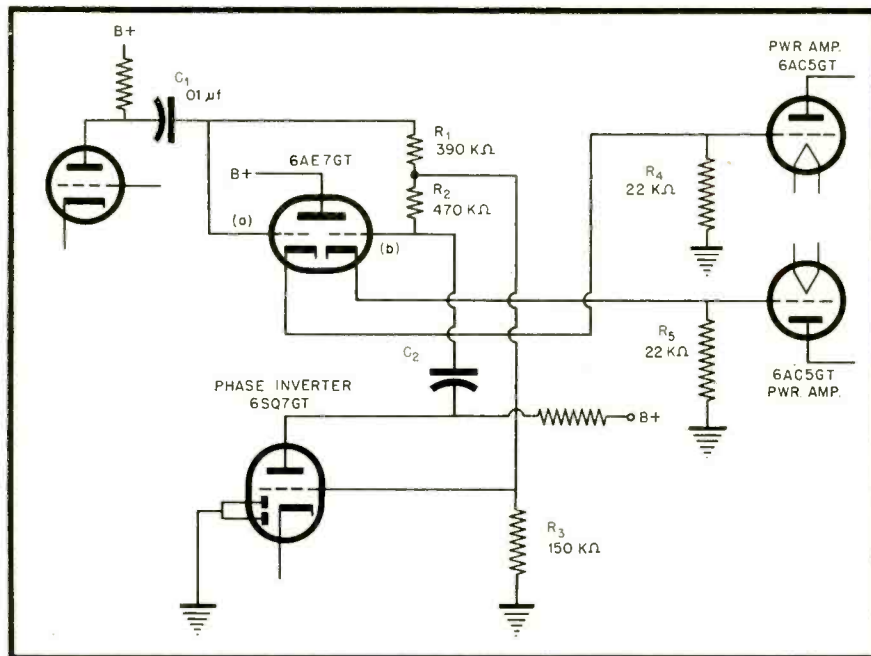


Figure 1

DYNAMIC COUPLED AMPLIFIER

A form of coupling audio circuits which is seldom employed is shown in *Fig. 1*. In this circuit, the 6AE7GT is dynamically coupled to the push-pull 6AC5GT power output tubes. Note that this is essentially a cathode-driven amplifier, the two cathodes of the 6AE7GT being directly coupled to the grids of the output tubes. Because the grids of the 6AC5GT's are coupled to the low resistance cathodes, the grid resistors are much lower in value than are customarily employed.

Another interesting feature of this circuit, which is used in the Motorola Model 101R21, is the phase inverter arrangement. The audio signal is applied directly to the first grid (a) of the driver tube, and through a voltage divider circuit composed of R1, R2, and R3, to the second grid (b). A portion of the audio signal is also fed to the 6SQ7GT phase inverter, taken from the junction of R1 and R2. The output of the phase inverter is coupled by C2 to the driver grid (b). Because two audio signals which differ in phase arrive at this same grid, any excess of one signal tends to counterbalance an increase in the other. Only a small portion of the possible gain obtainable from the phase inverter tube is actually used, which tends to keep the output uniform.

DIODE-PENTODE DETECTOR AMPLIFIER

The circuit shown in *Fig. 2* is a portion of that used in the 4-tube, 2-volt superhets, Models E-10835, and E-10836, manufactured by the Allied Radio Corp. Values of plate and screen resistors for the pentode section should be carefully followed in making replacements, as with all other pentode

amplifiers. Any wide departure from the proper values will result in distortion, low amplification, or both.

BASS AND TREBLE CONTROL

An unusual arrangement for bass and treble tone control is employed in the Hallicrafters Model S-31-A High Fidelity receiver. The circuit for tone control is illustrated in *Fig. 3*. Two

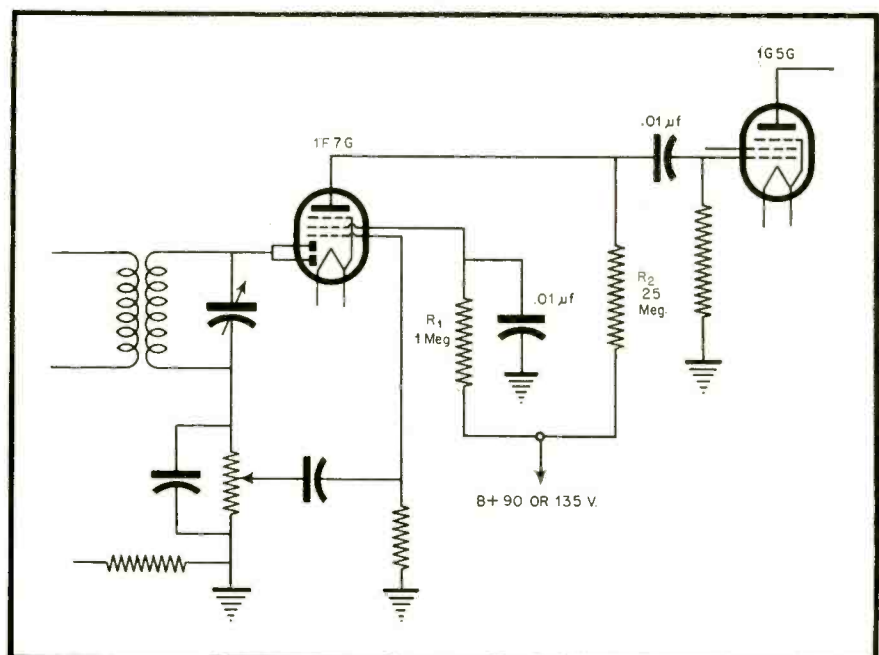


Figure 2

Each month we present in this department discussions of new or unusual circuits employed in modern radio receivers, to help simplify your servicing problems.

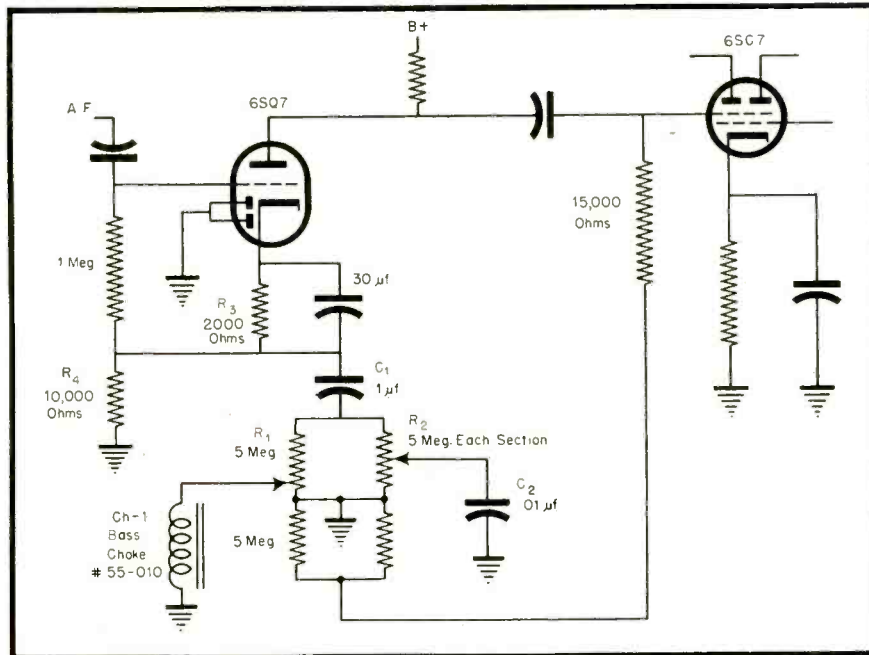


Figure 3

dual 500,000-ohm potentiometers are used, the midpoint of each being grounded. To the moving arm of R2 is connected the .01 mf condenser C2, and when this arm is at its lowest position, high frequencies are by-passed to ground and treble response is a minimum, falling to minus 10 db from 10,000 to 15,000 cycles. When the moving arm of R2 is at midpoint, C2 is connected directly to ground, and is

therefore out of the circuit. At the highest point, C2 connects in series with C1 to by-pass R4 to ground, reducing degeneration in the input circuit of the 6SQ7 and thereby increasing the gain, especially at lower frequencies.

The same analysis holds for the operation of the bass choke. At midpoint on R1, the choke is grounded and is therefore out of the circuit. This is the

normal position. At its highest position, and when the moving arm of R2 is also in this position, a parallel resonant circuit is formed which is flattened somewhat by the shunting effect of R4 through C1. With R1 at minimum and R2 at midpoint, bass response is at a minimum, because the impedance of the bass choke is low at low frequencies, and this choke forms the greater portion of the impedance of the grid circuit of the 6SC7. Treble response becomes greatest under these conditions, because the impedance of the choke rises with an increase in frequency, reaching a maximum of approximately plus 10 db from 6000 to 10,000 cycles, and continuing to more than plus 6 db at 15,000 cycles.

By manipulating these two controls it is possible to obtain an essentially flat response from 100 to 8,000 cycles and down but 2 db at 15,000 cycles and 3 db at 30 cycles. Alternatively, two peaks at about plus 10 db may be obtained in the bass and treble regions, or about the same degree of attenuation in either or both the bass or treble ranges.

I-F WAVE TRAP

In aligning receivers incorporating i-f wave traps, this circuit is often neglected, or worse, improperly adjusted. Often this occurs because the trap appears in the r-f instead of the antenna section. A typical circuit incorporating

[see page 63]

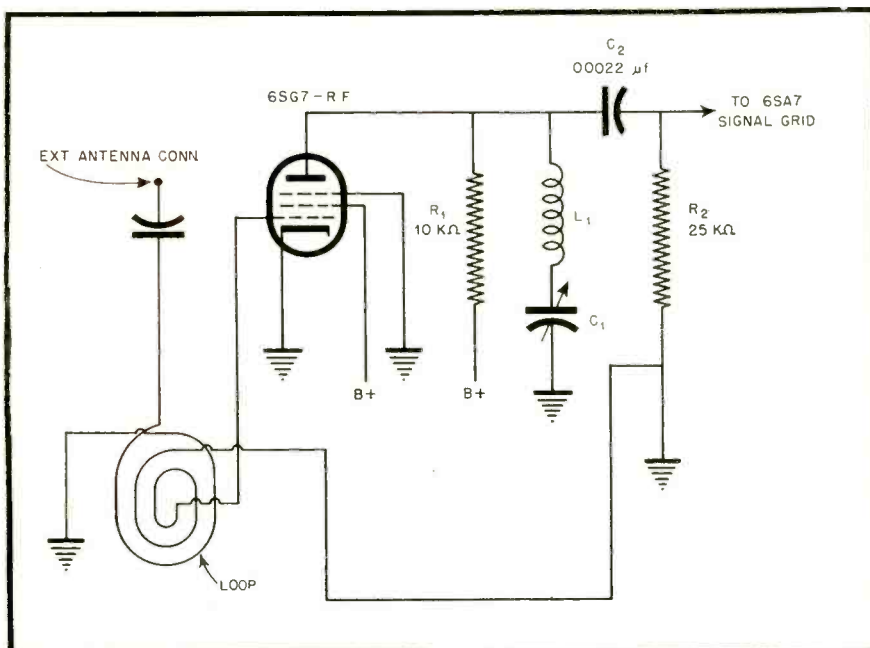


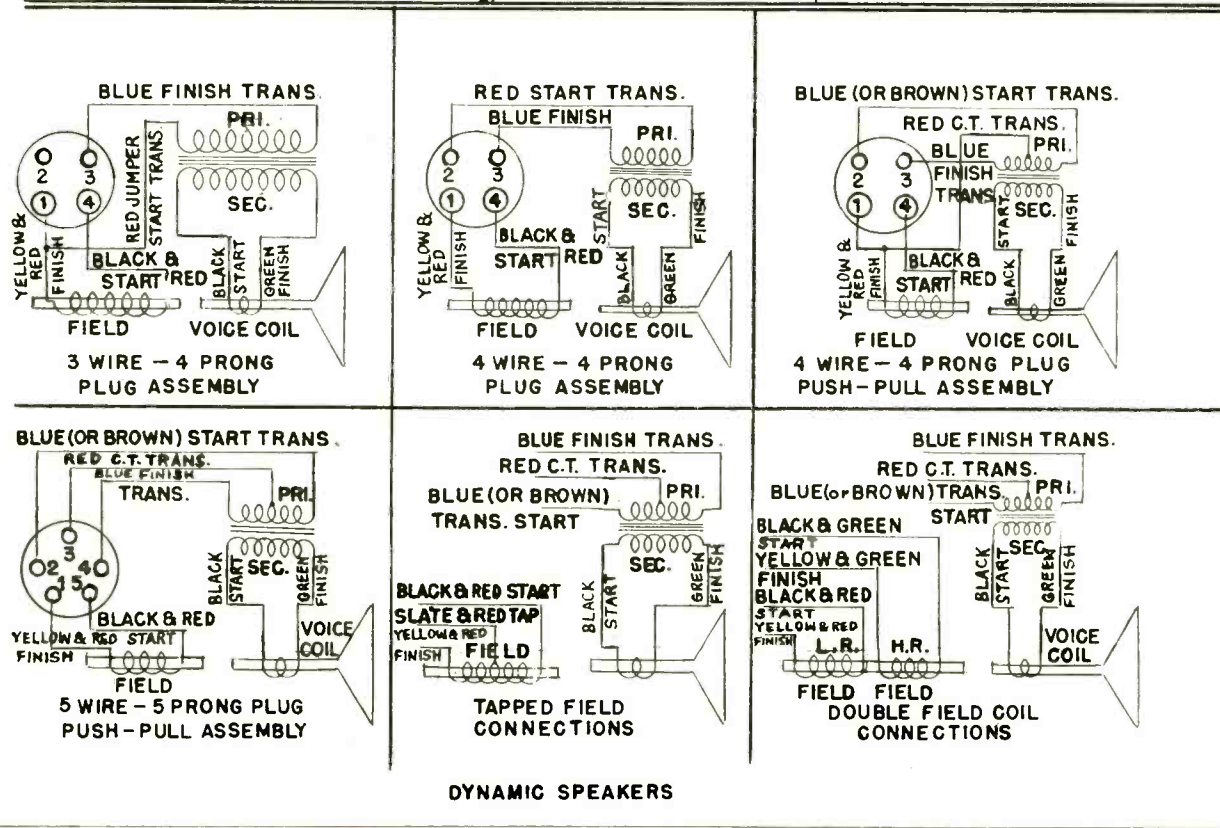
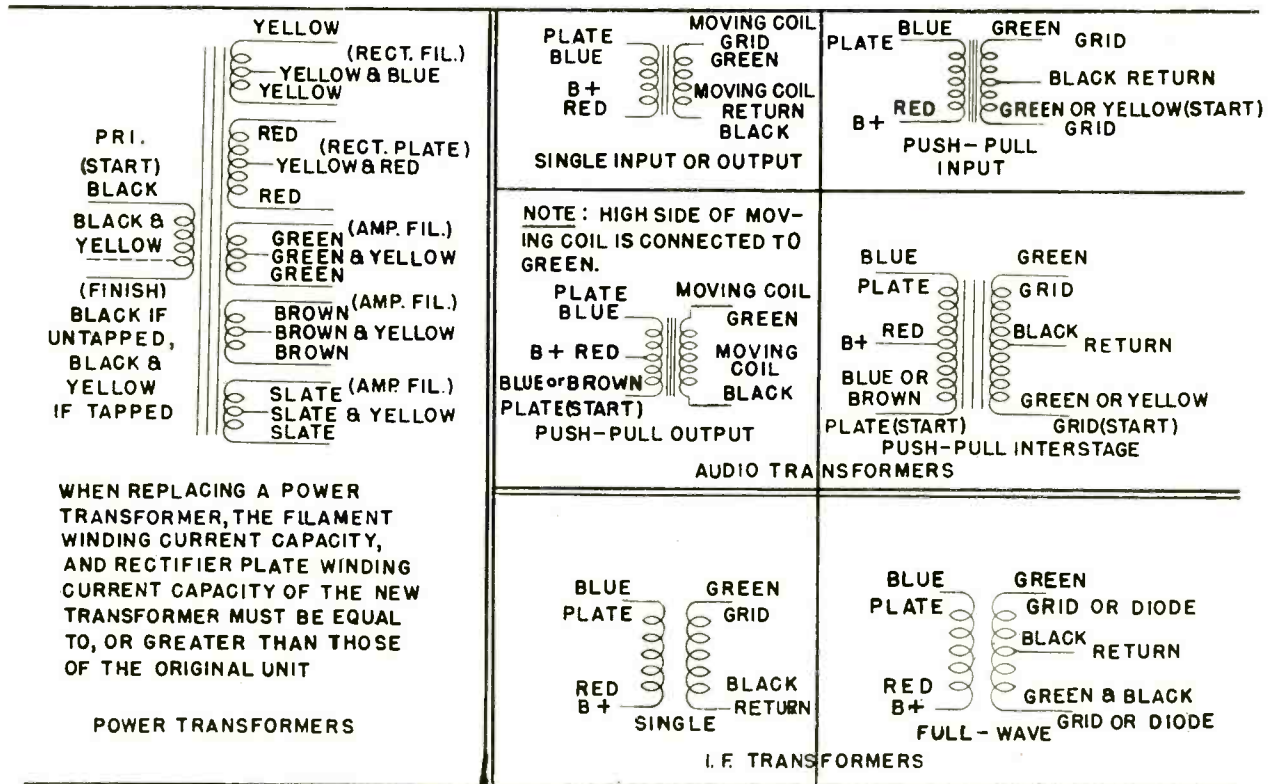
Figure 4

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FOR SALE—Hallcrafters SX-32 communication receiver in excellent condition (just repaired); Hallcrafters IIT-7 frequency standard and Weston 774 Checkmaster. Tom Crede, 11 Avenue B, Latrobe, Pa.

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SELL OR TRADE—National Company NC-81X communication receiver with 8" p.m. speaker. Want SX-24 or SX-25 receiver. Bullock Radio, 1719 Miller st., Indianapolis 3, Ind.

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First find a location for the rectifier tube, drill hole and mount the socket. Remove all battery wires. Connect one side of the line cord to terminals 2, 3 and 5 of the 117Z6 socket. (All references shown in Fig. 1). Other side of the cord to the A battery switch and ground the other side of the switch, and also terminal No. 7 of the 117Z6. Introductions for other types of rectifiers will be found at the end of this article.

From 4 and 8, the cathodes of the rectifier connect a 1 W 1,500 ohm resistor to terminal No. 4 of the 3Q5 or output tube. This is the filter resistor and must have a 20 Mfd 150 volt condenser, C1 from each end to ground for 60 cycle operation or 40 Mfd for 25 cycle operation.

It is quite likely that you will find one of each filament connected to ground. All of these grounds must be removed and the filaments connected in series as shown in diagram Fig. 1. The condensers and resistors connected to the No. 2 and 7 terminals may be left where they are, at least for the present. (We are using terminal numbers of octal tubes. If the loctal series is used the filament terminals are 1 and 8 instead of 2 and 7. The loctal 1LA6 or 1LC6 is the equivalent of 1A7, 1LN5 or 1N5, 1LH4 or 1H5 and 1LA4 or 1LB4 of 1A5 or 1T5). If there are more tubes than are shown in the diagram put them between the 1H5 and 1N5.

Connect a 2,500 ohm between the rectifier cathodes and No. 4 of the 3Q5 or output tube. This is the filament dropping resistor and has a filter condenser of from 40 to 200 Mfd connected between its low end and ground.

*From 5th Edition, *Wartime Radio Service*, Published by City Radio Co., Phoenix, Ariz.

This condenser should be rated at 25 volts because if a tube burns out the voltage rises and might break down a 6 or 12 volt type.

The filament dropping resistor should be 10 watts if mounted above the chassis, and at least 20 watts if mounted underneath where it cannot radiate the heat so readily. There is a 2200 ohm 16 watt flexible that seems to be quite plentiful and rather low priced which is very easy to mount as it is insulated. In case it is used the resistor R3 may have to be of the order of 500 ohms to hold the voltage down.

Wire in the resistors R4 and R5 permanently and R3 temporarily as it may have to be changed. If 1A5 or 1T5 is used instead of the 3Q5 or 3B5 the resistor R4 is omitted. The purpose of R4 and R5 is to bypass the current passed from plate to filament in the output tube and avoid overloading the other filaments.

Now check the grid resistors. The resistor from the grid of the output tube should go directly to ground and

each of the others to its own No. 7 negative filament. The lower end of the volume control is connected either directly or through a resistor to ground or to a filament (which has been disconnected from ground). Leave it where it is for trial and if there is distortion try returning it to the filament circuit between the 1A7 and 1H5 for 1.4 volt bias or between 1H5 and 1N5 for 2.8 volt bias and leave it where tone is best.

Now make up a resistor to take the place of a set of tubes. The resistance of each 1.4 filament is approximately 28 ohms and for the set shown in Fig. 1 should be 140 ohms. If it had a 1A5 or 1T5 in the output the resistance would be 28 ohms less or 112, and if there should be an additional 1.4 tube it would be 28 ohms more, or 168 ohms. Connect this resistor across from No. 2 of the output tube to ground. Put in the rectifier tube, plug in and turn it on. The voltage across the resistor should be just slightly less than 7 volts. If over 7

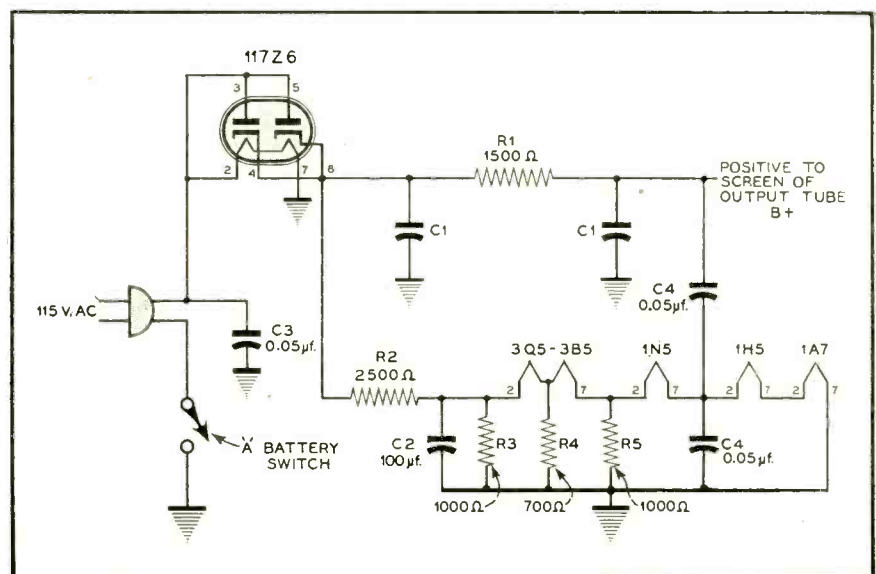


Figure 1

volts replace resistor R3 with a lower value. If under 6.2 replace R3 with higher value.

In case you should have difficulty remember that increasing the capacity in getting the correct filament voltage, of C1 at the rectifier increases the voltage and if this condenser does not have sufficient capacity you cannot get the correct voltage. When the voltage has been adjusted remove the resistor from No. 2 filament to ground and put in the tubes.

The bypass condensers C4 may already be in the set. If they are not and there is a tendency to distort or oscillate put them in, and make sure that all No. 1 terminals are grounded to chassis. If the radio does not have a series condenser in the antenna it is necessary to put a .01 between the antenna and coil to avoid burning out the coil if the antenna should be grounded.

Many kinds of rectifiers may be used instead of the 117Z6 which is the most popular on account of not requiring a resistor cord. For 25Z6 use a line resistor cord of 300 ohms, connecting red to switch, black to 3 and 5 and resistor to 2. For 35Z5 and 35Z4 use a 540 ohm resistor cord connecting black to 5, red to switch and resistor to 2. Terminal No. 4 need not be connected as there is only one cathode. For 25Z5 use a 300 ohm cord connecting red to switch, black to 2 and 5, resistor to 1, ground 6 and connect the filter resistors to 3 and 4. These are the most popular rectifiers but several others may be used with correct line cord resistor.

Some types of Philcos have the volume control grounded to chassis. Removing the grounding lug does not remove the ground. It is necessary to drop the control back and saw through the metal strip on front of control. Some Crosleys have the filament shorted to No. 1 inside the socket. Watch out for them. Only remedy is to change the sockets.

You may expect to have some bugs to fight out of the first job so don't be discouraged if it doesn't work perfectly right off the bat—get after the bugs.

FM — Television

[from page 38]

relatively few television receivers in use, each antenna became a custom installation. In the future, however, as postwar production places millions of new television receivers in use, this special treatment will be impossible and antenna installation will become the everyday job of service men.

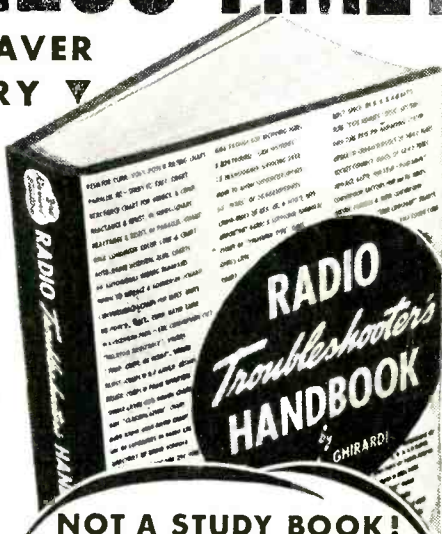
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RADIO RETAILER EDITION

DEC.

Published by SYLVANIA ELECTRIC PRODUCTS INC., Emporium, Pa.

1945

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Stank Hdwe. Co.

LANCASTER, PA.—
Steiman Hdwe. Co.

PHILADELPHIA, PA.—
Philadelphia Distributors

PITTSBURGH, PA.—
J. E. Miller Co.

PROVIDENCE, R. I.—
Providence Elec. Co., Inc.

BRISTOL, TENN.—
Hamilton-Bacon-Hamilton Co.

KNOXVILLE, TENN.—
House-Hasson Hdwe. Co.

MEMPHIS, TENN.—
Orgill Bros. Co.

NASHVILLE, TENN.—
Gambill Dist. Co.

DALLAS, TEX.—
Butler Bros. Co.

EL PASO, TEX.—
Albert Mathias & Co.

SALT LAKE CITY, UTAH—
Standard Sup. Co.

BURLINGTON, VT.—
J. S. George Sup. Co.

RICHMOND, VA.—
Richmond Hdwe. Co.

SEATTLE, WASH.—
Seattle Radio Sup. Co.

SPOKANE, WASH.—
Standard Sales Co.

HUNTINGTON, W. VA.—
Van Zandt Sup. Co.

INTERNATIONAL
DETROLA CORPORATION
(Detrola Radio Division)
Beard Ave. at Chatfield,
Detroit, Mich.
Private Brand Radio
Receivers
No Distributors

LANDERS, FRARY &
CLARK
New Britain, Conn.
Washers, Toasters, Irons,
Vacuum Cleaners, Waffle
Irons, Stoves

Note: because this manufacturer has such a large list of distributors, only the first one-third are given here—see next issue of RSD for additional listings.

BIRMINGHAM, ALA.—
Southern Lighting Co.
Wimberly Thomas Hdwe. Co.

MONTGOMERY, ALA.—
Teague Hdwe. Co.

PHOENIX, ARIZ.—
Arizona Hdwe. Co.

Al Jennings Co.
Momsen Dunnegan Ryan

FORT SMITH, ARK.—
Eads Bros.

Speer Hdwe. Co.

LITTLE ROCK, ARK.—
Bush-Caldwell Co.

555, Inc.

PINE BLUFF, ARK.—
Fox Bros. Hdwe. Co.

TEXARKANA, ARK.—
Buhrman-Pharr

EL CENTRO, CALIF.—
Imperial Hdwe. Co.

FRESNO, CALIF.—
Incandescent Supp. Co.

LONG BEACH, CALIF.—
American Wholesale Hdwe. Co.

LOS ANGELES, CALIF.—
Calif. Hdwe. Co.

Electric Corp. of Calif.

Gough Industries

Harper & Reynolds

E. W. Reynolds
Union Hdwe. & Metal Co.

OAKLAND, CALIF.—
Electric Corp.

Incandescent Supp. Co.

SACRAMENTO, CALIF.—
Thomson-Diggs

SAN FRANCISCO, CALIF.—
Baker & Hamilton

Dohrmann Commercial Co.

Dohrmann Hotel Supp. Co.

Dunham Carrigan & Hayden

The Elec. Corp.
Seller-Lowengart Co.
E. W. Reynolds Co.
Sloss & Brittain
Thompson & Holmes Ltd.

PRECISION is a hobby in MT. CARMEL, ILL.

Yes, precision is the hobby of the men and women who make up Meissner's famed "*precision-el*." The high quality electronic equipment that their skilled fingers produce each day is proof enough that they enjoy the work as thoroughly as they enjoy their after-hours hobbies. You'll find more proof in the photographs on this page.



This "precisioneer" takes the same interest in his work at Meissner as he does in his home. He proves it with a smile that is typical of *precision-el* — as typical as the precision quality of Meissner products.



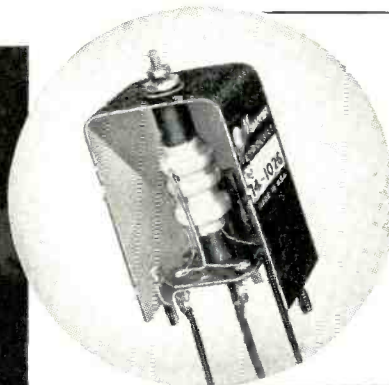
Here's a member of Meissner's *precision-el* whose smile is contagious. Delicate adjustments properly made are the reason. Higher quality in Meissner electronic equipment is the result!



It could be a new grandson or a 3-pound bass that brings a smile like this, but it's not! It's pride in a precision electronic job well done. It's a reason for higher quality in Meissner products.



Baseball broadcast? Not on your life. But it's a "homer" for this member of Meissner's laboratory staff. The satisfied smile means that the instrument he's testing is "on the Meissner quality beam."



Replace Broadcast Band Coils Easily

These Adjustable-Inductance Ferrocart (iron core) coils will replace Antenna, RF or Oscillator coils without the trouble of locating "exact duplicates" because they are continuously variable in inductance over a wide range. The inductance of the old coil is easily matched by simple screwdriver adjustment. Ferrocart iron cores add gain and selectivity to the receiver. Available shielded or unshielded, shipped with complete instructions. Order by number. 14-1026 Univ. Ant. Coil; 14-1027 Univ. R.F. Coil; 14-1028 Univ. Osc. Coil. Price \$1.50 each.



MEISSNER

MANUFACTURING COMPANY • MT. CARMEL, ILL.

ADVANCED ELECTRONIC RESEARCH AND MANUFACTURE

Export Division: 25 Warren St., New York; Cable: Simontrice

RADIO AND APPLIANCE DISTRIBUTORS

- DENVER, COLO.**—
Morey Merc. Co.
Parker Co.
- HARTFORD, CONN.**—
Sechman Hdwe. Co.
Stern & Co.
- NAUGATUCK, CONN.**—
Mr. William Davies
- NEW BRITAIN, CONN.**—
Spring & Buckley
- NEW HAVEN, CONN.**—
American Distr. Inc.
Bronson & Townsend Co.
- WILMINGTON, DEL.**—
Arteraft Elect. Supp. Co.
Delaware Hdwe. Co.
- WASHINGTON, D. C.**—
Doubleday Hill Elect. Co.
Graybar Elect. Co. Inc.
Mav Hdwe. Co.
- GAINESVILLE, FLA.**—
Baird Hdwe. Co.
- JACKSONVILLE, FLA.**—
Florida Hdwe. Co.
Graybar Electric
Raybro Elect. Supp. Co.
- MIAMI BEACH, FLA.**—
Farrey Inc.
Farrey's Wholesale
- MIAMI, FLA.**—
Graybar Electric
McDonald Elect. Co.
Railey-Milan Co.
Raybro Elect. Supps. Inc.
- ORLANDO, FLA.**—
Graybar Electric
Robertson Supp. Co.
- PENSACOLA, FLA.**—
Lewis-Bear Co. Inc.
- ST. PETERSBURG, FLA.**—
Raybro Elect. Supps. Inc.
- TAMPA, FLA.**—
Graybar Elect.
Knight & Wall Co.
I. W. Phillips & Co.
Raybro Elect. Supps. Inc.
Spicola Hdwe. Co.
Louis Wohl & Sons
- W. PALM BEACH, FLA.**—
Palm Beach Merc. Co.
- ATLANTA, GA.**—
Beck & Gregg Hdwe. Co.
Elect. Sales & Serv. Co.
Georgia Appliance Co.
Sharp-Horsey Hdwe. Co.
- MACON, GA.**—
Peeler Hdwe. Co.
- SAVANNAH, GA.**—
Elect. Sales & Serv. Co.
Graybar Elect. Co.
Semmes Hdwe. Co.
- BOISE, IDAHO**—
Strevell Paterson Hdwe. Co.
- LEWISTON, IDAHO**—
Erb Hdwe. Co.
- CAIRO, ILL.**—
Woodward Hdwe. Co.
- CHICAGO, ILL.**—
Ace Hdwe. Co.
Benj. Allen Co.
Ball Co.
A. C. Becken Co.
Belknap & Thompson
The Grand Union Co.
Graybar Elect.
Hibbard Spencer Bartlett Co.
Marhar Trading Co.
H. Markham & Co.
A. C. McClurg & Co.
Nat'l Tea Co.
Revere Elect. Supp.
Sampson Elect. Co.
- Spiegel Inc.
Triangle Industries Corp.
- DANVILLE, ILL.**—
Conron Inc.
- DECATUR, ILL.**—
Crum Dist. Co.
- ELGIN, ILL.**—
Fox Elect. Supp. Co.
Muntz & Lea Co.
- FREEDPORT, ILL.**—
Koym Elect. Supp. Co.
- PEORIA, ILL.**—
Peoria Elect. Appl. Co.
Isaac Walker Hdwe. Co.
- QUINCY, ILL.**—
Gem City Elect. Co.
Tenk Hdwe. Co.
- ROCKFORD, ILL.**—
Muntz & Lea Co.
- SPRINGFIELD, ILL.**—
United States Elect. Co.
- CONNERSVILLE, IND.**—
Rodefeld Co.
- EVANSVILLE, IND.**—
Boetticher & Kellogg
- FORT WAYNE, IND.**—
Wayne Hdwe. Co.
- GREENSBURG, IND.**—
Rodefeld Co.
- INDIANAPOLIS, IND.**—
Peerless Elect. Supp. Co.
Rodefeld Co.
Van Camp Hdwe. & Iron Co.
- RICHMOND, IND.**—
Rodefeld Co.
- SOUTH BEND, IND.**—
Wayne Hdwe. Co.
- TERRE HAUTE, IND.**—
Hulman & Co.
- DES MOINES, IOWA**—
Luthe Hdwe. Co.
The G. W. Onthank Co.
- TOPEKA, KANS.**—
W. A. L. Thompson Hdwe. Co.
- WICHITA, KANS.**—
Federal Distg. Co.
- HARLAN, KY.**—
Kentucky Mine Supp. Co.
- LOUISVILLE, KY.**—
Belknap Hdwe. & Mfg. Co.
Cooper-Louisville Co.
Gleeson Jewelry Co.
Stratton & Terstegge Co.
- ALEXANDRIA, LA.**—
Brown Robert Hdwe. & Supp. Co.
- BATON ROUGE, LA.**—
Doherty Hdwe. Co.
- LAKE CHARLES, LA.**—
Murray-Brooks Hdwe. Co. Inc.
- MONROE, LA.**—
Monroe Auto. & Supp. Co., Inc.
Monroe Hdwe. Co.
- NEW ORLEANS, LA.**—
Stratton Baldwin Co.
- SHREVEPORT, LA.**—
Interstate Elect. Co.
- BANGOR, ME.**—
Dunham & Hanson
Rice & Miller
- LEWISTON, ME.**—
Hall & Knight Hdwe. Co.
- PORTLAND, ME.**—
Edward & Walker
Graybar Elect. Co.
- BALTIMORE, MD.**—
Columbia Wholesalers
- HAGERSTOWN, MD.**—
Schindel, Rohrer & Co.
Tristate Elect. Supp. Co.
- BOSTON, MASS.**—
I. Alberts Sons Inc.
J. H. Burke Co.
Decatur & Hopkins Co.
Grainger-Rush
Graybar Elect. Co.
E. H. Saxton Co.
- BROCKTON, MASS.**—
Columbia Elect. Supp. Co.
- GREENFIELD, MASS.**—
Tarbell & Watters Co.
- HOLYOKE, MASS.**—
J. Russell & Co.
- LOWELL, MASS.**—
Frank P. McCartin Co.
- NEW BEDFORD, MASS.**—
Elect. Serv. & Sales Co.
- PITTSFIELD, MASS.**—
Tarbell & Watters Co.
- QUINCY, MASS.**—
Granite City Elect. Supp. Co.
- SPRINGFIELD, MASS.**—
Graybar Elect. Co. Inc.
Chas. E. Hayes Co.
The Tarbell-Watters Co.
- WORCESTER, MASS.**—
Atlantic Elect. Supp. Co.
Graybar Elect. Co.
- McGRAW ELECTRIC CO.**
Elgin, Ill.
Electric Toasters
Distributor list not available
- PACKARD-BELL CO.**
3443 Wilshire Blvd.
Los Angeles 5, Cal.
Radio Receivers
Sales restricted to the
States West of the Rockies.
Factory representatives are
listed.
- SANTA BARBARA, CAL.**—
Clyde Wallichs
- SANTA ROSA, CALIF.**—
Norris C. Reakle
- PORTLAND, OREGON**—
Robert R. Reed
- SEATTLE, WASH.**—
E. K. Rogers Co.
- SPOKANE, WASH.**—
Walter H. Switzer
- TACOMA, WASH.**—
N. Earl Davison
- LOS ANGELES, CAL.**—
Yaras & Co. (Export)
- MOE-BRIDGES CORP.**
Sheboygan, Wisc.
Fluorescent & Incandescent
Lighting Fixtures.
Sells Direct; Territorial
Sales representatives are
listed.
- PHOENIX, ARIZ.**—
Mr. H. George Sheffer
- SAN FRANCISCO, CALIF.**—
E. R. Palmtag Co.
- DENVER, COLO.**—
Mr. Albert M. Solen
- TAMPA, FLA.**—
Mr. C. J. Brassell
- ATLANTA, GA.**—
Mr. J. B. Morrison
- CHICAGO, ILL.**—
George Richards & Co.
- NEW ORLEANS, LA.**—
Mr. M. Morin Rivers
- BALTIMORE, MD.**—
Eastern Sales Agency, Inc.
- BOSTON, MASS.**—
Mr. Joseph Victor
- DETROIT, MICH.**—
Mr. H. D. Robertson
- KANSAS CITY, MO.**—
Wm. (Bill) Terry Organiza-
tion
- NEW YORK, N. Y.**—
Mr. Henry Froelich
- RALEIGH, N. C.**—
Virginia-Carolina Elect.
Sales Co.
- PHILADELPHIA, PA.**—
Mr. Howard L. Huzster
- DALLAS, TEXAS.**—
Galvin Sales Co.
- HOUSTON, TEXAS.**—
Mr. Dallas L. Calmes
- SEATTLE, WASH.**—
Jas. J. Backer Co.
- MADISON, WIS.**—
Mr. E. F. Miller
- SETCHELL CARLSON, Inc.**
2233 University Ave.,
St. Paul, Minn.
Radios, Sound Systems,
Fluorescent Fixtures
Distributor list not
available
- ZENITH RADIO CORP.**
6001 Dickens Ave., Chicago
18, Ill.
Radios, Hearing Aid
Devices
Distributor list not
available



A New Jensen Coaxial

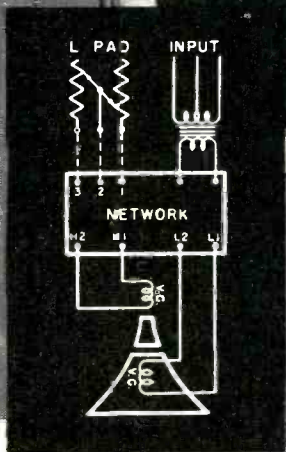
TYPE H

WITH *Compression-type* HIGH-FREQUENCY SPEAKER

The first of a new series of JENSEN Coaxial Speakers, combining in one coaxial assembly a horn-type high-frequency speaker with a cone-type low-frequency unit. By unique design, the cone of the low-frequency unit forms a part of the high-frequency horn, thereby dispensing with a separate horn. An integral two-channel network gives the desired crossover characteristics. Thus this new Coaxial Speaker provides the quality of reproduction so essential and desirable for radio receivers and phonographs for home entertainment, particularly for FM reception and high quality phonograph recordings.

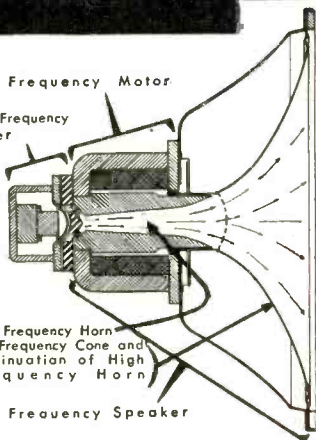
The distribution characteristics of the Type H Coaxial are excellent and, when installed in a suitable enclosure such as a Bass Reflex cabinet, its performance covers the entire frequency range useful in home reproduction.*

Type H Coaxial, illustrated here with field coil low-frequency speaker and *ALNICO 5* high-frequency unit, is designed for manufacturers. Other models for more general use, incorporating *ALNICO 5* design in both high-frequency and low-frequency units, will shortly be announced.



Low Frequency Motor

High Frequency Driver



High Frequency Horn
Low Frequency Cone and
Continuation of High
Frequency Horn

Low Frequency Speaker

TYPE H SPECIFICATIONS

Power rating 25 watts maximum, in speech and music systems. Input impedance 16 ohms. Field 14-20 watts. List price approximately \$100.00.

*See No. 3 JENSEN Monograph: "Frequency Range in Music Reproduction," for discussion of useful frequency ranges.

Other Coaxials Now Available!



These Type J Coaxials, improved over prewar design, offer low-cost Coaxial performance in home radio receiver and phonograph entertainment.

JAP-60 (1.5-inch) with HF Control Switch. List price **\$79.45**

JHP-52 (1.5-inch) with HF Control Switch. List price **\$36.15**

JCP-40 (1.2-inch) HF Level Control extra. List price **\$33.45**



Jensen

SPEAKERS WITH

ALNICO 5

JENSEN RADIO MANUFACTURING COMPANY • 6615 S. LARAMIE AVE. • CHICAGO 38, ILLINOIS
IN CANADA - COPPER WIRE PRODUCTS, LTD. • 137 OXFORD STREET, GUELPH, ONTARIO

Specialists in Design and Manufacture of Fine Acoustic Equipment

In Trade

[from page 20]

Manager of Radio Wire Television Inc. (Lafayette Radio) of New York, having just completed four years of active duty in the U. S. Navy where he held the rate of Aviation Radio Technician First Class.

New I.R.E. Officers

Dr. Frederick B. Llewellyn, of Summit, N. J., has been elected President of the Institute of Radio Engineers for the year 1946, the Board of Directors of that society announced. He

succeeds Dr. William L. Everitt, head of the Department of Electrical Engineering of the University of Illinois.

Dr. Llewellyn, a consulting engineer on the staff of Bell Telephone Laboratories, is an international authority on the design of vacuum tubes used for communication and electronic control purposes. His theoretical study of the subject resulted in his invention of the ultra-high-frequency oscillator tube which is fundamental to the development carried on during the war in radar and other communication devices.

Elected with Dr. Llewellyn, as Vice President, was E. M. Deloraine, President of the International Telecommuni-

cation Laboratories, New York, and well known in engineering circles in this country and in Europe. Three directors were also elected: Dr. Walter R. G. Baker, Vice President of General Electric Company, Syracuse, N. Y.; Dr. Donald B. Sinclair, Assistant Chief Engineer of General Radio Company, Cambridge, Mass.; and Virgil M. Graham, Plant Manager of Sylvania Electric Products, Inc., Williamsport, Pa. Installation will take place in January at the annual meeting, which is to be held the first day of the Winter Technical Meeting at the Hotel Astor.



**BROAD RANGE SELECTION
IN A POCKET-SIZE INSTRUMENT**

WESTON
MODEL 564—TYPE 3-C
VOLT-OHMMETER

An extremely compact WESTON quality instrument with a broad selection of resistance and DC voltage ranges. Ranges available from pin-jacks molded internally with the panel, a toggle-switch connecting meter in circuit as a Voltmeter or Ohmmeter. Readily adjusted for variations in battery potential. For full details on Model 564, and on WESTON Ohmmeters and Volt-Ohm-Milliammeters, send for literature. Weston Electrical Instrument Corporation, 605 Frelinghuysen Avenue, Newark 5, New Jersey.

WESTON Instruments



George A. Boden, recently elected vice-president in charge of home radio sales by Detrola Radio Div. of International Detrola Corp.

Nationwide Television Planned

Airplanes cruising constantly six miles in the air will provide nationwide television and FM radio programs for even the remotest rural sections under the recently announced system of Stratovision developed by Westinghouse and The Glenn L. Martin Company. Happy engineering phenomenon which aids Stratovision is the fact that as antenna elevation is increased, power required to deliver the same usable signal to a given area is sharply reduced.

Philco Line to Olson

Olson Radio Warehouse, 73 E. Mill Street, Akron, Ohio, has been appointed distributors by Philco for their line of Philco auto radios, batteries, tubes and office inter-communication

[see page 64]

Sell the make all homes know best!



RADIO TUBES

GET OFF to a fast start by selling G-E radio tubes. Every home-owner knows and respects the famous G-E monogram—gives a friendly welcome to products bearing that symbol. G-E radios, lamps, refrigerators, and other appliances—one or more are sure to be in dependable daily use, building preference for tubes made by General Electric.

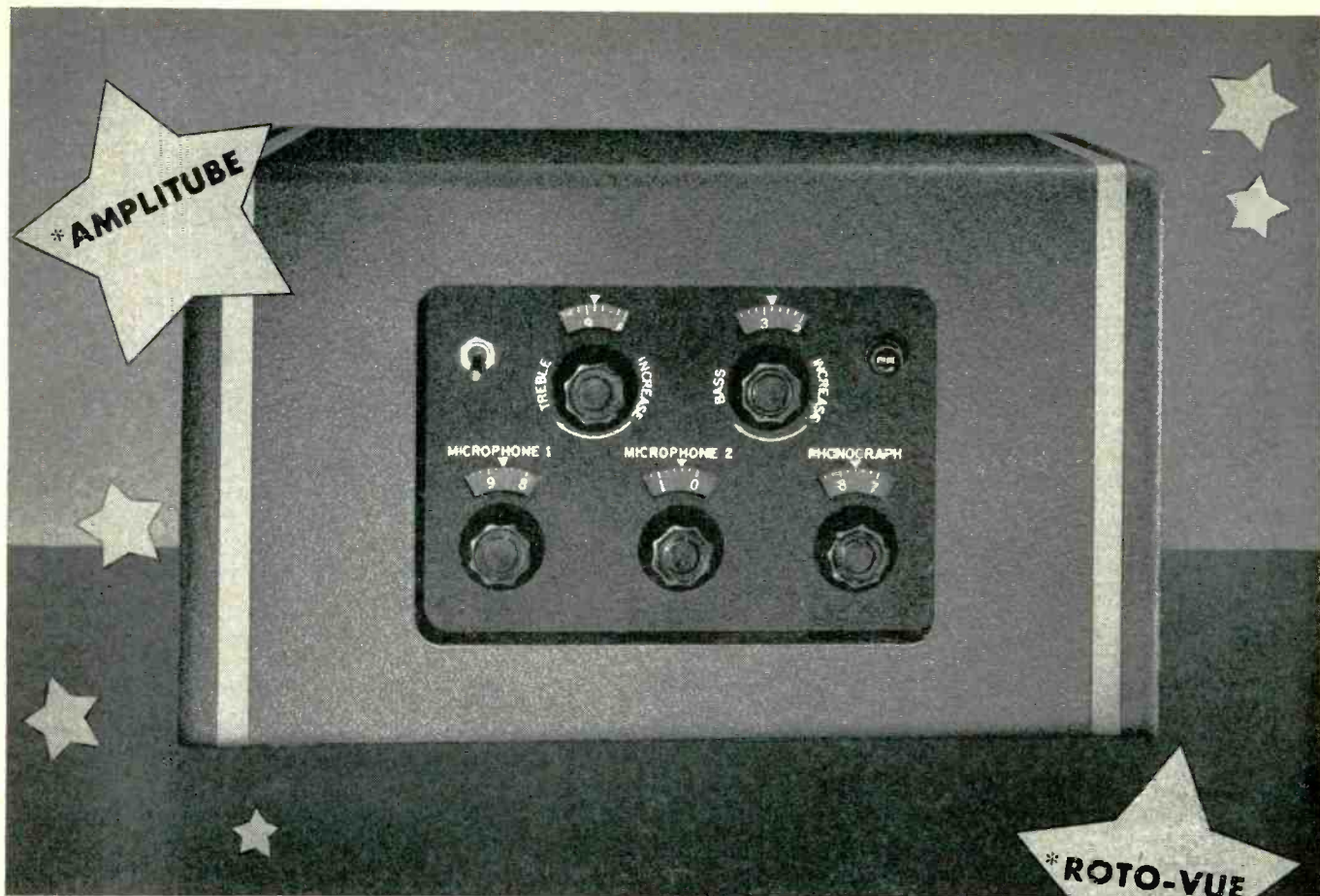
● G-E radio tubes are advertised in national magazines with a total circulation of 30,000,000; also over the air to 7,000,000 radio homes. User preference plus strong advertising make the G-E tube franchise a top profit-producer. Investigate this opportunity. Write for information about G-E tube selling rights to *Electronics Department, General Electric Company, Schenectady 5, N. Y.*



Hear the G-E radio programs: "The World Today" news, Monday through Friday, CBS. "The G-E All-Girl Orchestra," Sunday, NBC. "The G-E House Party," Monday through Friday, CBS.

GENERAL ELECTRIC

176-D6-8850



***AMPLITUDE**

***ROTO-VUE**

Ethical Engineering is the Basis of

Eastern's 21 STAR FEATURES

***UNICABLE**



Ethical engineering at Eastern is the history of many years in the service of sound amplification. The 21 Star Features are the result of intensive experience dating back to the early days of radio—the pioneer 20s! Today this engineering background accounts for the many innovations we have designed for the new 1946 Eastern Amplifiers—the 21 Star Features that produce Eastern's

famous *Quality Performance*. No other amplifiers, regardless of price, incorporate so many novel and useful features. . . . For complete information and price list—for the first edition of our 1946 Catalog—write today! . . . Eastern Amplifier Corporation, 794 East 140th Street, New York 54, N. Y. Dept 12C

RECESSED CONTROLS

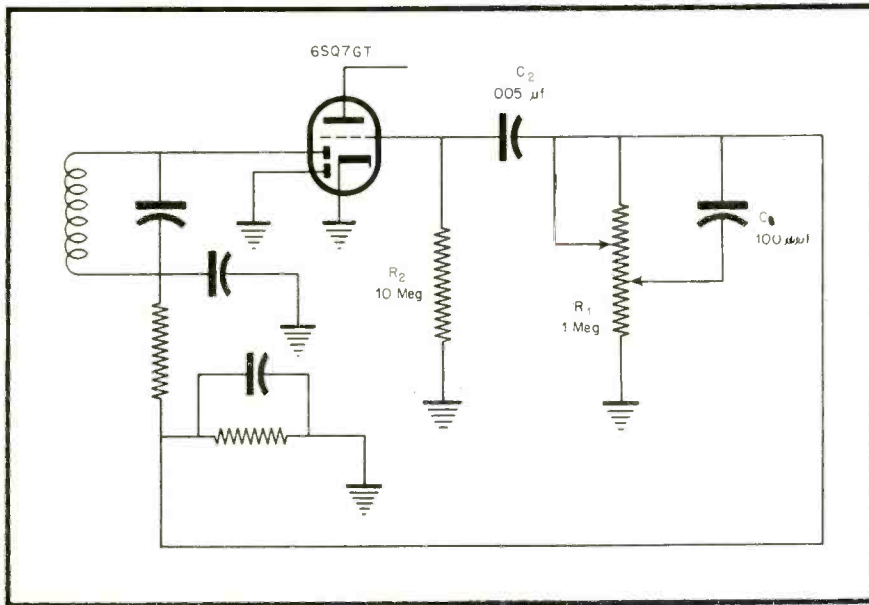
CODED CABLE

EASTERN   **AMPLIFIERS**

*U.S. Reg'n Applied For.

Circuit Court

[from page 47]



the i-f trap in the r-f stage is illustrated in Fig. 4. This circuit is employed in the Emerson Models GA-439 and GA-441, chassis GA, and GA1.

As shown, the 6SQ7 r-f amplifier

tube is resistance-coupled to the converter. The i-f trap is formed by the series-resonant circuit L1-C1 and should be tuned to produce *minimum* response at the intermediate frequency

employed in these receivers, 455 kc. The i-f signal should be fed to the external antenna connection when making this adjustment, not to the signal grid of the 6SA7.

COMBINATION TONE AND VOLUME CONTROL

A simple method of combining the tone and volume control in a single unit is employed in the Pilot Model 330 receiver. As illustrated in Fig. 5, the potentiometer R1 has two moving arms, one of which controls the audio signal input to the grid of the 6SQ7GT amplifier section, and the other varies the shunting effect of the tone control condenser C1 across the volume control. Because the volume control has a relatively high resistance, 1 megohm, C1 needs to be only 100 mmf to give adequate tone control.

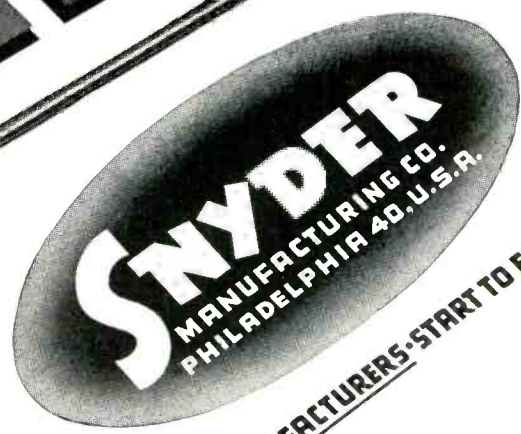
In making replacements of this control it is important that the same type used in the original receiver be employed in order to assure proper operation. If a control which differs greatly in taper or resistance from that specified is substituted, the results will not be satisfactory.

GAS GATE

An interesting and unusual circuit designed to counteract the effects of gas [see next page]

AUTOMOBILES ↗
HOMES ↗
BOATS ↗
HANDY TALKIES ↗

ANTENNAS



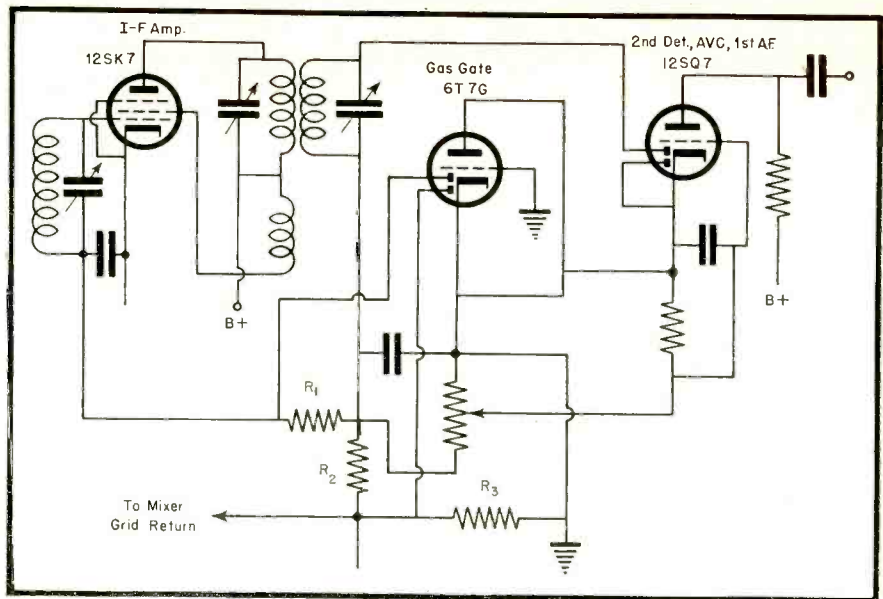
MANUFACTURERS - START TO FINISH

[from previous page]

current in i-f amplifiers is illustrated in Fig. 6. The duo-diode triode 6T7G is employed as a so-called "gas gate". The manner in which this circuit functions may be explained as follows: When grid current flows in the 12SK7 i-f amplifier circuit, whether from gas or other causes, a voltage drop develops across R1 in such direction that it tends to oppose the a-c voltage, resulting from signal rectification in the 12SQ7 diode circuit. Because the 6T7 section forms a low resistance circuit when this condition occurs, it tends to minimize the effects of gas current in the 12SK7. The second diode section of the 6T7G performs the same function for the mixer tube by neutralizing the voltage drop across R3.

This circuit is employed in the Montgomery Ward 14BR-734A-735A and 736A chassis.

On right is Figure 6



In Trade

[from page 60]

sets. Territory to be covered by Olson Radio Warehouse is unrestricted and therefore they will accept orders for these Philco products from dealers in every state in this country as well as foreign countries.

Irving J. Olson, Sales Manager, has suggested that all dealers interested in these particular Philco products, write to the home office in Akron in order to get lined up for future deliveries.

Crosley Promotes Mahan

R. C. Cosgrove, vice-president of The Crosley Corporation, has announced the elevation of S. D. Mahan, to vice-president and general sales manager of the manufacturing division.

Mr. Mahan came to Crosley in 1943 after spending two and one half years with the U. S. Treasury Department as director of advertising and promotion for the War Bond program. Prior to that Mr. Mahan spent over eight years in the electrical appliance field as general advertising manager of the Westinghouse Electric Co.

Garod AM

Joseph G. DeVico has been appointed advertising manager of the Garod Electronics Corporation, Brooklyn, N. Y., according to an announcement from Louis Silver, sales manager. Recently released to inactive duty in the Supply Corps, U. S. Naval Reserve, DeVico was formerly in the radio industry serving as an advertising counsellor. Garod is currently releasing a nationwide consumer and industry promotional campaign for their post-war radio and electronic products.

[continued on page 66]

Silent Night

Season's Greetings to Masco jobbers and dealers
and to all our friends in the industry

SILENT NIGHT

No night service calls for Masco jobbers and dealers! The superbly dependable performance of Masco sound equipment lets them sleep at night... knowing that their repeat business from satisfied customers is assured.

MARK SIMPSON MANUFACTURING CO.
MANUFACTURERS OF
Masco Sound Systems and Accessories
186-194 WEST FOURTH STREET :: NEW YORK 14, N. Y.
Telephone CHelsea 2-7112-3-4

KEN-RAD

CATHODE-RAY TUBES



*Better
than ever*

► Our great new age of television will owe much to the picture-sharpness and realism offered by Ken-Rad Cathode-Ray Tubes . . . Added facilities for research, testing, and production promise still finer tube performance . . . Tomorrow's big market for Ken-Rad television tubes is but *one of many* profit opportunities for Ken-Rad dealers.

✕
● Write for your copy of
"Essential Characteristics"
the most complete digest of
tube information available

178-D15-8850

KEN-RAD

DIVISION OF GENERAL ELECTRIC COMPANY

OWENSBORO, KENTUCKY

In Trade

[from page 64]

Scott Dealers

Scott Radio Laboratories, Inc., Chicago, names new franchised dealers to serve old and new customers alike who are located outside of their principal branch offices at Chicago, New York and Los Angeles. More than one hundred retail establishments, in key metropolitan centers will merchandise, service and install Scott instruments. Formerly, customers had to order their instruments by mail.



Jack T. Dalton, recently appointed manager of distribution for radio and television by Bendix Radio Div.

Hallicrafter Ups Maher

William R. (Red) Maher has taken over new duties at the Hallicrafters Company, producers of high frequency radio equipment, as an assistant sales manager, according to R. J. Sherwood, sales manager.

Utah Parts Catalog

Utah Radio Products, a Division of International Detrola Corporation, announces the expansion of its transformer division, particularly in the jobber and industrial fields. The number of types of transformers available from stock will now be more than double that before the war.

Besides adding many new models to their post-war line, Utah has now established a special transformer division to manufacture special type transformers for specific applications. Included will be hermetically sealed types as well the new hypersil transformers which its engineers helped to develop during the war.

A new 1946 radio parts catalog covering the complete line of transformers not only for radio sets but for public address equipment, radio transmitting equipment, and other industrial uses, will be available shortly after January 1. Address the company, at 810 Orleans St., Chicago 10, Ill.

Westinghouse Appoints

J. R. Weaver, manager of the East Springfield plant of the Westinghouse Electric Appliance Division, announces appointment of Paul W. Kohler as manager of advertising and sales promotion.

Air Express Deliveries

Walker-Jimieson, Radio and Electronic distributors at 311 South Western Ave. in Chicago, has long been known as the "Emergency Service Distributor." For several years they have successfully maintained and continued to build their reputation of supplying electronic parts and equipment to Industrial plants with the greatest possible speed. Now, as a special contribution to the hastening of victory, Walker-Jimieson is encouraging its customers to request shipment by Air Express and is paying one-half the air express charges on each shipment of 3 lbs. or less.

Raytheon Tubes

In response to many inquiries, Carl J. Hollatz, of Raytheon Manufacturing Co., stated that the company is rapidly reconverting and expects to have its full line of radio receiving tubes for

[see page 68]

BRIGHTER LIGHT for Service Jobs!

NEW, IMPROVED

IDEAL Rechargeable Flashlight STORAGE BATTERY

More and more radio servicemen are using IDEAL Rechargeable Storage Batteries for Flashlights because they are sure of a brighter, better light at all times, simply by recharging regularly from any handy electrical outlet. Economical too, one IDEAL battery can replace up to 400 or more dry cells. Fits any standard flashlight case using two or more 1 1/4" size D dry cells. Recent improvements give the IDEAL Storage Battery 40% greater discharge capacity.

IDEAL Battery Charger lasts for years. Available in single, six and twelve gang sizes.

GUARANTEED



PROMPT DELIVERY

Write for Bulletin
BB 345

IDEAL Sycamore

Storage Battery Division

IDEAL COMMUTATOR DRESSER CO.

5104 Park Ave., Sycamore Ill.

Sales offices in all principal cities

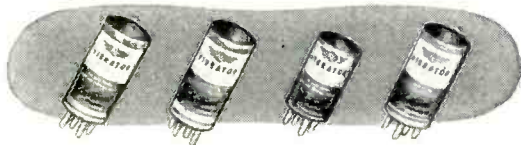
E·L

AUTO RADIO VIBRATORS LAST 33% LONGER, RUN LIKE NEW "ALL THE WAY"!

E·L Auto-Radio Vibrators give you and your customers, for the first time, the benefits of important advances in vibrators made by E·L for vital war applications.

These precision-built, top quality synchronous and non-synchronous vibrators, developed and perfected by E·L for the armed forces, are of the balanced resonance type with 8 contacts—twice as many as other makes in the non-synchronous types. These features, combined with a "quick-make, quick-break" action of the contacts, makes them last 33% longer and operate more efficiently and quietly. Their output-voltage and starting-voltage requirements are held virtually constant throughout the entire life-span.

4 MODELS MEET 95%
OF ALL AUTO-RADIO
REPLACEMENT NEEDS!



Only 4 models of E·L Vibrators (models 1703, 2089, 2041 and 2088) to service the 1,122 auto-radio models which comprise 95% of the market. Smaller inventory, faster turnover, larger profits for both distributors and dealers! E·L's standardization plan is the most comprehensive ever offered in auto-radio vibrators! Order now from your distributor, and get the wall chart telling which E·L Vibrator to use for most makes and models of auto-radios as far back as 1936.

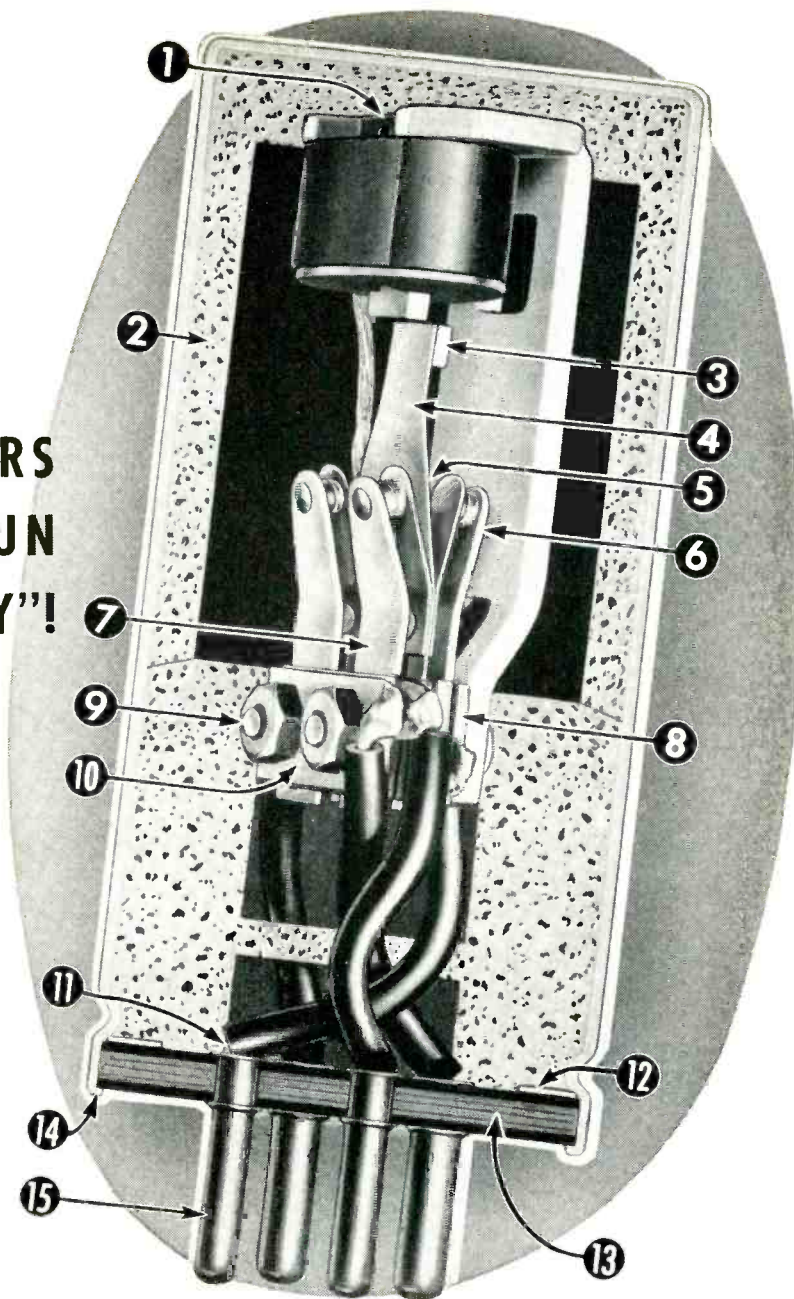


**Auto Radio
VIBRATORS**

Electronic

LABORATORIES, INC.
INDIANAPOLIS

VIBRATORS AND VIBRATOR POWER EQUIPMENT FOR LIGHTING, COMMUNICATIONS, ELECTRIC AND ELECTRONIC APPLICATIONS



E·L AUTO-RADIO VIBRATORS BUILT FOR LONG SERVICE

1. Welded pole piece assures permanent accuracy of adjustment.
2. Synthetic sponge sound insulation molded to fit contour of vibrator.
3. Face of center reed weight is surface-ground to improve magnetic coupling.
4. Center reed uniformly stressed to prevent breakage.
5. Reed and side contact arms are specially tempered.
6. Side contact arms are silver-plated to prevent corrosion.
7. Spot-welding of fingers, in contact against each other and the center reed, reduces voltage drop in center-reed assembly.
8. Accurately ground bakelite spacers give structural accuracy and dimensional stability.
9. Double-screw stack helps maintain accurate adjustment.
10. Pressure plate on top of stack keeps stack tight under tension over wide ranges of temperature.
11. Extra-flexible roped wire used as leads to avoid any possibility of breakage.
12. Steel ring, molded into shock mount, centers and holds vibrator upright when can is sealed.
13. Neoprene wafer in hermetically sealed vibrators effectively seals vibrator against atmospheric pressure changes and moisture.
14. Metal can, spun at bottom, seals vibrator against dust and dirt.
15. Silver-plated pins assure minimum contact resistance.

COPYRIGHT 1945 ELECTRONIC LABORATORIES, INC.

In Trade
[from page 66]

civilian use available around January 1, 1946.



J. J. Clune, recently appointed Sales Manager of National Union's Distributor Div.

Electronic Laboratories' New Jobbers

Walter E. Peek, vice president and sales manager of the Electronic Laboratories Inc. of Indianapolis, Indiana, announced that the following new jobbers will distribute the company's auto radio vibrator replacement lines: Radio Wire Television Inc., Boston,

Mass.; Radio Products Sales, Denver, Colorado; Radio Electric Products, Buffalo, N. Y.; Radio Products Sales, Los Angeles, Cal.; Scott Radio Supply, Long Beach, Cal.; Hatry and Young, Hartford, Conn.; Roehr Distributing Company, St. Louis, Mo.; R. and R. Part and Supply Company, Inc., Lubbock, Tex.; and Central Missouri Distributing Company, Jefferson City, Mo.

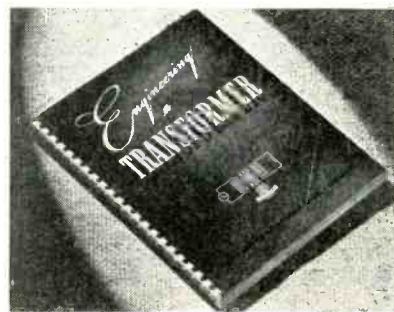


Harold D. Desfor, newly appointed Publicity Director for the RCA-Victor Div.

New Stancor Brochure

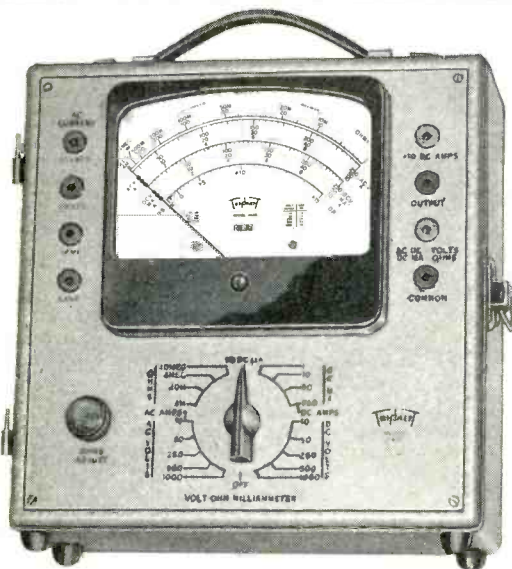
Standard Transformer Corporation offers free an 88-page brochure, "Engineering a Transformer," to readers who request a copy. Subjects covered

include lamination size, grade, gauge and magnetic performance; wire size, type and gauge; winding design; transformer-reactor physical and electrical aspects; electrical-mechanical considerations of core laminations; impregnation, assembling and casing; potting and sealing.



Those wishing to delve deeper into the principles of transformer construction and design will find a highly-informative 40-page technical section. Beginning with a historical discussion, subdivisions include definitions and nomenclature; transformer and reactor cores; core designs; coils for small transformers and reactors; winding and lamination data charts; conductor and insulation selection; winding, lamination and coil data; power trans-

[see page 71]



**NEW ENGINEERING • NEW DESIGN • NEW RANGES
50 RANGES**

- Voltage: 5 D.C. 0-10-50-250-500-1000 at 25000 ohms per volt.
- 5 A.C. 0-10-50-250-500-1000 at 1000 ohms per volt.
- Current: 4 A.C. 0-.5-1-5-10 amp.
- 6 D.C. 0-50 microamperes—0-1-10-50-250 milliamperes—0-10 amperes.
- 4 Resistance 0-4000-40,000 ohms—4-40 megohms.
- 6 Decibel -10 to +15, +29, +43, +49, +55
- Output Condenser in series with A.C. volt ranges.

Model 2400 is similar but has D.C. volts Ranges at 5000 ohms per volt.

Write for complete description

MODEL 2405

Volt-Ohm-Milliammeter

25,000 OHMS PER VOLT D.C.



SPECIFICATIONS

NEW "SQUARE LINE" metal case, attractive tan "hammered" baked-on enamel, brown trim.

- PLUG-IN RECTIFIER—replacement in case of overloading is as simple as changing radio tube.
- READABILITY—the most readable of all Volt-Ohm-Milliammeter scales—5.6 inches long at top arc.
- RED-DOT LIFETIME GUARANTEE on 6" instrument protects against defects in workmanship and material.

Triplet
ELECTRICAL INSTRUMENT CO.

BLUFFTON, OHIO.

<i>Sun.</i>	<i>Mon.</i>	<i>Tue.</i>	<i>Wed.</i>	<i>Thu.</i>	<i>Fri.</i>	<i>Sat.</i>
					4	5
6						12
13						19
20	21			31		26
27	28	29	30			

**Every Day, Every
Month, Every Year**

RACON SPEAKERS

**Are Preferred By
Sound Experts**



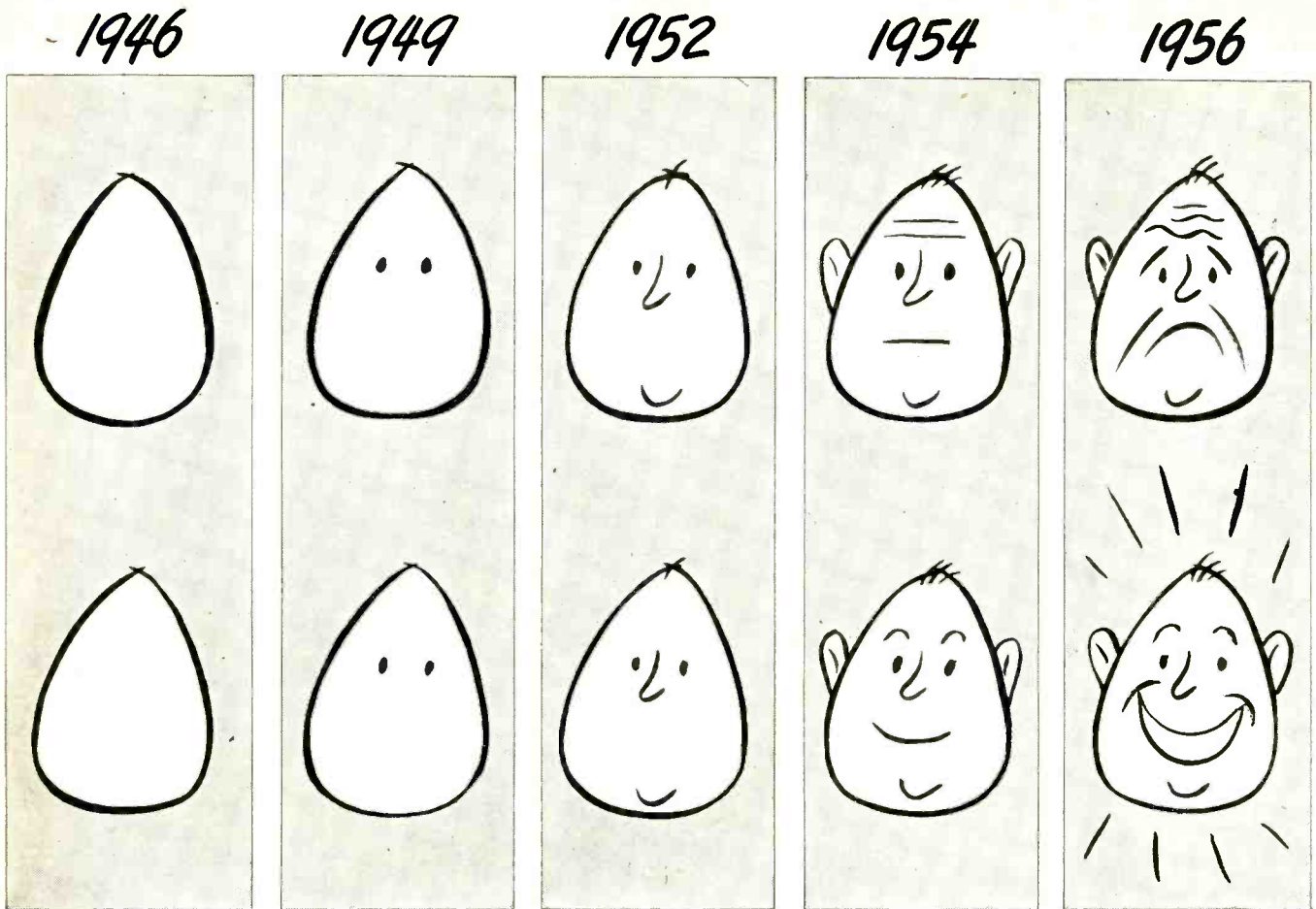
The RACON Marine Horn Speaker is used both as a loudspeaker and as a microphone. Approved by the U. S. Coast Guard for all emergency loudspeaker systems on ships. A double re-entrant type speaker, completely waterproofed and weatherproof. Ideal for general P.A. and Marine use. Several sizes available. RACON Permanent Magnet Horn Units are available in operating capacities of from 10 to 50 watts.

In judging the value of sound reproduction equipment, the month-after-month, year-after-year dependability and efficiency of loudspeakers are prime considerations along with fidelity, output and initial cost.

RACON has never compromised with quality. RACON Speakers and Driving Units are recognized as the standards by which other loudspeakers are judged. RACONS are used on U. S. Army Transport and Navy vessels — by other branches of the Military — in factories, schools, auditoria, shipyards, etc. RACONS are available for every conceivable application. Specify RACON when planning your next sound or public address installation

RACON ELECTRIC CO., 52 East 19th St., New York, N. Y.

RACON



Two ways your face can grow in the next few years

USUALLY, our faces show what's happening to us. For instance, suppose financial matters are constantly on your mind.

Suppose you know that there's practically no cash reserve between you and trouble.

It would be surprising if your face didn't show it.

But suppose that, on the contrary, you've managed to get yourself on a pretty sound financial basis.

Suppose that you're putting aside part of everything

you earn . . . that those dollars you save are busy earning *extra* dollars for you . . . that you have a nest egg and an emergency fund.

Naturally, your face will show *that*, too.

There's a simple and pretty accurate way to tell which way your face is going to go in the next few years:

If you are buying, regularly, and holding as many U. S. Savings Bonds as you can, you needn't worry.

Your face will be among the ones that wear a smile.

Buy all the Bonds you can... keep all the Bonds you buy

RADIO SERVICE DEALER

This is an official U. S. Treasury advertisement—prepared under auspices of Treasury Department and War Advertising Council

In Trade

[from page 68]

former design procedure and procedure chart; audio transformer frequency response test methods; reactor design; electrical and production testing.

Technicians will appreciate the clear-cut information of this section, invaluable in the approximation of transformer or reactor final design.

Sonora Dealer Franchises

Franchises to leading dealers in the Chicago area are now being effected by Walker-Jimieson, Inc., Chicago distributor of Sonora radios. The post-war Sonora line will consist of 37 different models including television, radio-phonograph combinations and FM-AM sets in an attractive array of modernistic cabinets. These sets will be competitively priced, nationally and locally advertised and supported by point-of-sale advertising aids.

New Johnson Products

The E. F. Johnson Company, Waseca, Minnesota, announces that it has acquired all tools, inventory and manufacturing rights for the cable connectors, pilot and dial light assemblies, tip plugs and tip jacks, which were formerly Mallory-Yaxley products. These items have been added to the Johnson line of variable condensers, tube sockets, insulators, inductors, plugs and jacks and in the future will be manufactured and sold solely by Johnson.



E. P. (Pat) Toal, newly appointed Sales Manager of standard radio receivers by the General Electric Company.

Promoted at Galvin

The Galvin Manufacturing Corporation, makers of Motorola Radios and Radio telephones, has announced the appointment of E. S. Goebel as acting director of field sales in the communications and Electronics Division. This is the field in which Galvin has

[see page 72]

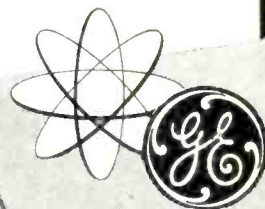
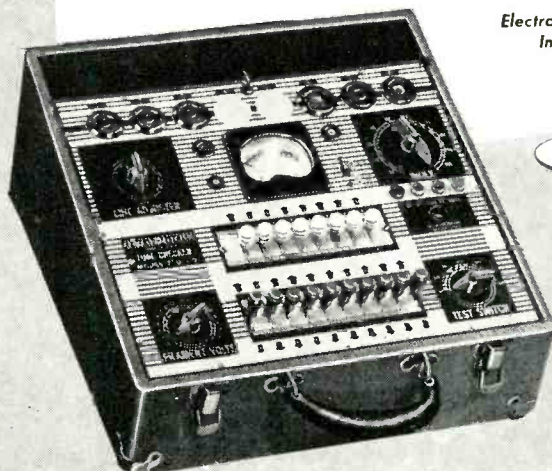
G-E TUBE CHECKER

Quick, easy, accurate tube checking which saves you time and trouble and keeps your customers happy—that's the job the TC-3P is built to do. Line Voltage and tube quality, or shorts, may all be checked on one selector switch. Individually operated switches permit placing the proper voltage on the proper pin of the tube. The G-E Tube Checker is available in either the Portable (TC-3P) or Counter Model (TC-3). Write: Specialty Division, Electronics Department, General Electric Company, Syracuse, New York.

GENERAL ELECTRIC

177-D1

Electronic Measuring
Instruments



TC-3P

AUTO ANTENNAS Designed for LEADERSHIP

Leaders in the auto antenna field for over a decade, JFD offers for prompt shipment auto antennas with these advantages:

1. Seamless Admiralty Brass Tubing
2. High-Polished Chromium Plating
3. Stainless Steel "Snap Back" Top Rod
4. Heavily Insulated Shielded Loom Lead
5. 100% Low Loss Construction

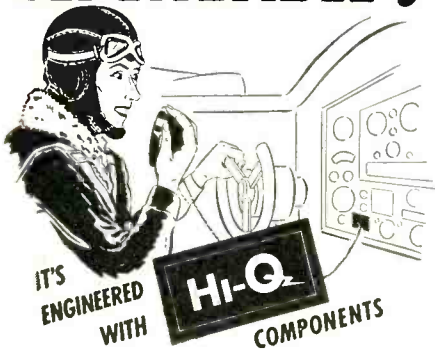
Eight Fast Selling Sizes and Types

Write for FREE literature # 344

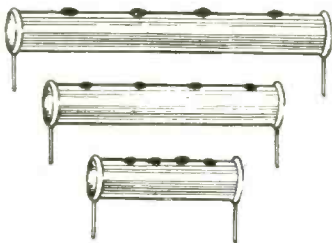
J. F. D. Manufacturing Co.
4111 Ft. Hamilton Parkway,
Brooklyn 19, N. Y.



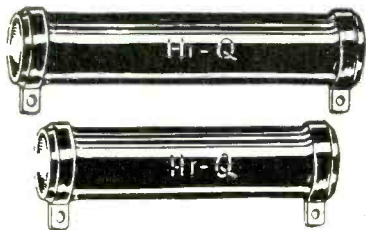
DEPENDABLE!



Made right . . . to work right . . . and stay right. Whether in stock ratings or to your own specifications you will find Hi-Q components precise, dependable and long lived. Send for samples and complete information.



Hi-Q Ceramic Capacitors are of titanium dioxide (for temperature compensating types) and are tested for physical dimensions, temperature co-efficient, power factor and dielectric strength. CI type with axial leads; CN type with parallel leads.



Hi-Q Wire Wound Resistors can be produced promptly and in quantity — with quality physical specifications and high performance electric specifications.



Hi-Q Choke Coils are uniform in their high quality performance. Ruggedly constructed for long service.

ELECTRICAL REACTANCE CORPORATION
FRANKLINVILLE, N. Y.

In Trade

[from page 71]

made such remarkable strides in the pioneering of two-and-three-way radiotelephone in such new applications as: pipe-line maintenance, bus and truck transportation, power line maintenance and other industrial communication uses. It also comprises the railroad-radio field and emergency police and fire department radio. Mr. Goebel will be in direct charge of the activities of all field salesmen. Norman Wunderlich resigned as Sales Manager effective July 1.

Karet Joins Maguire

Consolidation and coordination of the sales activities of several subsidiaries of Maguire Industries, Inc., was effected by the appointment of Robert M. Karet as manager of the newly-created electronic distributor and industrial sales department of the company. Oden F. Jester is general sales manager of the radio and electronic division.



R. J. (Bob) Karet

Under Mr. Karet's direction, all distributor and industrial sales of Maguire subsidiaries serving the electronic field will be coordinated, Mr. Jester said. At present, these subsidiaries include the Meissner Mfg. Div., Mt. Carmel, Ill., Thordarson Electric Mfg. Div., Chicago, both of which were purchased by Maguire Industries this past summer, and the Radiart Div., Cleveland, Ohio, purchase of which by Maguire was announced on November 5.

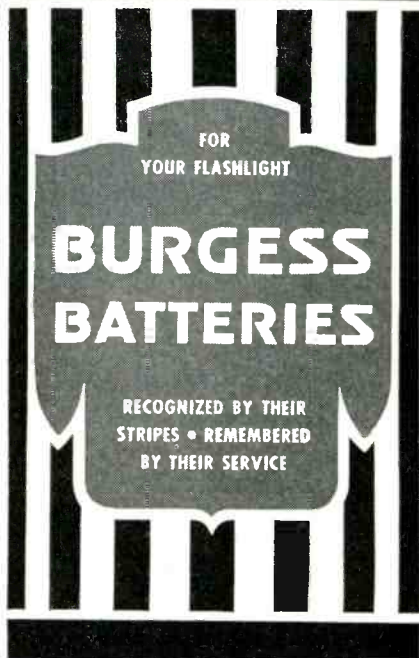
Mr. Karet was associated with Utah Radio Products Co. for the past 10 years. Before joining Utah, he was for four years sales manager of the

[see page 73]

THIS EYE-CATCHING BURGESS CAMPAIGN

makes 16,000,000 favorable impressions and sells batteries to readers of *The Saturday Evening Post*, *Liberty*, *Outdoor Life* and 21 other favorite magazines!

says
HOMER G. SNOOPSHAW



In Trade
[from page 72]

Radiart Corporation, Cleveland. Mr. Karet will make his headquarters in the Chicago office of Maguire Industries, Inc., at 936 North Michigan Avenue.

Balsam Now Aerovox A.M.

The appointment of George Balsam as Advertising Manager and Director of Sales Promotion is announced by Aerovox Corporation of New Bedford,

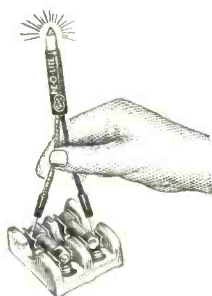


George Balsam

ford, Mass. Mr. Balsam comes to his new post with an extensive advertising and sales promotion background gained mainly as account executive with Rickard and Company and O. S. Tyson & Company, the New York advertising agencies, where he specialized in technical accounts.

Tester

The improved all-purpose Ne-O-Lite Electric Test-Lite, now retails at a new low price of 50¢. It is a handy, inexpensive, trouble shooter, ideal for testing electric appliances, locating blown fuses, testing A. C.



Lines, polarity of A. C. or D. C., tracing ground line in A. C. circuits, as a radio frequency indicator, etc. Glow of neon lamp instantly tells if circuit is broken. Tests voltages from 60 volts A. C. to 550 volts A. C. or D. C. by variable light intensity. An attractive

[see page 74]

Adaptol PHONO-RADIO
MATCHING UNIT

BOON FOR SERVICERS! A time-saver and moneymaker that just had to come . . . fruit of ADAPTOL initiative and research, supported by technical help from your own profession.

HOW SIMPLE! Without removing anything from either housing . . . without even breaking a circuit . . . you can install this long-wanted convenience wherever there is a radio to be utilized for reproducing record entertainment!

THINK OF THE technical data you DO NOT have to wade through! And the time you can save! And the satisfaction for your customers, while you are making a nice profit and adding to your professional prestige!

ANY
RECORD
PLAYER

ADAPTOL
supplies the
MISSING LINK

write
QUICK
for the
WHOLE STORY

ANY
RADIO

ADAPTOL COMPANY

260 Utica Avenue, Brooklyn 13, New York

Tone...
Always a Deciding Factor

In the selection of any musical instrument, tone is of vital importance. Cinaudagraph Speaker Engineers have kept pace with every tone advancement — pioneered many new developments. That's why you'll want tomorrow's better than ever, Cinaudagraph Speakers in every fine receiver — every quality sound unit.

Cinaudagraph Speakers, Inc.
3911 S. Michigan Ave., Chicago
Export Div., 13 E. 40th St., New York 16, N. Y.

"No Finer Speaker in all the World"

SPEED UP REPAIRS WITH THESE G-C AIDS!

FREE
STEEL
CABINET



G-C Dial Belt Kits

Every Serviceman needs a G-C Dial Belt Kit. Save money—be ready for that repair job. Finest woven fabric replacements. Easy to install—no stretch—no adjustments. Supplied in kits of 25, 50, 100, 200 or 300 Belts in sturdy metal box with slide-in drawer. Free Belt Guide and measuring device.



G-C Dial Drive Cables

G-C has a complete line of Dial Drive replacement cables. Available by the spool for prompt servicing of all sets. Every Serviceman should have a complete assortment. Best quality—extra strength. Preferred by Radio Men everywhere.

G-C Radio Service Cement



The best cement for Speaker and Radio Work. Especially suitable for cementing replacement cones and repairing rattling cones and torn cones. Also used on glass, to seal adjustments, hold wires in place, etc. Dependable, vibration proof, water-proof and fast drying.

Write for New G-C Catalog No. 146 and G-C Dial Belt and Service Book

Immediate Delivery on all G-C Products

Order From Your Radio Parts Jobber
ALWAYS ASK FOR G-C PRODUCTS



GENERAL CEMENT MFG. CO.

ROCKFORD, ILLINOIS

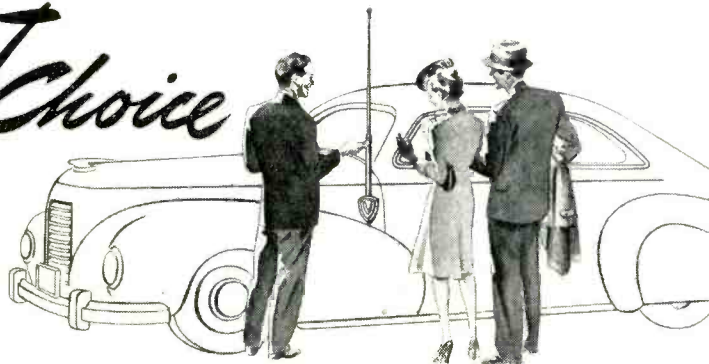
PRODUCERS of:

- Variable Resistors
- Selector Switches
- Ceramic Capacitors, Fixed and Variable
- Steatite Insulators
- Silver Mica Capacitors

Centralab

Division of GLOBE-UNION INC., Milwaukee

First Choice



OF AMERICA'S AUTO DEALERS

The same precision workmanship and the same fine quality mark Ward Antennas now as before the war. But now there are added reasons of new design and newly-engineered efficiency which will give Ward Antennas an even greater margin of preference with America's auto dealers. For extra profits that satisfied customers always bring, order Ward—world's finest antennas for car and home.

WARD Antennas



Buy Victory Bonds

THE WARD PRODUCTS CORPORATION • 1523 E. 45TH STREET, CLEVELAND 3

In Trade

[from page 73]

new display card is available for creating counter sales. Ne-O-Lite Mfg. Co., Rockford, Illinois.

Proctor Electric Moves

The Proctor Electric Company moves its sales offices from 480 Lexington Avenue to 220 East 42nd Street, New York 17. Oswald MacCarthy, eastern regional sales manager, D. W. Thompson, New York district manager, and Mrs. Mary R. Riedel, director of the Proctor Information Center will be located there. The Service Department will continue at the Grand Central Palace, 480 Lexington Avenue. It will be under the direction of Mrs. Laura Fleming, assisted by an increased staff to take care of parts and service on all Proctor products.

Universal Revises Territory

Universal Microphone Co., Inglewood, Cal., has revised its California sales territory and appointed Herbert Becker as northern California factory representative with headquarters in Burlingame. He will cover the area from Fresno north.

S. H. Cohn, Los Angeles, acting as California factory rep. of Universal over a long period of time, will now represent southern California, including Fresno and the area southward.

Voltage Gain Measurements

[from page 45]

first point of injection of this signal is at *F*, at which point the audio output of the signal generator is connected. The V.T.V.M. probe is connected to *G* and *F* in that order, and the gain of the 1st audio stage is the ratio of these two readings. For resistance coupled audio stages values of gain between 10 and 40 are generally obtained. Phase inverter gains vary between 5 and 20.

The ratio of the reading obtained between *points G* and *H* is the gain of the output stage.

To measure the step-down ratio of the output transformer, an audio signal is inserted at *point H*, and the voltages at this point and across the voice coil are measured with the V.T.V.M. Since this ratio may be rather high, the voltage across the voice coil may be too small to be measured. The signal may be then inserted at *points G* or *F* until a satisfactory reading is obtained. The ratio of the output transformer is equal to the



Be sure the capacitors you install are "going to stay put". And that's where AeroVox capacitors come in. They're fresh. The popularity of the AeroVox line means quick turnover of jobber stocks. You can be sure that AeroVox capacitors are of current production. That's especially important in electrolytics. And all you've got to do is look for the YELLOW label!

AEROVOX
Capacitors
INDIVIDUALLY TESTED

AEROVOX CORP., NEW BEDFORD, MASS., U. S. A.
In Canada: AEROVOX CANADA LTD., HAMILTON, ONT.
Export: 13 E. 40 St., NEW YORK 16, N. Y. - Cable: 'ARLAB'



ratio of the two voltages observed.

To obtain good results with the instruments just described, certain precautions must be observed, otherwise spurious readings due to stray pick-up will result in meaningless measurements. This pick-up is mostly the result of induced 60 cycle currents in unshielded leads. It is imperative, therefore, that all leads carrying signals to be measured should be effectively shielded.

On the other hand, shielded leads introduce capacities which might short-circuit these signals, especially at the higher frequencies. This effect, almost entirely, may be made negligible by using a shielded cable of large diameter and with a wide separation between the inner conductor and the outer shield. Coaxial cable fits these requirements excellently.

It has been the purpose of this article to outline the various steps in obtaining gain measurements in a radio receiver. The many difficult service problems that may be readily solved in taking these measurements have not been discussed because they are far too numerous to be included in its scope. However, it has been the author's experience that continued application of these techniques will make apparent invaluable short-cuts and solutions to service problems that, hitherto, have been difficult to solve.

Service Market In Industrial Electronics

[from page 43]

A term encountered in phototube terminology is "gas-rate", or "gas amplification". This is used to express the ratio between the photo current with the gas content and that for the same anode and cathode structure in vacuum. The values of this "gas rate" vary from 3 to 10 times for various tubes.

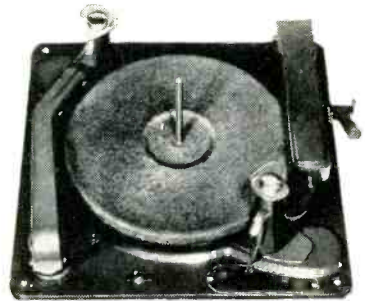
Applications

Before considering photo cells of the barrier type let us consider some applications and circuits for use of phototubes. Some of the industrial applications are: counting, smoke control, traffic control, burglar alarm, opening and closing doors, color control and illumination control, etc.

Fig. 5 illustrates a circuit utilizing a phototube and a 2051 type thyatron for energizing a relay by light increase. The relay may start a motor to open a garage door or turn off an illuminated sign, etc. Resistor R_3 is adjusted to prevent the thyatron from conducting up to some light intensity beyond which we wish the thyatron to fire. Fig. 9B of Part 2 of this series (*Radio*

UP FRONT...

Every Time



Combination record-changer recorder
Model GI-RC130

You'll like our postwar line of Smooth Power motors, recorders and combination record-changer recorders. They are right up in front with high-quality, velvety smooth operation, perfect fidelity in recording or reproduction.

They have the same fine design and built-in qualities that deliver complete satisfaction, as always. There is no skimping of details to give us fast production. You'll have a front seat in the postwar markets with General Industries phonograph mechanisms.

THE GENERAL INDUSTRIES CO.
Dept. M • Elyria, Ohio



BOOKS THAT TELL YOU HOW

3 new books that give you the basic knowledge for successful work in post-war radio.

PRINCIPLES OF RADIO FOR OPERATORS



I.
By Atherton. Clear instruction on the operating principles of all parts of radio, including antennas, with full details about equipment and procedures for construction and operation. Many visual aids to help the beginner. \$3.75.



INTRODUCTION TO ELECTRONICS

2.
By Hudson. A simply written but scientifically reliable explanation of the theory, construction, and uses of the various electron tubes and other electronic devices, showing their enormous potentialities for future developments. \$3.



INTRODUCTION TO PRACTICAL RADIO

3.
By Tucker. An outstandingly clear, thorough training in the basic principles of radio circuits and their components, with full explanations of the necessary mathematics at the points where it is used. \$3.

FREE EXAMINATION

By using the coupon below you can procure copies of these books to look over for 7 days without cost or obligation on your part. Send for your copies today.

Special note to Dealers

YOU CAN MAKE A DOUBLE PROFIT THROUGH HANDLING BOOKS

- Books bring you better buyers. They stimulate the interest and knowledge that makes steady customers. The more your customers learn about radio the more they will buy from you.
 - Books are a profitable stock item. Our trade discounts allow you a good profit on each sale. Our wide promotion insures their sale without effort on your part.
- Let these books be salesmen for you. Let them make you an easy profit. By returning the coupon below you can get copies for your book counter at the full dealer's discount. Cutis and copy for your catalog listings are also available. Write to our Technical Book Dept. for information.

The Macmillan Co., 60 5th Ave., New York 11

- Please fill my order for the books checked by number below, with the understanding that if I return them within 7 days my bill will be cancelled.
- Please fill my order, at dealer's discount, for _____ copies of the books checked.

SIGNED _____

ADDRESS _____

1. 2. 3.

Service Dealer, Nov. 1945) illustrates the basic circuit used for thyatron control. Such a circuit is altered to that of Fig. 5 in this article to accomplish the above. An increase in light falling on the phototube cathode causes in-

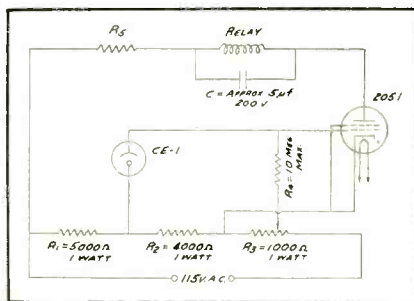


Fig. 5—A phototube relay circuit for energizing a relay by light increase.

creased phototube current. Under this condition with the thyatron plate positive the grid is negative. Increased phototube current causes a drop across R_4 thus decreasing the negative bias on the 2051. This tube then becomes conducting and the plate current pulses flowing through the relay coil will cause the relay to be activated. R_3 functions as a current limiting resistor to control the relay and thyatron current. The function of the capacitor across the relay was discussed in Part 2.

Fig. 6 shows how by a slight circuit alteration to Fig. 5 the thyatron grid voltage may be made more negative by a light increase thus preventing the thyatron from conducting. A decrease in light causes a decrease in negative bias and the thyatron conducts causing relay excitation.

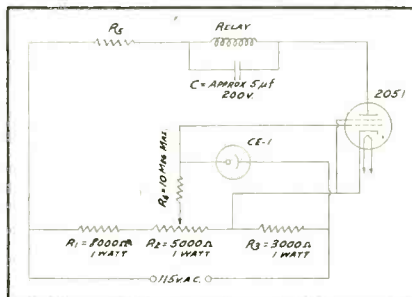
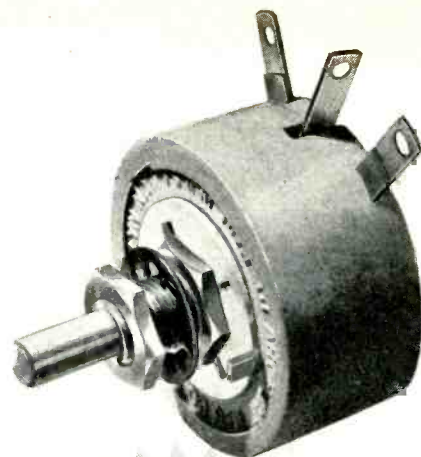


Fig. 6—A phototube relay circuit for energizing a relay by light decrease.

Fig. 7 illustrates a phototube and thyatron used in such a control circuit as described above. This unit, manufactured by General Electric, is shown as being representative of the type of equipment that is encountered in Industrial Servicing.

Further phototube material control circuits and data may be found in the



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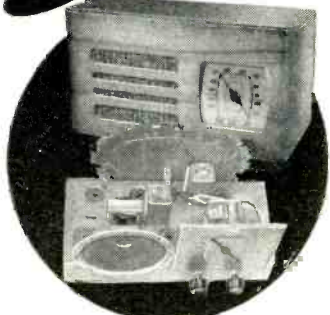
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Fig. 7—A G.E. photoelectric control general purpose relay using a phototube and thyatron. Note compactness of unit from the dimensions shown.

material of the appended bibliography.

Part four of this series will include information on the barrier type photocell and on timing circuits.

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Fundamentals of Industrial Electronics—G.E. Booklet GEA 4309

Choosing Test Equipment

[from page 41]

with a-m receiver work, which can be done simultaneously on the a-m service bench.

From this rather sketchy survey, it appears that an appreciable quantity of new test equipment will be required. Although not news to some, few of us have established a definite modernization program, and very few have a systematic arrangement for accumulating funds for that purpose.

If one is seriously in business, the sensible thing to do is to set up a depreciation and expansion reserve account. Make it a "Sacred Cow," fatten it, and respect it enough not to withdraw nor borrow from it for any other purpose, for herein lies a secret of financial success. This fund represents the profit set aside for the healthy expansion of a business when the time is ripe.

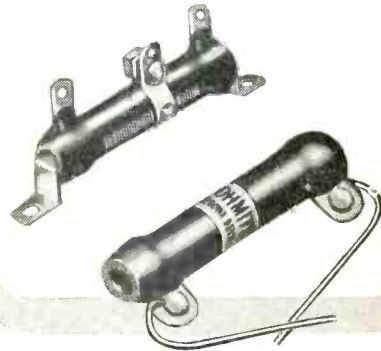
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Test Equipment

[from page 77]

better handling of their increasing business load.

Nevertheless, even though restrictions are removed, this buying should be done cautiously. Instruments are becoming available in increasing volume and choice, but it should be constantly borne in mind that a new era in servicing is just beginning, therefore consideration must be given to the question of buying for the future. One should ask himself, "Suppose I buy new a-m servicing equipment today. Will it be good five or ten years hence?" When there is television equipment to buy later, it may be rather disappointing if your a-m servicing equipment has to be replaced instead.

Of course, this does not mean that an active business should be deprived of a necessary tool until the test equipment manufacturer can deliver some of the recently announced post-war models: there always is the trade-in possibility if the game can be played to one's financial advantage.

In considering the purchase of a single unit of test equipment, one should judge the various makes available from a standpoint of (a) how well it will meet his own present and future requirements; (b) how many of its features are going to be truly advantageous from a standpoint of accuracy, safety, convenience, efficiency, and possibly appearance.

Such things as adequate range selection, durable test leads, substantial test lead connectors, safe high-voltage handling components, easily operated and properly functioning controls, permanent control designations, easily interpreted range selections, and little extra conveniences should guide one's judgment in an external examination when contemplating the purchase of a test instrument.

Common sense is a good yardstick where prices are concerned, for back of the pricing is the manufacturer's reputation, engineering knowledge, methods of construction, inspection and calibrating facilities, and in many cases replacement parts and technical service. It is not hard to realize that prices of instruments must be commensurate with the number of functions, as well as the quantity and quality of materials used in their construction.

If the price seems exceptionally low, one may rest assured that some corners have been cut at the expense of one or more factors that make a quality product. Perhaps a careful analysis of advertising claims used in describing

some test instruments will clarify the foregoing considerations.

As it is the customer who makes the final decision, it is up to him to choose between "bargains" and quality, and the choice will normally be influenced by the purchaser's financial status and the type of service which he desires to render. However, the choice of test equipment should be decided by one's present and expected business: the necessity for acquiring quality and durability at a fair price; and the assurance of complete facilities to handle customer requirements. These considerations are essential in planning the future of your radio service business.

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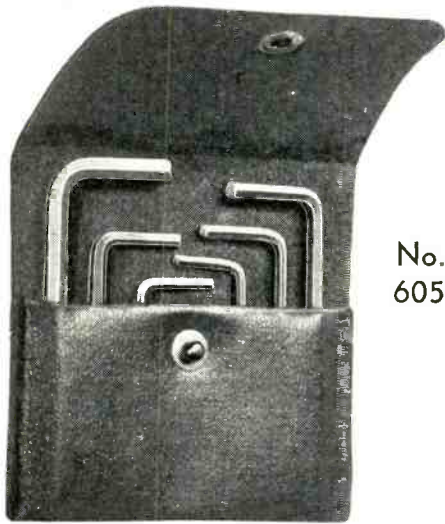
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Light Up — It Pays!

[from page 24]

and equipment, add something to atmosphere. But none of these, perhaps, is more important than lighting. Without tasteful, adequate lighting levels the full beauty and harmony of all other decorative elements may fall short of their goal.

For the modern radio showroom, fluorescent lamps are well adapted to creating the impression of effective and modern atmosphere. The general overall lighting system sets the tone and establishes the personality of the store. In the minds of the majority of people, fluorescent lighting is synonymous with modern lighting. This new lamp provides a quality of illumination more nearly approximating daylight than any previous light source. Behind valances and covers, in novel geometric patterns, in a wide variety of newly designed luminaires, fluorescent lighting brings new beauty and flexibility within easy reach of the radio service dealer.

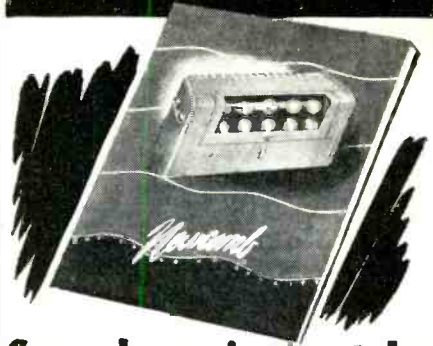
In addition booths, torchieres and portable lamps may provide the extra lighting intensities essential for effective display, while at the same time they add pleasing variety to overall salesroom atmosphere.

In radio stores in which it is not practical at first to relight with fluorescent, filament luminaires of modern design that provide indirect lighting reflected from light colored walls and ceilings are in line with current trends.

Much of the new radio, television and radio phonograph equipment will be housed in cabinets that are striking in design and alive with color. Even though value, performance and new features of construction will make a first bid for attention, it is safe to guess that appearance will be a deciding factor with many buyers. The full beauty of cabinet design and workmanship can only be effectively revealed under high levels of modern lighting. Auxiliary lighting units, so located as to make possible easy identification and quick appraisal, will enhance eye-appeal, reinforce every sales effort.

The radio dealer is standing on the threshold of a highly competitive merchandising era. Certainly he will not fail to provide his salesman with the same adequate lighting that his repair men have found necessary. Only with the best planned lighting that modern tools and techniques make possible can the radio dealer's sales force do the successful job that good lighting facilitates in the service department.

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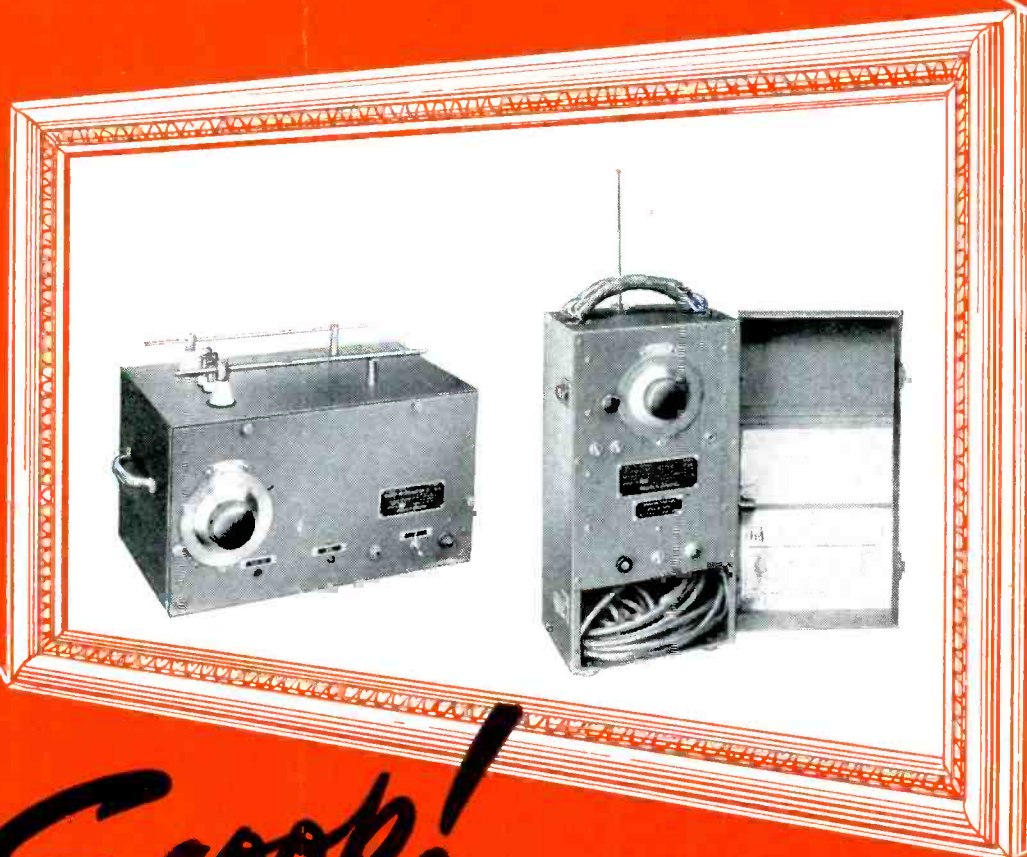
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