

radio dealer



In
This
Issue:

RADIO BUYING SURVEY
Sound System Applications

Here Comes Television
Test Equipment

April
1945
25c



ALL These Mallory Men Work For You



SALES and production executives . . . researchers . . . radio and electronic engineers . . . practical service men . . . wide-awake distributors . . . technical writers . . . advertising and promotion experts . . . all these, and many more, work for you in the Mallory organization.



Their first objective is to give you the *best* replacement parts that money can buy. But, equally important, it is to place them where you can get and use them promptly . . . to simplify your work in the matter of selection . . . to keep you abreast of technical changes . . . to help you answer difficult problems . . . to keep you "sold" with the radio public.



That's why Mallory, and *only* Mallory, is famous for things like these: A long and imposing list of engineering "firsts" . . . a standardization program covering the maximum number of applications with the minimum number of replacement items . . . a highly select and smooth-running distributor set-up . . . unsurpassed technical helps, like the famous M. Y. E. Technical Manual and the Mallory Radio Service Encyclopedia . . . institutional advertising unmatched by any other maker of radio parts.



All this adds up to something special and extra: the *difference* you feel in Mallory service . . . the confidence you rightly have in its products . . . the knowledge that, whatever repair work you are asked to do, the Mallory organization is all-out behind you—with everything possible to help you satisfy the customer.

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



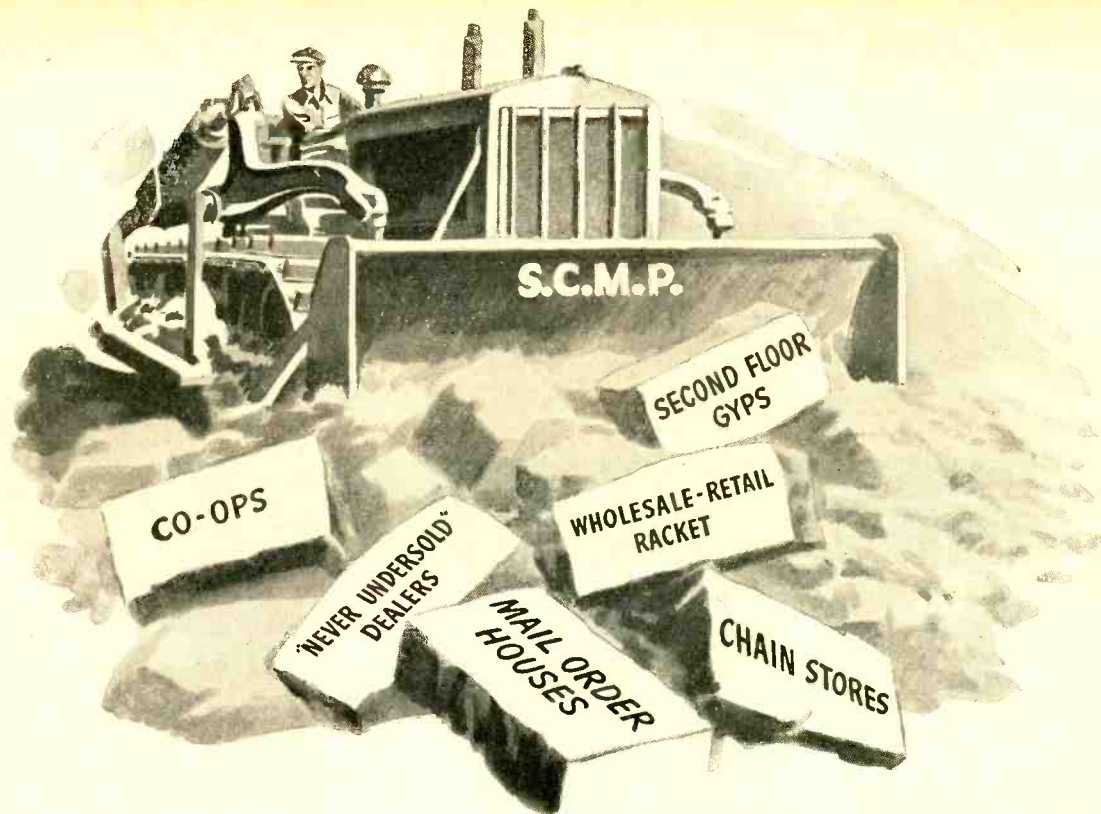
More than ever—
ALWAYS
INSIST ON

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.

*Trademarks



SPARTON'S EXCLUSIVE DEALERS

can meet any postwar competition
WITH THE S. C. M. P.*

REMEMBER the price cutting, dumping . . . the "wholesale-retail" racket?

Remember the long paper-profits that wound up as red ink?

Not pleasant to recall but perhaps it's a good thing to bring these things back to memory now . . .

With 125 manufacturers instead of 57 fighting for the market.

Good dealers will be offered the world with a fence around it.

But name one manufacturer other than Sparton who has a proved merchandising plan that protects the dealer.

After Victory is won, there will be new and finer Spartons—radios and combinations with FM, of unsurpassed performance. All in beautiful cabinets created by America's leading designers.

Name one other manufacturer who can give you high quality radio sets in volume at prices that will make you competitive with even the biggest Chains and Mail Order Houses.

Name one other who has adopted an exclusive dealer policy and stuck to it.

You can't.

Well, then, why not ask us if the Sparton franchise is still available in your community. It may be, although we are making dealer appointments very fast right now.

Radio and Appliance Division—Plant 5

THE SPARKS-WITHINGTON CO. • JACKSON, MICH.

***S.C.M.P.**

Sparton Co-operative Merchandising Plan. An exclusive method of profitably retailing radios and home appliances that has been and is being advertised regularly to consumers in leading magazines as the Sparton Way.

ONLY ONE DEALER IN EACH CITY AND TOWN

Check These Profit-Increasing Features

- One exclusive dealer in each area
- Direct factory-to-dealer shipment
- Landed dealer cost prices
- Low consumer prices
- National advertising
- Factory prepared and distributed promotion helps
- Seasonal promotions
- Uniform retail prices
- Products styled by outstanding designers

RCA Announces its New 195 VOLT OHMYST



4 IMPORTANT NEW FEATURES

- 1 Diode for a-c measurements. Flat 20 cycles to 100 kc.
- 2 Linear a-c scale for all ranges.
- 3 New plastic meter case with one-piece crystal-clear transparent front. No glass to break or loosen.
- 4 Shielded a-c cable and probe.

Send for Bulletin:

A special bulletin showing and fully describing this new improved version of the well-known VoltOhmyst is now being printed. Fill in and return the coupon for your copy.

TEST & MEASURING EQUIP., SECT. 126A
Radio Corporation of America
Camden, N. J.

Name _____

Street Address _____

City & State _____

BUY MORE



WAR BONDS

RADIO CORPORATION OF AMERICA

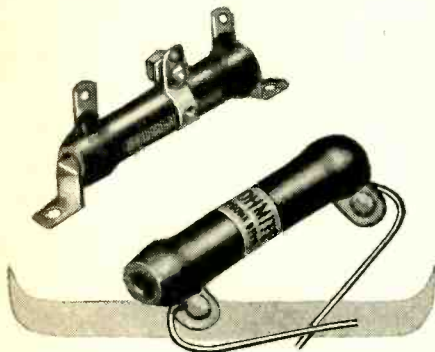
RCA VICTOR DIVISION • CAMDEN, N. J.

In Canada, RCA VICTOR COMPANY LIMITED, Montreal

OHMITE RESISTORS

*for accurate
trouble-free*

SERVICE



Time-proved, battle-proved, service-proved... Ohmite Brown Devils and Adjustable Divid-ohms are used today in critical war equipment. After Victory . . . these dependable units will again be the favorite of radio servicemen who want and use the best for resistor replacements.

For information about these and other Ohmite Resistors, write for Stock Unit Catalog 18.

SEND FOR HANDY OHM'S LAW CALCULATOR

Figures ohms, watts, volts, amperes—quickly, accurately. Solves any Ohm's Law problem with one setting of the slide. Send only 10c in coin for handling and mailing. (Also available in quantities.)



OHMITE MANUFACTURING CO.
4846 Flournoy Street • Chicago 44, U.S.A.

Be Right with **OHMITE**
RHEOSTATS • RESISTORS • TAP SWITCHES

radio service dealer

Covering all phases of radio, phonograph, sound and electrical appliance merchandising and servicing.

VOLUME 6, NUMBER 4

APRIL - 1945



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Post pages start the urge

TOMORROW'S
TELEVISION

THE SATURDAY EVENING POST



...that ends with buying action!



People purchase products
that are pictured in

THE SATURDAY EVENING
POST

SYLVANIA NEWS

RADIO SERVICE EDITION

APRIL Published by SYLVANIA ELECTRIC PRODUCTS INC., Emporium, Pa. 1945

**SYLVANIA
SERVICEMAN
SERVICE**

by
FRANK FAX

As another aid to servicemen, Sylvania offers its "Business Record for Income Tax Purposes" book—a simple, exact system of record keeping. (Many servicemen have been using this handy book for at least two years. Many probably wish they had.)

Two pages describe the best way to use your business record book.

Send for "Business Record for Income Tax Purposes" now—it can be started at once and will save time, expense and worry in the months to come. Your Sylvania distributor will be glad to show you a sample copy. Nominally priced at \$1.00, your copy can be had immediately.

Sylvania's Survey Report Shows Postwar Need for More Servicemen

Thousands More Repair Shops and Men Required for Big Job Ahead

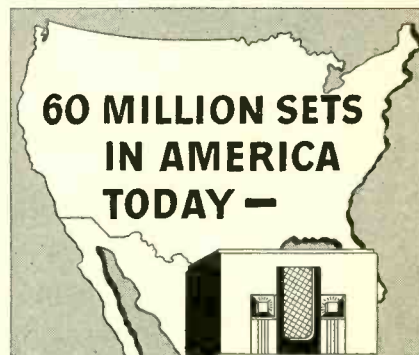
Once again Sylvania's nation-wide, independent radio survey—conducted by one of America's leading research organizations—reports facts and trends valuable to the radio serviceman. This is the second of a series of survey reports designed to aid servicemen in their present and postwar planning.

There are 60 million radio sets in use throughout America today. Sylvania's survey shows that as close as five to six years after the end of the war this number will increase to no fewer than 75 million home radio sets, plus a total of 25 million automobile radios. All of these millions of units are expected to be more complex in construction and will require more of the expert service radio repair men have been rendering.

Our survey reveals that present-day repair shops are well equipped, but

servicemen fully recognize the postwar need for more and better instruments—more and better training—essential to the big task of servicing millions of phono-console combinations, F. M., and television sets.

In keeping with this recognized need, Sylvania Electric has developed a whole kit of bulletins and technical literature to aid servicemen with their problems.



SYLVANIA ELECTRIC

MAKERS OF RADIO TUBES; CATHODE RAY TUBES; ELECTRONIC DEVICES; FLUORESCENT LAMPS, FIXTURES, ACCESSORIES; INCANDESCENT LAMPS

with the editor

Anniversary Greetings!

THIS ISSUE of "RADIO SERVICE DEALER" takes us past another milestone and into our 6th year. The 5 years past have been full of trials and tribulations for most of us. But, without doubt, the future looks brighter now than ever before. It's been a grand experience working with and for you this past half-decade. We

A Portentous Period

AS this editorial is written, Allied Forces are smashing all through the Reich. V-E Day seems imminent. Victory in the ETO may have been fait accompli before you read these words, and then again, it may be that resistance pockets may hold out for many months to come. But with a Victory in the European theater, much less than half of the total war will be won. The hardest job lies ahead.

Our military leaders have stressed that cessation of hostilities in Europe will merely permit a more concerted effort against the Japs. The need for *materiel* of war and all-out effort will become more acute and will not lessen much with Nazi defeat.

After V-E Day, Europe, a land that is destitute beyond comprehension, must be policed, fed and rehabilitated. American products will continue to flow across the Atlantic in increasing quantities. At the same time, the Western

One Meat Ball

MOST of us have heard that plaintive wail, "One Meatball" and have likened the theme to our own problem "One More Tube". Millions of America's radio sets are idle because they need "one more tube". Countless jobs lie

Terrific Pressure Is Ahead

OUR records show that over 120 different firms plan to market home radio sets Postwar. 44 others will make electronic industrial recorders and office dictating machines of the disc, wire and tape variety. 70 will make public equipment. For every manufacturer in any category Pre-Pearl Harbor there will be 50 to 70. Conditions in the retailing and servicing field are similar. Now there are only 14,000 radio-appliance retailing establishments soon there will be 80,000. Surveys show the public will consume about 3 to 4 times the pre-war volume of any given commodity. Note the discrepancy!

hope the years to come will find us all continuing to make steady progress.

Practically every advertiser who supported our initial venture, and a large number of our Charter Subscribers, are still "regulars". May it continue thus! We're not going to reminisce, for nothing is deader than yesterday's news. Our job, and yours, lies in the service we render in the future. Let's go!

Theater of Operations will require more and more *materiel* supplies will be accumulated and finally the Japs will bow to Right and Might. Then the Far East will come in for its share of policing and rehabilitation.

War Production Board has hinted that with V-E Day will come a resumed production of some civilian commodities, but don't be disappointed if radio's "green light" fails to show for a still indefinite period. Shelves are bare. Customers are richer and more desirous of buying than ever before. Radios and electrical appliances, rate highest in the "wanted" column, a fact recognized by WPB. Be patient. And while waiting we can be planning planning what lines we'll handle, how to organize and establish the several departments that go towards making up a radio-appliance service dealer establishment how to meet the greatly increased competition that's imminent . . . how to grow and prosper in the boom, but hectic, days that are just ahead.

undone on service-dealer's benches because of that missing "one more tube". Tubes are the radio industry's big bottleneck. WPB's first act, come V-E Day, should be to correct this mishandled, unwarranted condition. It can be done without impairing the war effort in the slightest. It should be done for the public.

A "dog-eat-dog" competitive situation unprecedented in American annals faces us. The situation is fraught with danger but cannot be avoided under our system of free enterprise. Rampant price-cutting and dumping, inevitable if the going gets tough, can demoralize the industry, afflicting the offenders and innocent alike. Dealers have consolation in knowing that advertised brands have ever been recognized as the safest ones to handle. Only the most reputable manufacturers are permitted to advertise in "RADIO SERVICE DEALER".

S. R. Lowan

In & Around the Trade

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



Vice-President Harry Truman addresses the St. Patrick's Day banquet of the Irish Fellowship Club in the Grand Ball Room of the Stevens Hotel, Chicago. Recording the speeches on the "Utalker", a wire recorder, are Burt Carter and Chick Brott (foreground), of the Utah Radio Products Company Chicago.

Hytron Name Change

At a recent meeting of the board of directors, the name of Hytron Corporation, Salem, Mass., was changed to Hytron Radio and Electronics Corporation. The following officers were elected: Bruce A. Coffin, president and general manager; Lloyd H. Coffin, treasurer and chairman of the board of directors; Edgar M. Batchelder, executive vice president; Charles F. Stromeyer, vice president and director of engineering.

Raytheon-Belmont Merger

Negotiations are under way to combine the forces of the Raytheon Manufacturing Co. and the Belmont Radio Corporation, as announced today by Lawrence Marshall, president of Raytheon, and Parnell Billings, president of Belmont. The two firms currently have total annual balance in excess of \$200,000,000.

Belmont, one of the country's largest producers of private brand radio receivers sold through mail order houses, chain stores and other retail outlets,

has its plant in Chicago. Raytheon, a leading manufacturer of electronic tubes, operates its plants in Newton, and Waltham, Mass.

The contemplated move to unite the firms would combine their large re-



At annual meeting of the company in Boston, Don C. Mitchell, vice-president in charge of sales, Sylvania Electric Products Inc., was elected to the Board of Trustees.

search departments for the development of both radios and tubes. In addition, it would add the Belmont sales organization to Raytheon's distribution facilities. At the present time both companies are engaged almost entirely in military production, much of which is under security restrictions. The combination would pave the way for postwar expansion of the joint production facilities in home radio receivers and in tubes, as well as in micro-wave communication, frequency modulation, industrial electronics and television.

Ohmite Endows Laboratory

Dr. Henry T. Heald, president of Illinois Institute of Technology, today announced an initial grant of \$15,000 from the Ohmite Manufacturing Company to be used for the establishment of a laboratory for the precision measurement of electrical and magnetic quantities.

The gift came through David T. Siegel, president of Ohmite Manufacturing Company and a trustee of Illinois Tech. It represents the initial contribution for equipping what will be known as the Ohmite Laboratory for Precision Measurements. It will be constantly expanded as new equipment becomes available. Mr. Siegel, in presenting the gift, stated the purpose of the laboratory as follows:

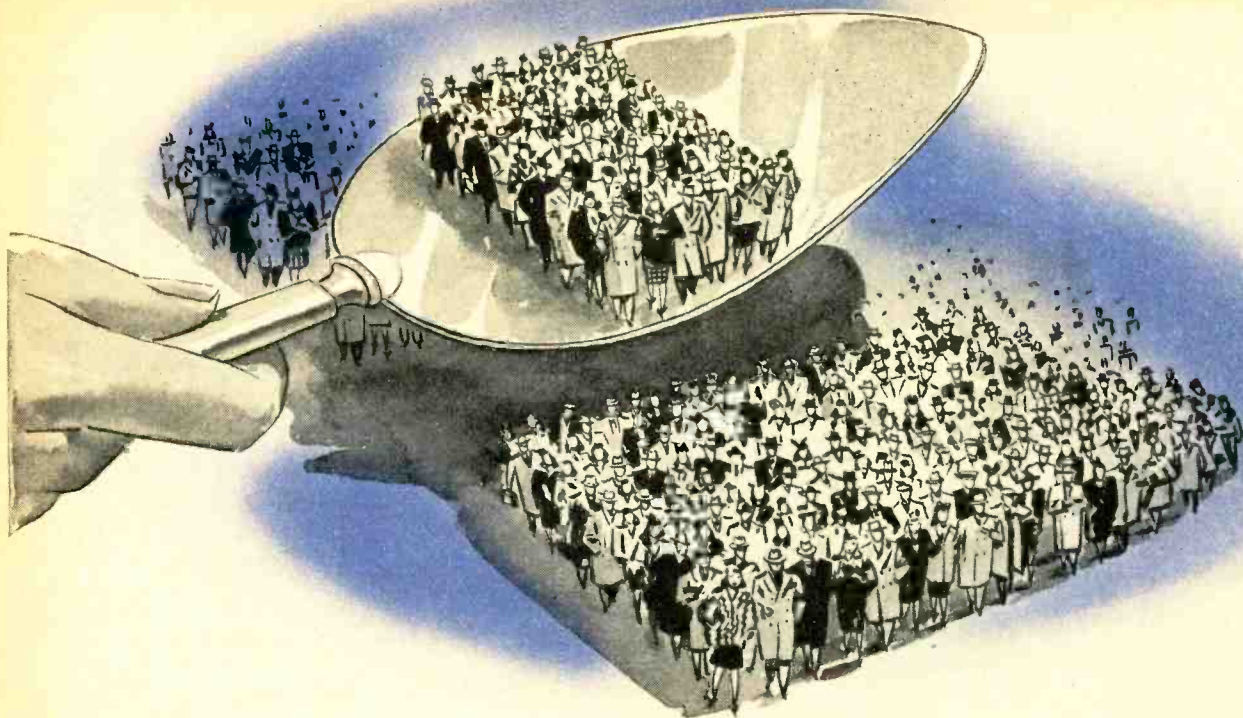
1. To provide facilities for studying the fundamental measurement of resistance, inductance, capacitance, current, voltage, power, power factor, permeability, etc.—basic quantities of electric and magnetic circuits and fields.
2. To provide calibration facilities for instruments and meters used in research and industry by affiliated organizations at Technology Center and by industries of the Chicago area.
3. To stimulate advanced training of the electrical engineering students at the Illinois Institute of Technology in the important field of precision measurements.

Manufacturers of various kinds of electrical equipment, power companies and colleges are among the organizations that will benefit from the project.

Wire Recorder by Utah

Giving a demonstration of the first of the company's post-war products at each of his many stops, Robert M. Karet, sales manager, wholesale and sound division, Utah Radio Products Corp., 820 N. Orleans St., Chicago, was the featured speaker at gatherings of the firm's jobbers held during March

[Continued on page 10]



Cut Yourself a Slice of Radio Market

-- be sure of guaranteed delivery
on your first radio requirements



"Buy your new radio from Your Radio Dealer"—that is the theme of MECK advertising to your customers—appearing in Liberty Magazine.

Your biggest postwar problem is—deliveries. Here is a sales plan that answers that problem by guaranteeing deliveries.

An organized sales and distribution plan makes it possible for you to depend on *your share* of the finest radios available immediately after civilian set production starts.

Meck Radios will be sales leaders, year in and year out—from the start. You can now reserve a section of my production line, get your share of the big radio market, and stop worrying.

Ask your Parts Jobber today or write

JOHN MECK INDUSTRIES, Inc., PLYMOUTH, INDIANA

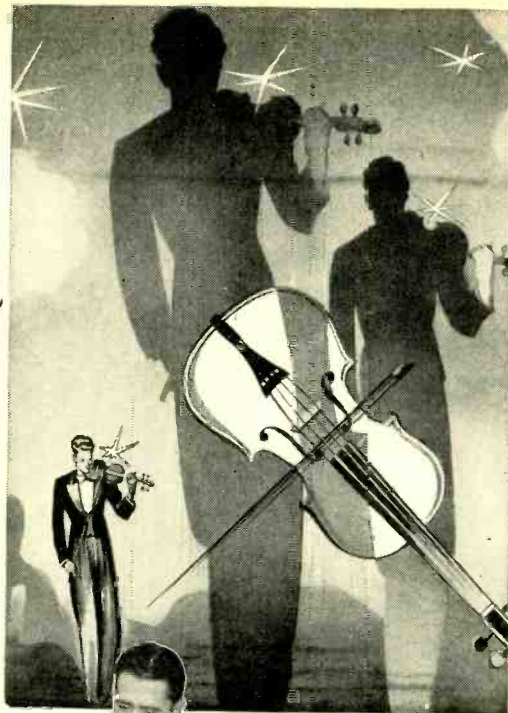
John Meck



MECK RADIOS

TABLE MODELS • PORTABLES • CONSOLE COMBINATIONS • PHONOGRAPHS

The Wonder of it All



NEVER has man's mind been so taxed as it is today ... and never have his accomplishments been greater. In supplying the demands created by a world at war, products that were scarcely even dreamed of a few years ago are today realities ... and it all happens so smoothly, so precisely, so naturally, that we scarcely realize the wonder of it all. Research in every field of endeavor has moved us ahead fully half a century in time. So it is with The Astatic Corporation. While producing important essentials for wartime use, Astatic engineers have also planned for the postwar period. Among Astatic's many new and improved products for the detection, recording and pickup of sound will be a zephyr-light pickup for phonograph and radio phonograph sets as important to improved phonograph performance as FM will be to radio. Now, as never before, the human voice and instrumental artistry of the entertainment world will be reproduced from modern recordings with tone fidelity and true-to-life realism to bring a great, new listening audience "closer to the stars."

"You'll HEAR MORE from Astatic"



THE **Astatic** CORPORATION
 CONNEAUT, OHIO

IN CANADA: CANADIAN ASTATIC LTD., TORONTO, ONTARIO

ASTATIC Crystal Products manufactured under Brush Development Co. patents.

In Trade

[from page 8]

in various centers from Spokane, Wash., to St. Louis, Mo.

The initial post-war unit to be released by Utah is the wire recorder. Besides showing the new product, Mr. Karet spoke on the methods radio service dealers should use to combine tested business ideas with their servicing to improve the running of their service shops in the coming post-war era.

"The post-war situation seems very rosy," said Mr. Karet, "if service dealers will comprehend that the market has become almost wholly technical and is no longer a screw-driver mechanic's paradise. Combining sales and business methods with technical training, then operating along strictly business lines, will result in greater income in the period ahead.

"People have become conscious of the word 'electronics' and they will hardly countenance the type of work or firm which gives them the impression that it is a fly-by-night. Substantial and well-founded business houses will be in demand for servicing and electronic work and sales."

Continue Tube Supply

General Electric will continue to supply Ken-Rad tubes to Ken-Rad customers and will not disrupt established distribution, it has been emphasized by G.E. officials.

Purchase of Ken-Rad tube interests by G.E. will result in a gradual expansion and improvement of tube facilities which will reflect in better service to Ken-Rad customers, officials explain. However, because of war demands this will not mean more tubes for customers until military requirements are relaxed, they point out.

It also is being explained to customers that Ken-Rad now will have the benefit of General Electric's engineering and research facilities. The Ken-Rad group is now officially known as the Ken-Rad Division of the General Electric Company's Electronics Department.

Television for V-E Day

Ralph B. Austrian, executive vice-president of RKO Television Corporation, announces that his company has been selected by the Blue Network of the American Broadcasting Company to cover its V-E Day news room activities.

Austrian states, "A crew of camera

[Continued on page 12]

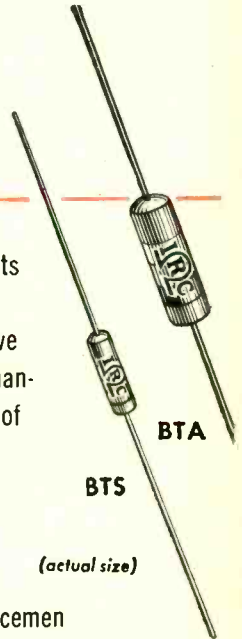
RADIO SERVICE DEALER

"Big Three" news about BT resistors

1

NEW MIDGET TYPES

To meet the growing demand for smaller, space-conserving components, IRC presents two new insulated METALLIZED resistors . . . Type BTS, ½ watt and Type BTA, 1 watt. Thoroughly dependable and engineered to embody the high-quality standards that have made BT's "preferred for performance", these tiny units can be counted on to do a man-size job. Like other BT's they operate at lower temperature than ordinary resistors of comparative size.



(actual size)

2

NEW LOW PRICES

New methods and new techniques in the stocking and packaging of resistors for Servicemen make possible the introduction of new lower prices on IRC Type BT and BW resistors. This means that you can now buy premium quality resistors at prices comparable to non-branded or "unknowns". For example, here are a few of the typical reductions based on list prices: BTS now 13c (BT-½ was 17c), BTA now 17c (BT-1 was 20c), BT-2 now 25c (was 30c), BW-½ now 15c (was 17c), BW-1 now 17c (was 20c), BW-2 now 25c (was 30c). Under IRC's new price set-up you can operate even more profitably than before.

3

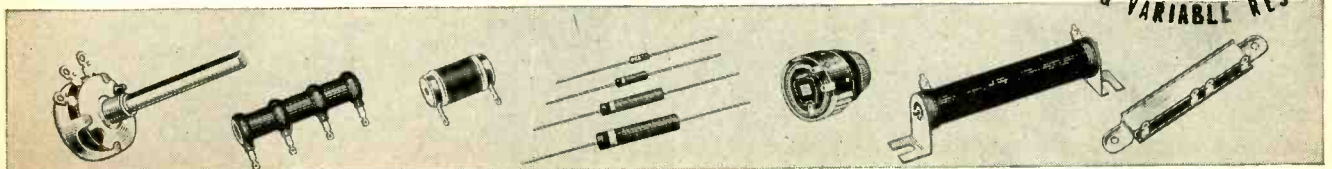
RMA PREFERRED RANGES

IRC's standardization on RMA Ranges in both BT's and BW's as stock values for Servicemen, enables you to replace the same values you take out when making resistor repairs. Long used by set manufacturers, and now adopted by the Army-Navy in Specification JAN-R-11, the RMA Preferred Number System is a mathematical sequence of ranges which gives complete coverage with the least number of values. RMA Ranges listed for ±10% tolerance resistors are carefully spaced so that preceding or following values are never more than 20% apart, thus assuring complete coverage of every value with regularly stocked BT's and BW's.

INTERNATIONAL RESISTANCE CO.

DEPT. 22-D • 401 N. BROAD ST. • PHILADELPHIA 8, PA.

IRC makes more types of resistance units, in more shapes, for more applications than any other manufacturer in the world.



Convenient Pocket-Size

for

CONTINUITY TESTING



WESTON MODEL 689 OHMMETER

Pocket-size but with typical WESTON dependability and ruggedness, Model 689 Ohmmeters are unequalled for checking circuits by resistance and continuity method. Available in two types . . . type 1E with double range of 0-5,000 ohms and 0-50,000 ohms, and type 1F with double range of 0-10 and 0-1000 ohms . . . ideal for motor maintenance. Entirely self-contained. Order through your local Weston representative, or direct from . . . Weston Electrical Instrument Corporation, 689 Frelinghuysen Ave., Newark 5, N. J.

WESTON *Instruments*

In Trade

{from page 10}

men will be on call so that the minute the news breaks, they will set up their equipment regardless of the hour, in the Blue's news room and will film interesting scenes transpiring in this major network's news room when one of the world's most important news events breaks. All plans have been worked out to process this film in record time at RKO Television's local laboratory. It will then be rushed by relays of special messengers to DuMont's WABD station, where it will take to the air having right of way over all and any other programs which might be on.

"This is the first time that television has set itself up to give 'priority service' to news events. The coordinator of the undertaking is Paul Mowrey, television director of the Blue Network. RKO Television Corporation's entire personnel has been alerted until further notice."



Ward R. Schafer

Schafer Vice President

R. W. Trumbull, president, announces election of Ward R. Schafer vice-president, Edison General Electric (Hotpoint) Appliance company, in charge of sales.

Mr. Schafer has been with Hotpoint since 1923 when he joined the company as an engineer in the commercial cooking division. Later he served as manager of product service, and was manager of the company's range division when war production interrupted production in 1941. During 1942 he gained a leave of absence from the company to superintend the construction of a 26 million dollar butadiene plant in Texas. He returned to the company as manager of the western sales region in 1943, later being placed in charge of all Hotpoint sales.

[Continued on page 39]

SERVICE TO SERVICEMEN... THAT'S STANCOR'S RECORD

Standardize
ON

STANCOR

Call your nearest Stancor Jobber...
or write us for his address

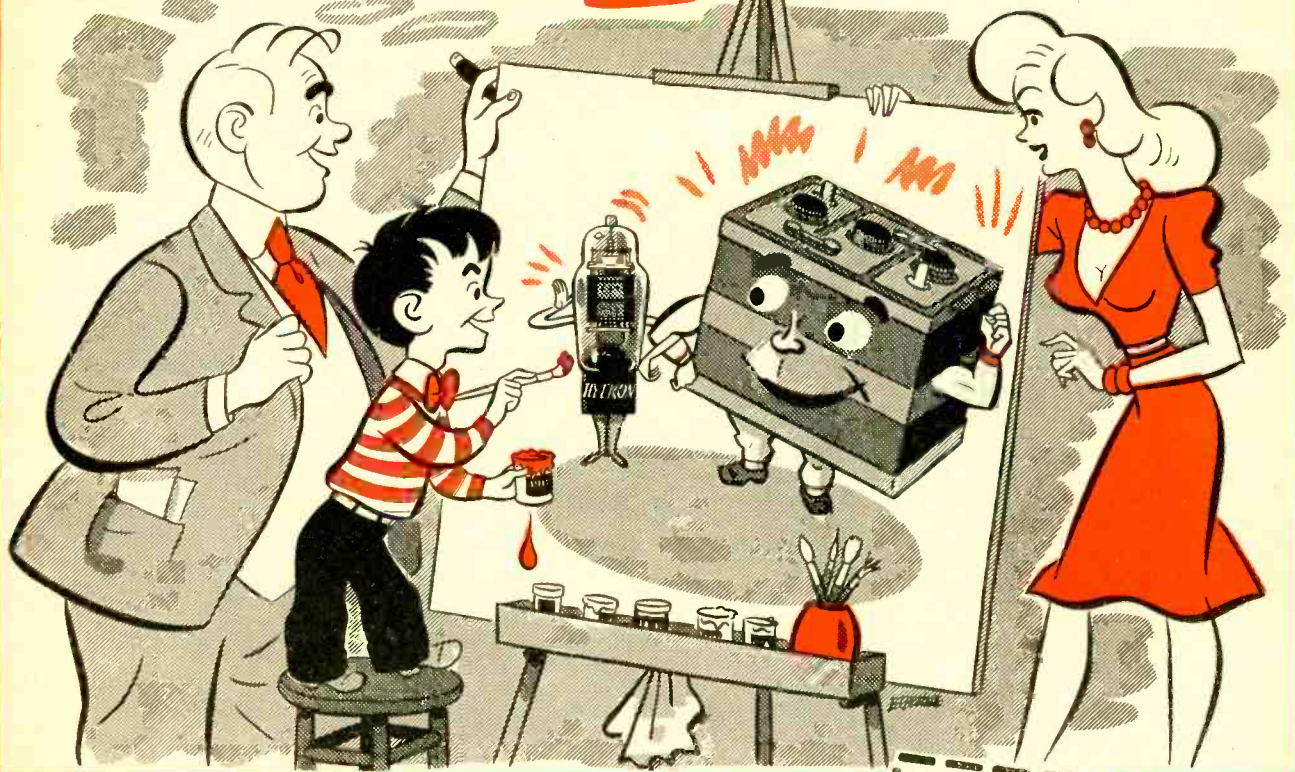
Transformers

STANDARD TRANSFORMER
150C N. HALSTED STREET • CHICAGO



CORPORATION

Again it's HYTRON-Easy on the Battery!



In mobile operation, the battery is the kingpin. Two-way police radio takes it out of the battery twenty-four hours a day. Conservation of battery power during stand-by periods is mandatory.

Instant-heating Hytron tubes with thoriated tungsten filaments came to the rescue of police radio. Only when on duty, does police radio equipment draw power when Hytron tubes are used. Filament and plate power go on together.

And that's not all. The Hytron HY31Z, HY65, HY69, HY1231Z, and HY1269 are rugged. HY65 performance in two-way motorcycle police radio has proved this. Including 12-volt filament tubes for marine applications, Hytron's instant-heating line is versatile. Concentration is on the R. F. beam tetrode — work horse of transmitting tubes — but also included is the HY31Z twin triode for Class B. One type can power a whole transmitter — R. F. and A. F. — thus simplifying the spares problem (e.g., Kaar Engineering transmitters built around the HY69).

Wartime uses are bringing additions to the Hytron instant-heating line. Watch for future announcements.

HYTRON HYLIGHTS



HY69
HY1269



HY65



HY31Z
HY1231Z

HY65 Instant-heating r.f. beam tetrode; 6 v. fil.; 15 w. plate dis.; 450 v. plate; 75 ma. plate.

HY31Z and HY1231Z Instant-heating r.f. twin triodes; 6 or 12 v. fil.; 30 w. plate dis. (2 sections); 500 v. plate, 150 ma. plate (2 sections).

HY69 and HY1269 Instant-heating r.f. beam tetrodes; 6 or 12 v. fil.; 30 w. plate dis.; 600 v. plate; 100 ma. plate.

All these tubes may be used as modulators, oscillators, amplifiers, or frequency multipliers.

**FORMERLY
HYTRON
CORPORATION**



OLDEST EXCLUSIVE MANUFACTURER OF RADIO RECEIVING TUBES

HYTRON

RADIO AND ELECTRONICS CORP.

MAIN OFFICE: SALEM, MASSACHUSETTS
PLANTS: SALEM, NEWBURYPORT, BEVERLY & LAWRENCE

RADIO service DEALER

SURVEY

MORE LETTERS FROM READERS give views on the questions:

- 1. Shall Radio Servicemen and Technicians be required to undergo examinations as to their technical ability?**
- 2. Shall Radio Servicemen and Technicians be licensed or not?**

LEAVES IT TO FCC

I have read the opinions of both sides of the question, "Shall servicemen be licensed?". The opposition's main point is that in licensing, graft by municipal and state politicians is invited. I think that this bone of contention can be removed by placing the whole thing under the Federal Communications Commission. I doubt if anyone will question their impartiality. After all, isn't the receiver just as much a part of communication as the transmitter? I think the proper thing to do is just lay the problem in the FCC's lap. They will work it out.

The same fellows that yell graft in radio licensing have so far failed to support their claims by pointing to graft in the licensing of civil engineers, doctors, lawyers and others. Some of these writers are sincere undoubtedly, others will move heaven and earth to prevent licensing for they know they are through when it begins.

I believe the situation has come to the point where it is no longer just a concern of the service industry, but has become something bordering on a national emergency. Why don't we clean house before we get it cleaned for us? It would look much better.

Remember the article in Reader's Digest about the radio servicemen and the various diagnose? I won't quote it for I am sure everybody in radio has had it thrown in his teeth. It won't take more than one more such article to get the public inclined to settle the licensing problem, taking it out of our hands.

I believe the house cleaning should come through efforts of RSA. They can make recommendations to the FCC and work up an impartial program. This way the house cleaning comes from within and the figurative "board of health" won't have to take action.

Finally, I believe there should be no charge for the license. Remove "E Pluribus Unum" as far from the picture as it has been in licensing commercial radio operators. Then, who can scream, "Graft!"

In the end radio servicemen of America can occupy the same relative position in the radio picture in its dealings with the FCC that the American Radio Relay league enjoys in representing the Amateur operator. And through organization, the position of ARRL is one to envy. For it certainly takes some weight to "hold the lines" in the radio spectrum assigned to the Amateurs, against the infiltrating commercials. Yet every time more space is assigned, have you noted that

SERVICE REGISTRATION

Legislation to require the registering of radio service men is increasing. RMA has been informed that a bill has been introduced in the Oregon Legislature to require the licensing of radio repairmen. A bill previously had been introduced in the California Legislature along the same line (RMA bulletin Jan. 31).

We would like to publish in full all of the many letters received from subscribers all over the country in response to our editorials on the subject. But space permits bringing portions of only a few examples which indicate a wide variety of viewpoints, and reveal again the will to eradicate many abuses in the field of radio servicing.

Numerous questionnaire returns are received daily. The returns will be tabulated and analyzed and the results published in one or more issues of RADIO service DEALER. Watch for future announcements.

the Amateurs get their full share, while holding their gains?

You may use all or any part of above, or quote same. I add this because for some reason (from the ballot's wording) the voter is expected to be timid.

C. L. Culley, La.

ELIMINATE RADIO BUTCHERS

There are many lines of work that have protection from "piddlers", quacks, and plain crooks. The radio service industry is desperately in need of similiar protection.

The writer, like a lot of technicians, had to learn competent radio servicing the "hard way" in the days when things were really tough. We're possibly a little short on a lot of theory, but just turn us loose at the bench!

We are getting increasing numbers of sets each week which have been butchered by a graduate of those government-sponsored radio training courses, or by GI's who have had theoretical radio instruction and some of the advanced maintenance and repair training.

In our opinion not one out of a thousand of these persons should be allowed to touch a civilian radio, much less attempt repairing it. They can do more irreparable damage in five minutes than you would imagine possible.

If these parties must attempt radio repair for the general public they should be required to pass an exhaustive practical bench examination before a board of practising, legitimate service technicians. Then if they pass that test, they should be required to prove that they have a very substantial test equipment set-up, all necessary manuals, plenty of necessary tools and a very definite place of busi-

[Continued on page 16]



UNIVERSAL'S NEW D-20 MICROPHONE

The stage was set for something new and here it is. Universal's new D-20 Microphone . . . soon on your radio parts jobbers' shelves to fill your essential requirements . . . uses Universal's "Dynoid" construction . . . A dynamic microphone of conventional characteristics built to fill the utility requirements of war time plus advance styling of the many modern things to come. Orders placed now with your Radio Parts Jobbers will assure early delivery when priority regulations are relaxed.

Write for Bulletin 1458 covering this new microphone.

◀ **FREE** — *History of Communications Picture Portfolio. Contains over a dozen 11" x 14" pictures suitable for office, den or hobby room. Write factory for your Portfolio today.*

UNIVERSAL MICROPHONE COMPANY
INGLEWOOD, CALIFORNIA



SURVEY

[from page 14]

ness—not work from an attic or basement, or some back alley.

R. E. (Bob) McKerral, Colorado.

PROPOSES A "CZAR"

Since your magazine is the "house organ" for radio service dealers, I think you should begin in the near future to lay a foundation for the coming radio service organization of our country. Certainly we all realize

now, what a blow we received by not having an organization of strength during the war.

Must we continue to compete with the ones who see an opportunity to pick up a few dollars "fixing" radios until they can adjust themselves to more favorable opportunities after the war? As it is now one has to have only a screwdriver and a pair of pliers, stick up a shingle and there you have a "qualified serviceman". The wholesaler will sell him parts and the public give him a try.

One of our big difficulties will be to get men with leadership capable of

leading us over. Technicians are not usually the best leaders, therefore we will have to do like the baseball leagues—hire a Czar.

I do not want any one to think I am hedging on the men who will return from the Armed Forces. If they are qualified to do our jobs better, let's salute them. But let us get rid of those birds that our ruining our business.

B. S. Waite, Ill.

DISCOUNTS WAR TRAINING

The "old hands" in radio can stop their worrying about the radio technicians in the armed forces, as they will not be able to offer any post-war competition. Their training will be utterly useless in business on civilian equipment. I have been in their schools and have seen their best students cope with civilian radio sets. It was awful!

W. E. Skelton Sr. RT 2/c

WILL CREATE "UNDERGROUND"

The licensing of radio men is only going to drive the poor mechanic underground, but it isn't going to kill him off. He will still repair radio sets for his "friends and relatives". To my mind all this license and examination business is just the old "central station" idea coming to the front once again. Many small service shops will go overboard for the idea and wake up to find they have frozen themselves outside the "charmed circle".

Jobbers and distributors are going to find that they are losing millions of dollars per year while the retail, over-the-counter store is going to find sales volume growing by leaps and bounds. The embryo (underground) servicemen will buy over the counter where it doesn't leave any trail for tax purposes. So the tax department will lose because there is no record of any work done. Men repairing the sets of a few hundred "relatives" per year just don't keep books . . .

J. F. Martin, New York

URGES CO-OPERATIVES

Licensing service-dealers looks to me like a lot of propaganda for the status quo. Licensing will prevent the incompetent from obtaining a license, but will not prevent anyone from buying merchandise and replacement parts and competing with the licensed service-dealer. There are too many big mail-order houses which cannot be controlled by licensing. There is also the problem of industrial discounts, where a purchasing agent for a firm can buy almost anything at a discount

[Continued on page 15]



"They figure those Simpson Testers are really worth waiting for" . . .

This much does make sense. While you're waiting for your postwar servicing instruments you might just as well be waiting for the best. And it makes sense, too, to expect the best from Simpson. Since the beginning of radio Ray Simpson has been studying *your* needs, *your* problems—setting the pace in the field with new ideas, new refinements. With such a background you can rely on Simpson Instruments and testing equipment to offer you more accuracy, more stamina, more value for every dollar you spend.

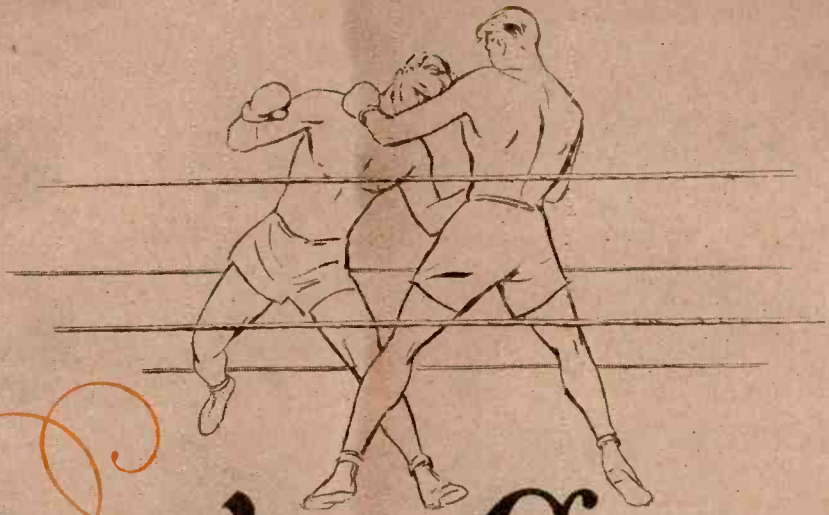
SIMPSON ELECTRIC CO., 5208-18 W. Kinzie St., Chicago 44, Illinois

MODEL 260 HIGH SENSITIVITY TESTER

Ranges to 5000 Volts, both AC and DC, at 20,000 ohms per volt DC and 1000 ohms per volt AC. Current readings from 1 microampere to 500 milliamperes. Resistance reading from 1/2 ohm to 10 megohms. Five decibel ranges. —12 to +52.



Simpson
INSTRUMENTS THAT STAY ACCURATE



Quality Counts

IN 1892, James J. Corbett beat John L. Sullivan to win the heavyweight championship of the world. Corbett, who was considered a novice in the ring, weighed only 186 pounds to Sullivan's 220, and yet he knocked out Sullivan in the 21st round. Corbett had that touch of quality—of extra quality—that expressed itself in victory. For superior performance in any product—just as with Victory in the prize-ring—*Quality Counts!*

For years, the antennas manufactured by THE WARD PRODUCTS CORPORATION have been known as quality products, the workmanship of craftsmen using modern equipment under ideal conditions. Constant adherence to the principles of quality coupled with manufacturing experience has made WARD the leader in the production of sectional and one-piece antennas. . . . For quality antennas for all applications, look to WARE.



WARD Antennas



BUY WAR BONDS

THE WARD PRODUCTS CORPORATION
1523 East 45th Street
Cleveland 3, Ohio

SURVEY

[from page 16]

and pass on that privilege to many employees in lieu of a raise.

What are the other trades doing? Let's take the grocery trade. The average dealer sometime ago was crowded by the chain store system. Many a grocery store went out of business and, for a time in some parts of our country, it appeared that the individual dealer was passé. But today he is stronger than ever. His problem now appears somewhat like

the problem that be ~~service~~ dealer—lack of strength, lack of a voice of authority. The grocery dealer has found strength and authority in a co-operative association.

The association grocery dealer demands the respect of the manufacturer because his association buys in huge quantities and enables both to work together in profitable merchandising. It enables the grocer to police his own organization. It enables him to reject any prospective member for dealing in products which do not meet the standards of the association. It allows him to share cooperative profits, and

it gives the dealer control of his immediate neighborhood—a franchise that is really a franchise.

There is a big future for service-dealers. The public has the money, the manufacturers will supply the products, the service-dealers is entitled to larger portion of the business. This can only be secured—and made secure—by uniting into a bonafide co-operative association.

L. J. Draus, Pa.

EXPERIENCE SHOULD RATE

I do not believe in examinations, as there are a good many servicemen who could not pass. I think the men who have been radio service dealers for some years should be licensed without examination . . .

Delmar, Cal.

What type of microphone is best suited for a particular application?

How can I convert the level of a microphone rated on the basis of milliwatts per bar to a level of volts per bar?

What new types of special purpose microphones have been developed for voice and sound transmission?

These and many other answers may be found in the NEW and COMPLETE *Electro-Voice* CATALOG

More than an exposition of microphone types, the new Electro-Voice Catalog provides a source of valuable information which should be at the fingertips of every sound man. It contains a simplified Reference Level Conversion Chart which marks the first attempt in the history of the industry to standardize microphone ratings. Several pages are devoted to showing basic operating principles of microphones . . . offering a guide to the proper selection of types for specific applications. And, of course, every microphone in the Electro-Voice line is completely described, from applications to specifications.

Reserve your copy of the new
Electro-Voice Catalog. Write today.

BUY AND
HOLD
MORE
WAR
BONDS

Electro-Voice MICROPHONES

ELECTRO-VOICE CORPORATION • 1239 SOUTH BEND AVENUE • SOUTH BEND 24, INDIANA
Export Division: 17 East 40th Street, New York 18, N. Y., U. S. A. Cables: A-108



THE CUSTOMER — RIGHT AND WRONG

After three years of wartime servicing, without help, little things that we have put up with without complaining, now take on a different aspect. For instance, that individual, John Q. Public, the one we wooed and lost so many times in the past. Now we can truthfully describe him as the chiseling sonuva . . . he really is:

Who wouldn't think of taking his ten dollar watch to anyone but a jeweler, but who will take his \$100. radio to the high school kid in the next block whose only claim to knowledge is that he built his own Xtal set.

Who will pay a barkeeper \$50 for an evening's entertainment and a dollar's worth of whiskey, but who hollers like h——at paying a radiotrician \$5 for three months' enjoyment of thousand dollar programs . . .

Who will take his business elsewhere because the garage mechanic adjusted the driver's seat an inch too far back, but who will let the house guest fiddle with the i-f adjustments just because he was a radioman on a plane . . .

Who will take off, and lose, all of the tube shields on his radio set, but wouldn't think of doing the same to the hood of his car . . .

And lastly (for the time being), who will promiscuously interchange tubes in his radio set but, never since he started wearing them, has he ever appeared in public with a left shoe on any but his foot . . .

J. (Radio Doctor) Mayr,



39 MILES OF RCA TUBE ADVERTISING IN 1944 ALONE!

A Policy that Means More Business for You

TAKE every ad about RCA tubes that reached industry, the trade, and the public during 1944.

The total area of all those ads would be equal to a billboard, 20 feet high, running for 39 miles! Talk about advertising wallop! There's a program designed to do a real job...to set your stage for postwar profits.

Eight and a half million ads...each a powerful message to tube customers. Over four million square feet of *selling*, building your future RCA sales. And the "billboard" is still growing, mile after mile.

No wonder it will be easier for you to sell RCA tubes. No wonder it will be more profitable.

**THE FOUNTAINHEAD OF MODERN TUBE
DEVELOPMENT IS RCA**

For with RCA's manufacturing skill and merchandising support behind you, you can't miss. You *know* your customers will want RCA. Sure, the RCA "billboard" is big...your postwar profits on RCA tubes will be big, too!

Listen to "THE
MUSIC AMERICA
LOVES BEST,"
Sundays,
4:30 P. M., EWT,
NBC Network



62-6636-91

RADIO CORPORATION OF AMERICA

RCA VICTOR DIVISION • CAMDEN, N. J.

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

Announcing



**12 VIBRATORS MEET 90% OF YOUR REPLACEMENT NEEDS
65 VIBRATORS REPLACE 101 DIFFERENT TYPES**

HERE'S real help in your service problems—a new Mallory program of vibrator standardization that cuts red tape... eliminates confusion in selecting the proper replacement... reduces the number of vibrator types from 101 to 65... yet provides you with the *right* vibrator for practically *every* application! And here's something better: *fully 90% of your replacement needs can be met by 12 standard Mallory vibrators!* What a time-saving, money-saving convenience that is! It means, among other things, that every service engineer can carry a complete stock in his own shop.

It obviously helps in speeding up service.

Yes, vibrator problems are now enormously simplified. **AND** nothing has been changed in vibrator quality! When you buy a Mallory replacement vibrator you still get a product backed by 14 years of "know-how"... made of carefully-selected materials... manufactured by precision methods... rigidly inspected every step of the way.

Standardize on Mallory vibrators. Ask for your copy of the new Mallory Vibrator Standardization Folder, write 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.

*Trademarks

ALL repair shops engaged in maintenance and repair work are subject to a number of War Production Board Regulations, made necessary by the need for controlling materials so that the Armed Forces may be properly supplied.

The information contained in this guide to WPB orders and regulations was up to date as of March 23, 1945, but it must be remembered that as the demands of war and the supplies of materials and products change, WPB is forced to keep in step by changing its regulations accordingly. Therefore, it is well to keep abreast of changes. Many of them may be of considerable benefit to the repair man. If you are in doubt as to the location of a WPB district office at which you can obtain assistance, ask your Chamber of Commerce or write to the War Production Board, Washington 25, D. C., for the location.

The following material is divided into sections covering controlled materials, motors, refrigeration and air-conditioning, solder, radio repair parts, repair parts and materials in general, tools and special equipment and a list of definitions.

Radio Repair Parts

"MR" radio tubes, which are usually the only kind available for civilian repair and replacement purposes, are at present on a voluntary allocation basis, from manufacturers to wholesalers to dealers or repair shops, and preference ratings on orders for the domestic market are not necessary under WPB Order L-265, which governs the distribution of radio tubes and repair parts. Radio repair shops should become particularly familiar with this order because of the certifications it requires them to use when ordering tubes and parts, and the restrictions it puts on their use. The rating assigned by CMP-9A may not be used for certain radio repair parts which are listed in the order.

Refrigeration and Air Conditioning

Special circumstances under which commercial refrigeration and air conditioning service shops may use AA-1, AA-2, or AA-5 ratings to purchase items that need and permit a rating, are explained in Order P-126. Additional rules as to the types of repairs which may be made are stated in Order L-38. Note that List B of Priorities Regulation 3 restricts deliveries of this equipment except when made in accordance with L-38. With respect to repair materials for do-

WPB Service Guide

For maintenance and repair men in the electrical appliance, radio and mechanical fields. Upon their effective functioning depends much of any community's health, safety, comfort and morale in a time when worn equipment is hard to replace.

mestic mechanical refrigerators, refer to CMP Regulation 9A, although repair materials for commercial refrigeration and air-conditioning may be bought under this regulation.

Solder

For the various kinds of solder, the percentage of tin content by weight, that may be purchased on certification for the maintenance and repair of refrigeration equipment, radio and radar equipment, electric motors and generators, and electrical appliances and equipment, refer to Schedule II of Order M-43

Repair Parts and Materials in General

No rating should be needed or used for most repair parts, as these are usually on a voluntary allocation basis from manufacturers to wholesalers to dealers and repair shops.

If a repair shop needs to obtain other-than controlled materials or other items or products that need and permit a rating, it should consult CMP Regulation 9A regarding the use of an AA-3 rating for civilian repair materials; and the way to be assigned an AA-2 rating for industrial repair materials.

The items on List B of Priorities Regulation No. 3 may not be obtained with blanket MRO ratings, such as the rating given by CMP Reg. 5 and CMP Reg. 5A. CMP Regulation 9A also states that its ratings may not be used to purchase any of those List B items; and, in additions lists certain civilian radio items that may not be purchased with the AA-3 rating assigned by that regulation. In an emergency, to get a rating for a List B item, file Form WPB-541 (formerly PD-1A,) with the nearest field office, or whatever special form the field office requests.

Repairman and electricians should note that there are certain kinds of work that may not do with materials

purchased under CMP Regulation 9A, such as supplying new connecting or attachment cords where the old ones may be patched or repaired; the

[Continued on page 44]

DEFINITIONS

CMP—Controlled Materials Plan Controlled Materials—This means steel—both carbon (including wrought iron) and alloy—copper (including copper base alloy), and aluminum, in each case only in the forms and shapes indicated in Schedule I which is included in CMP Reg. 9A.

V-3—Symbol of OCR's claimant program for retailer's copper wire and repairmen's materials.

OCR—WPB's Office of Civilian Requirements.

MRO—Stands for Maintenance, Repair and Operating Supplies. It may be used in some cases as an allotment symbol in connection with P orders and provisions of CMP-5 and 5A.

L-Order—A Limitation order. Use of the letter before a number indicates the class of order.

M-Order—A conservation order regulating the use of critical materials.

P-Order—A preference rating order.

E-Order—An equipment order.

PR—Priorities Regulation.

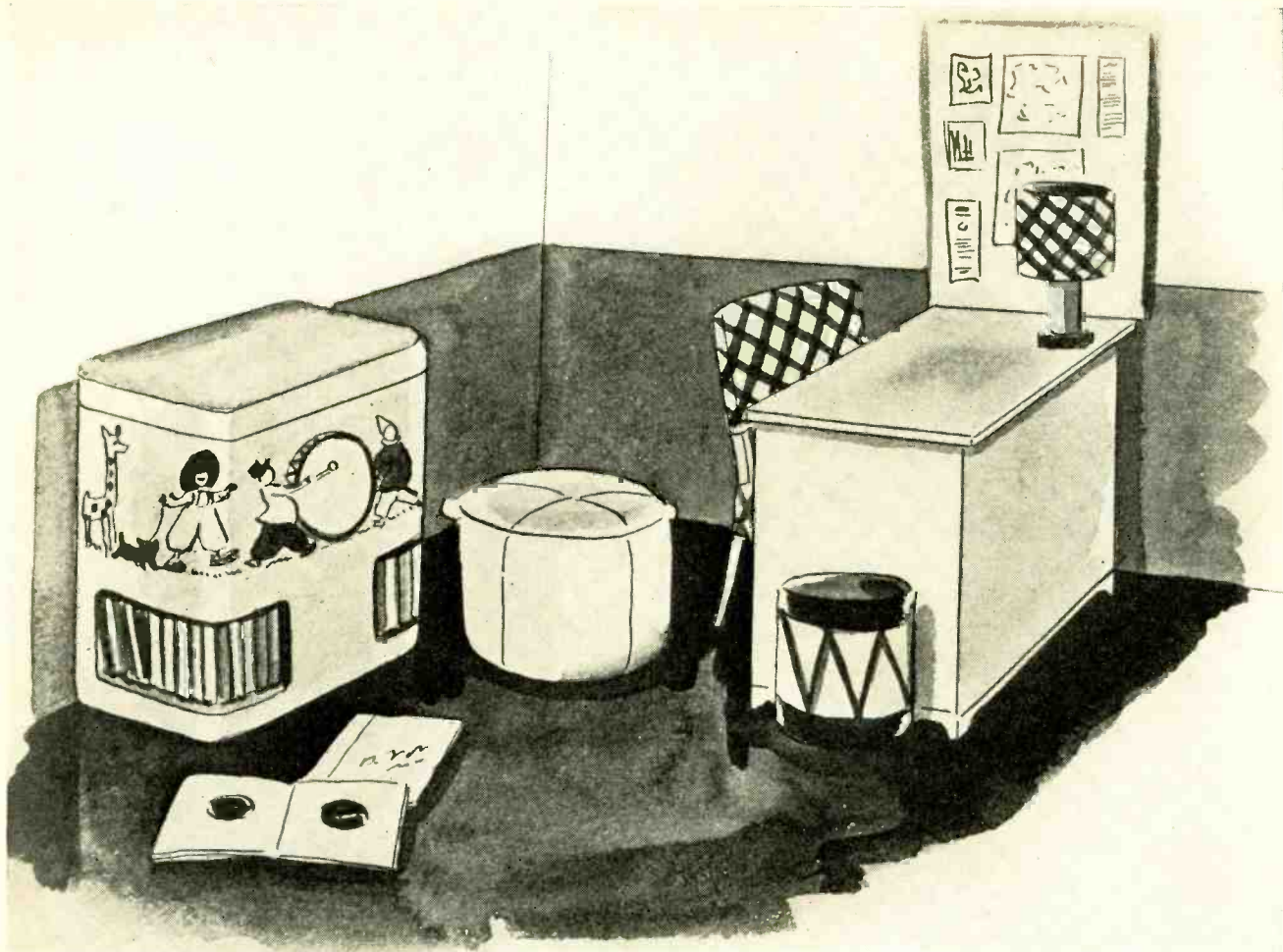
MR—Radio tubes—Tubes to be used only for civilian replacement purposes.

Form WPB-541—A form on which to make application for a preference rating.

Form WPB-3243—The form on which to apply for authorization to receive delivery of some kinds of electrical test equipment. It is used in connection with Order M-293.

Preference Rating—A rating consisting of a letter or letter and number which can be assigned to an order under some circumstances to indicate the standing which that order has in competition with other orders on the supplier's books. In other words, it indicates the priority of the order.

Certification—A statement indicating the essentiality of the applicant's need for the desired product, part, or material.



Illustrations from Radio Manufacturers Association

100,000,000 RADIO

THIS postwar buying forecast is presented as an accurate, unbiased picture of the nation's prewar radio buying habits and gives a cue to postwar expectations. According to Frank Mansfield, director of sales research, Sylvania Electric Products, Inc., the survey was conducted by one of the country's leading independent market research organizations. For a period of over four months interviewers traveled to homes of all income groups in large cities, small cities, country towns and farms from Maine to California in order to secure a fair cross section of American opinion. Sylvania's sponsorship of the survey was not even known by the interviewers.

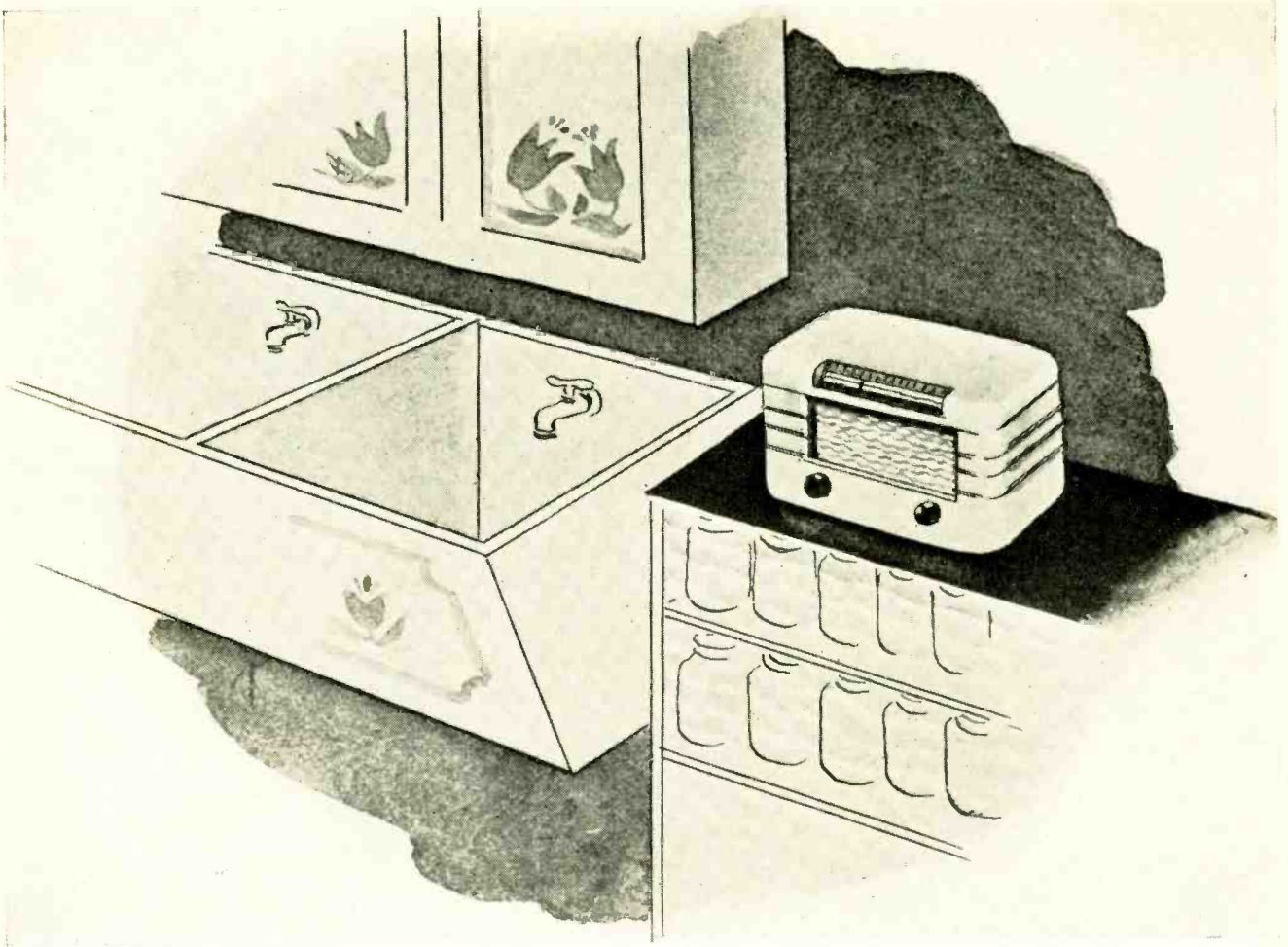
Impartial survey shows people want FM, Combinations, Television, Short Wave — and low prices. Two sets average per home predicted. Estimate over 20 million families will buy immediately new sets are available. Omits choice of modern or traditional styles, though.

ABOUT THE CUSTOMERS

Where they buy: Contrary to the popular American custom of looking over merchandise in a dozen stores before making a selection, Mr. and Mrs.

John Q. buy their radios in the first shop they visit two times out of three.

Set ownership: The 31,000,000 radio homes in the country now have an average of 1.54 sets per home. Not only



NUMBER II RADIO is the **NUMBER I CHIP** in the postwar stakes of manufacturers, distributors and dealers. Across: a possible special set for "small-fry". Above: stock model for small-fry's momma, to lighten hours she will spend in her enlightened postwar "sizzle-sanctum".

RECEIVERS WANTED

is there a steady increase in the number of people owning a radio but an equal growth in the number of families owning two or more sets is indicated. Mr. Mansfield predicts that when radios go into mass production again the average will rise to two sets per home.

Brand loyalty: In the past, radio buyers displayed little loyalty to the brand of radio already owned. Illustrating this, 63 per cent of the families who own three sets admitted that all three were different brands.

Trade-ins: While the average set is turned over every seven years, half the
 [Continued on page 26]

POINTERS ON THE RADIO MARKET

American families will buy a hundred million radio sets within the first 5 or 6 years after total victory. Two-thirds of the current population will order the first new sets on the market—preferably combination radio-phonograph models. How this total has been computed is explained as follows:

Thirty-six million families now populate the United States and the survey shows that over 83 per cent have home radios, totalling approximately fifty million sets. Once the war is over, the number of families will increase at the rate of a million a year for the following five or six years. Returning veterans will marry and set up new homes while others, already married but living with their parents, will set up house-keeping for themselves. All of them will want radios. Add to this the steady increase in home radio ownership apparent before the war, and the average turnover rate of seven years.

Simple arithmetic gives the seemingly startling total of 100,000,000 radios including automobile sets.

RADIO BUYING SURVEY CHART

HOW MANY RADIOS ARE THERE?

There are 36,000,000 families in the United States; 83.3% or 31,000,000 have home radios. Of these families

- 58.5% or 18,135,000 have 1 set
accounting for 18,135,000 sets
- 31.7% or 9,827,000 have 2 sets
accounting for 19,654,000 sets
- 6.9% or 2,139,000 have 3 sets
accounting for 6,417,000 sets
- 2.1% or 651,000 have 4 sets
accounting for 2,604,000 sets
- .8% or 248,000 have 5 or more
accounting for 1,488,000 sets

A total of 48,298,000 sets

And this does not include 8,000,000 auto radios, or the many sets in public and commercial locations such as hotels, restaurants, stores and the like.

HOW OLD ARE THESE SETS?

(as of October, 1944)

- 8.7% are Two Years Old
- 12.3% are Three Years old
- 18.0% are Four Years Old
- 31.8% are Five to Seven Years Old
- 16.8% are Eight to Eleven Years Old
- 12.4% are Eleven or More Years Old

WHAT TYPES OF RADIO SETS ARE NOW IN USE?

- 42.2% Table Models
- 34.9% Consoles
- 10.6% Midgets
- 5.4% Combination-Consoles
- 1.7% Combination-Table Models
- 5.2% Unclassified
(This includes no auto radios.)

HOW MUCH "SHOPPING" DOES A BUYER DO WHEN HE BUYS A NEW RADIO?

- 70.9% Bought in the First Store Visited
- 15.8% Shopped in Two or More Stores
- 6.6% Received as a Gift
- 4.2% Bought Second Hand
- 2.5% Bought from Miscellaneous Sources Including "Wholesale".

Most Americans believe in the honesty and integrity of the Radio Dealer.

WHAT WERE THE DECIDING FACTORS IN THE PURCHASE OF THE HOME RADIO MOST RECENTLY BOUGHT?

- 25.0%—Better Tone (Tonal Quality)
- 24.0%—Better Reception (Sensitivity, No Static, Clarity)
- 21.5%—Better Looking (Cabinet Work, Finish, Color)
- 17.0%—Short Wave
- 15.0%—Push Button Tuning
- 12.0%—Record Player
- 10.0%—Smaller Model (Portable, etc.)
- 7.5%—Larger Model
- 5.0%—More Tubes
- 33.0%—Miscellaneous

Total adds to more than 100% because most people gave more than one reason.

WHAT ABOUT BRAND LOYALTY?

As expressed by the brand of set purchased as compared to the brand of set replaced:

- 15.4% Bought the Same Brand as Previous Set
- 84.6% Bought a Different Brand

There seems to be no evidence of brand loyalty among radio set owners. This was found to be true regardless of the brand of set previously owned.

As further evidence—an analysis of the make of sets owned by families with three sets, we find—

- 5.8% of these families with all three sets of same brand
- 31.2% with two of the three sets of same brand
- 63.0% with all three sets of different brands

WHAT DO SET OWNERS THINK ABOUT "FEATURES" OF A HOME RADIO?

SHORT WAVE

- 52% Have Short Wave
- 48% Do Not

Of Those Who Have Short Wave—

- 9.9% Use Short Wave Frequently
- 16.9% Use Short Wave Occasionally
- 73.2% Use Short Wave Seldom or Never

Only about 5% of U. S. Radio Families listen to short wave programs regularly.

PUSH BUTTON TUNING

- 31% Have Push Button Tuning
- 69% Do Not Have Push Button Tuning
- How Well Does Push Button Tuning Work?
 - 78% Say "Satisfactorily."
 - 22% Say "Unsatisfactorily."

RADIO BUYING SURVEY CHART

WHAT DO RADIO OWNERS DISLIKE ABOUT THEIR SETS?

- 21.5%—Static, Too Noisy, etc.
- 20.8%—Model Isn't Right (Too big, too small, ugly, etc.)
- 15.5%—Tone or Reception Not Clear ("Doesn't play well")
- 12.6%—Something does not work well ("Short wave N. G."—"Record changer doesn't work," etc.)
- 11.6%—Range—"Can't get distant stations"
- 11.2%—Difficult Tuning (Can't separate stations", etc.)
- 8.8%—Volume ("Not powerful enough"—"Not constant")
- 8.2%—Features Missing ("No tone control"—"No push button")
- 24.1%—All others

Even when urged to think of complaints, only 47% of owners could think of anything wrong with their present radio. Total complaints add to more than 100% because some people interviewed gave two or more reasons.

WHAT DO RADIO OWNERS LIKE ABOUT THEIR SETS?

- 77.5% Say Tone & Reception are "Good," "Clear," etc.
- 51.0% Say Model & Style are Good ("Nice Cabinet,")
- 27.1% Like Features ("Tone Control," "Push Buttons," etc.)
- 8.5% "Tunes easily," "Separates stations well," etc.
- 8.0% Good Distant Reception
- 6.4% Well Made ("Few repairs necessary")
- 5.8% Good Volume
- 4.5% No Static
- 3.0% Like Particular Brand or Manufacturer
- 19.6% All Other Reasons

This represents an average of over two favorable comments for each person answering.

Of All Persons Interviewed

- 75% Have No Criticism of Their Latest Set
- 20% Said Latest Set Performed Fairly Well
- 5% Expressed Real Dissatisfaction

The high level of satisfaction is a mighty tribute to the Radio Manufacturing Industry.

WHAT ABOUT POST-WAR?

65%—(20,150,000) of the Families Will Buy a New Set When Radios Again Become Available.

Of These People

- 36.5% Say They Will Buy Radio-Phono Consoles
- 27.0% Say Consoles
- 20.7% Say Table Models
- 8.3% Say Radio-Phono Table Models
- 4.1% Say Midgets
- 3.4% Say Miscellaneous Types

This represents a gigantic market for the radio industry.

FREQUENCY MODULATION

- 91.3% Say They Will Want F. M.
- 7.3% (only one in fourteen) Do Not Want F. M.

- 16.5% Are Willing to Pay \$30 Additional for F. M.
- 27.5% Will Pay \$15 Additional
- 48.3% Will Pay \$10 Additional
- 70.1% Will Pay \$5 Additional

America is sold on F. M.—Is willing to pay for it. Less than 1½% of the people interviewed did not know what F. M. was.

TELEVISION

- 49.5% Want Television—Will Pay Extra For It.
- 29.3% Do Not Want Television
- 21.2% Are Undecided

- 3.2% Will Pay \$300 Additional
- 7.2% Will Pay \$200 Additional
- 20.4% Will Pay \$125 Additional
- 49.5% Will Pay \$75 Additional

This means that —

At \$300 over usual set cost—1,000,000 sets can be sold

| | |
|----------------|-------------|
| At \$200 | 2,200,000 |
| At \$125 | 6,100,000 |
| At \$ 75 | 15,000,000* |

*Provided that telecasting stations are within range and program quality is acceptable.

THE RADIO INDUSTRY HAS A GREAT OPPORTUNITY

to give the American public even greater radio enjoyment. An opportunity to raise the volume of its business far above any level heretofore known.

WHAT DO WE KNOW ABOUT HOME RADIOS?

The Radio Manufacturing Industry has been one of the most successful of all those serving the American public. Year after year it has met the challenge of keeping pace with the country's number one source of entertainment and information. But, in the post-war period, it will be necessary for us to do an even better job of giving the public what it wants. It is to determine these wants, by going directly to the people, that this and other impartial surveys are being conducted.

radios now in operation are between four and eleven years old and their owners have little to say against them. Only 5 per cent expressed any real dissatisfaction.

Why they buy: Asked what they like about their sets, owners had this to say, in the order mentioned: Tone and reception are good on over 75 per cent of the sets; half the owners are pleased with the models and styles, like the tuning, get good distant reception, get good volume, little static.

"This represents an average of over two favorable comments for each person answering and speaks well for the radio industry," said Sylvania's spokesman. "Even when urged to think of complaints only 47 per cent could think of anything at all wrong with their present radios."

ABOUT THE SETS

Frequency Modulation: This will be a big selling factor, with over 90 per cent of the people looking forward to it. A small group would be willing to pay \$30 extra for FM, half those interviewed would pay an additional \$10; the majority of listeners would prefer to pay only about \$5 for the clearer reception possible with FM.

Television: Provided that telecasting stations are within range, and program quality is acceptable, the public think they will buy 15,000,000 television sets at \$75 over the usual cost of a radio set. Mr. Mansfield pointed out, however, that this group may be disappointed. "It looks as if good television reception," he said, "will cost anywhere from \$125 to \$200 extra. But it is entirely possible, that within a few years after introduction on a large scale, television will be low enough to meet majority acceptance.

"Survey results show that at present only a little over three per cent of the people will pay \$300, and under thirty per cent want to see television programs if it adds \$125 to \$200 to the cost of the set. Remember though," he warned, "this is only a reflection of what people think they want."

Short Wave: Home radio owners are divided almost equally among those who have short wave facilities and those who do not. "Even those who have short wave and don't use it will want it on their new sets," declared Mr. Mansfield. "They won't use it any more than they do now, but they'll want it to be there just in case, and to show to their friends." At present only about 5 per cent of U. S. radio families listen to short wave programs regularly.

Push Buttons: Push button tuning is fairly popular. Of the 31 per cent that

have it, three quarters like it, the rest report unsatisfactory service, which indicated, according to Sylvania, a need for considerable improvement on this type of tuning.

WHAT DEALERS MAY OFFER

As soon as radios become available, over 20,000,000 families will buy new ones. Over 46 per cent say they want radio-phono models, the majority preferring console styles. Analyzing these figures, Mr. Mansfield declared that they show a trend toward one basic model for each home and additional small sets in other rooms—kitchen, bedroom, playroom and the like.

First ten of the brands now in use rate in the following order, according to survey figures: Philco, RCA, Zenith, Emerson, Silvertone, General Electric, Crosley, Majestic, Air Line, Stewart Warner.

WARTIME SURVEYS AND POSTWAR SALES

A WARNING against over-optimism is contained in the following comments by William H. Kelley, general sales manager, Galvin Manufacturing Corporation:

The time has arrived for all of us in the radio business to take off our rose colored glasses and look at the post-war radio market with jaundiced eyes. Our mouths have been watering with the thought of gorging on the luscious meal of radio prospects cooked up by the optimistic reports of one survey after another.

I don't mean to say that any particular survey is incorrect or that at the time the persons were interviewed they didn't put radios near the top of the list. But here's the rub. Note, that I say, "At the time they were interviewed." For this matter of time and circumstance is the all important element in analyzing any survey.

There is no doubt about the shortage of radios and household electrical appliances throughout the country. There is also no doubt that there is a tremendous potential market for these articles. But at the time these surveys were taken, there was full employment. In countless cases, several members of one household were employed. They had cash in the bank, in their pockets and weekly pay checks were due. It was only natural therefore for all those interviewed to be most definite and

positive about the first things they would buy when these articles were again available.

Often, the results of the surveys indicated that well over a thousand dollars would be laid on the line by one family for different household articles including radios. To my mind that does not give the true post-war picture. There are too many Americans who remember the terrible thirties. They will not strip their bank accounts bare to purchase, in one lump or one at a time, a radio, washing machine, dish washer, new refrigerator, and other household appliances, let alone a new automobile and a home in the country.

Time and circumstance in the immediate post-war period will unquestionably change and undoubtedly limit what those surveyed will buy to a fraction of what they intended to buy at the moment they were surveyed. At the same time, the list of what they want to buy will probably remain the same and in this list of "wants" is our potential post-war market.

Only with the proper distributor facilities and a profitable, workable set-up for dealers, along with quality merchandise backed by comprehensive national and trade advertising, sales promotion and servicing, will the radio and appliance industry capture and hold its share of the highly competitive post-war consumer goods markets.

Lining Up The Customers

by **JOHN MECK, President,**
John Meck Industries

Dealer is the hub of entire merchandising network. Point-of-sale displays, national and trade advertising offered by manufacturers prepare radio and appliance dealers for unprecedented postwar sales.

THE story of the Radio Industry in supplying radio and electronic equipment for our Armed Forces has been told many times. Although still involved one hundred per cent in war work, the industry has been looking forward to forthcoming postwar retailing problems. The problem of merchandising their products has always been of first importance and there is no doubt that it will be more so in the highly competitive period to come.

The prewar method of employing a vast spiderweb-type network of distributors and dealers for marketing home receivers will be followed, as it has in the past, by the Radio Industry. The majority of radio manufacturers depend upon this manner of distribution in marketing their merchandise. Each manufacturer individually sets up a group of jobbers throughout the country, who in turn have their own distribution mediums through independent dealers.

Through the medium of these independent dealers, radio manufacturers retail their products under their trade names and are dependent upon the salesmanship and the ability of the dealers in their network to sell their particular lines. In order that any radio manufacturer maintain a profitable enterprise, he must endeavor to set up a network of dealers that are progressive and have ability to conduct a profitable business. The dealer who actually contacts the consumer is the hub of the entire merchandising network.

Active Dealer Promotions

Some manufacturers are more aware of this fact than ever before and are preparing methods of aiding their dealers, in every possible manner. Pos-

ters and booklets of various forms are appearing in dealer display windows; installation of FM and television equipment will be forthcoming; means of instructing dealers on new techniques are being planned, all of which indicates that manufacturers will endeavor to aid their dealers in marketing their products, to the advantage of all concerned.

Manufacturers are embarking on elaborate advertising campaigns to publicize their products. In this manner they are helping the individual dealer to prepare his future market. When home receivers once again begin to roll off the production lines, the independent dealers will be in a far better position to conduct a profitable business than ever before in the history of the Radio Industry.

The first sets sold will be improved 1941 models. However, many new consumer markets will be opened, particularly in the fields of FM and television. As of October 1, 1944 there were 248 construction applications on file for new FM stations. The Federal Communications Commission has issued a proposed new frequency allocation for the entire radio-frequency spectrum. If these new frequency allocations are accepted as proposed, FM will be shifted from the present band of 42-52 mc to that of 84-102 mc. In many cases old FM receivers can be converted for reception on the higher frequencies; and many of these receivers now in the hands of consumers will no doubt be replaced with the new, improved postwar models.

Television will not become a total national retailing market for several years to come. However, about the time that radio manufacturers have caught up with consumer demands for

standard home receivers, television will come to the front and add a tremendous new market for the industry. This market will be larger than ever seen before in the radio industry.

Along with the above, the independent radio dealer actually will be in a more advantageous position to retail his merchandise. The public has become more local-minded and no longer shops around from store to store to obtain bargains. In many cases he will not spend travelling time to shop in large department stores. He has found that the local dealer in many instances has more merchandise to sell than these larger stores. This has been the general trend of public buying and will continue to be so for some time to come.

Service Builds Sales

This trend has given the independent dealer every opportunity to become acquainted with his customers, which is an important factor in continuing a profitable enterprise. He has been able, through his many repair jobs, to obtain by now a list of all his customers, who will be in the market for home receivers as soon as they are available.

In many localities, the dealer has been the only one in a position to repair home receivers. This has given the dealer an additional advantage over the mail order houses and chain stores, who, in the last three years, have lost contact with part of the radio buying public. The local dealer will always continue to have this advantage over the larger merchandising organizations, as in making personal calls he can invariably sell more sets to his customers.

In view of the large amount of expected competition between the independent dealer and the larger retailing organizations, the independent dealer has accumulated a considerable edge in merchandising his postwar products. He must maintain this edge by continually keeping up with all current trends and new radio techniques so that he can continue to maintain his position in the Radio Industry.



Displays Service Jobs

SHELDON POWELL'S radio shop in Watertown, N. Y., is divided into two sections—a "reception chamber" (formerly the radio and appliance sales room) and the service "sanctum" proper. He keeps his shop phone within easy reach on the service bench (see illustration). This saves time and energy—both of which Powell needs more than ever to handle the steadily mounting number of radio receivers that break down in use and which their owners bring in hopefully for servicing.

The door connecting the service shop with the front part remains open so that Powell can come out to meet his customers, rather than chance having them "invade" the workshop. This, too, is a time-saver. There is a counter in the front part of the store (yes, the ex sales-counter) at which are now ticketed the sets brought in for servicing. While waiting their turn at the

A phone and an open door save this dealer time and energy to handle increasing volume of service jobs.

bench, portable or table models are placed in a rack of shelves (formerly dedicated solely to the display of new models), while consoles (brought in or picked up) are clustered on the floor near them.

All of which goes to show how important radio receivers are to the people of this country. Radio sets that may have been taken brand new from the very same spot in the dealer's store at the time of purchase, are now on "display" again. As the reader will see in the illustration, this set-up looks like a pre-war dealer display.

The service and job tags might easily be taken for the "sold" tags of old.

While this "stock" represents service business only, it is an indication how readily and conveniently thousands of radio and appliance dealers throughout the country can "reconvert" to handling and selling all those new models promised by manufacturers, when reconversion becomes the order-of-the-day.

Rations Jobs

Powell, in common with other service dealers, finds it necessary to im-



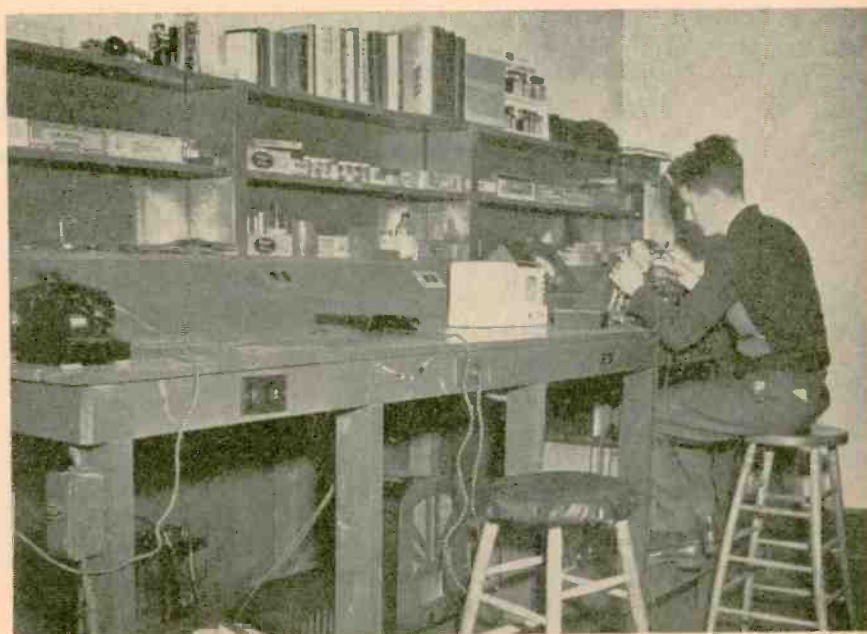
by **WILLIAM TONER**

What a service dealer does with his store space: The "back room" is used exclusively as a workshop. The radio set display space of yesteryear in the "front" now houses consoles, combinations, midgets, personal and table radio receivers as sets sold new from the same spot show up again for servicing.

pose some form of rationing when dealing both with potential service or tube customers. Some of the tubes on display may be sold over the counter, but most of them are reserved for his own use in set servicing.

But such is the stringency of tube supplies, that much as he would like to handle all the jobs that come in, Powell has found himself urging some customers not to service or buy tubes for say, their bedroom or kitchen radio receivers, if they have a main household set which is working satisfactorily, or which can be fixed so it will.

This method, openly operated and frankly discussed with customers, helps Powell to "butter" his supply of tubes and components thinly but adequately over a larger number of families with radio set troubles. And this means good will is maintained with more of his future customers.





HERE COMES—

Brilliant projection image in development model of home receiver produced with optical system projecting six times more light, plastic viewing screen and automatic frequency control. May sell for \$400.

AN advanced development model television receiver reproducing pictures that are brighter, clearer and five times larger than were obtainable on pre-war sets was demonstrated recently in Radio City by the RCA Victor Division of the Radio Corporation of America, with the cooperation of the National Broadcasting Company, its subsidiary.

A special program of live talent and films was viewed on the receiver model, which features a new type of screen,

16 x 21 1/3 inches, made of surface-treated plastic. Technical details of the receiver were explained by Dr. C. B. Jolliffe, Vice President in Charge of the RCA Laboratories. John F. Royal, NBC Vice President in Charge of Television, discussed programming.

THE SHOW

Bill "Bojangles" Robinson headed the list of entertainers on the half-hour show. The veteran tap dancer was

followed by a dramatic sketch, "Birthday," featuring Jimsie Somers, 8-year-old television actress; Frances Dee, Philip Foster, and Ed Jerome, all well known to stage and radio. A film of athletes in action and official motion pictures of the U. S. landings on Corregidor were shown. The program concluded with a parade of models under the direction of Russell Patterson.

According to Frank M. Folsom, vice president in charge of the RCA Victor

Division, television sets of the type demonstrated will not go into production until wartime restrictions on manpower and materials are removed. He said that the company expects to make large-screen receivers available within about one year after civilian production is resumed.

Console models, containing projection-type television, FM and standard broadcast receiving facilities, Mr. Folsom added, will cost approximately \$395. RCA Victor will also have several models equipped with direct viewing picture tubes, and at least one table model priced at about \$150.

THE SET

The size, brilliance, clarity, and steadiness of images, reproduced by RCA Victor's advanced development model large-screen home television receiver are made possible by four separate technical developments, the basic principles of which were developed by the engineers of the RCA Laboratories and the RCA Victor Division before the war.

1. A reflective optical system which collects from the image on the receiving tube and projects onto the viewing screen about six times as much light as could be delivered from tube to screen by a conventional F:2 movie



Version of a post-war radio and television receiver for the home, as envisioned by Jacques Martial and Robert C. Scull, of the firm of Martial & Scull, industrial designers. Screen is mounted within a shadowbox type of hood, which will tend to eliminate extraneous light in the average room. Dial and piano key tuning arrangements and all appointments below the screen are finished with a nonreflecting and non-specular varnish. One side of the cabinet houses a phonograph, the other side provides storage space for records and albums.

Opposite: How the projected television image will appear—not how the set will look. A development model, it is an un-styled enclosure for the elements thus far developed which promise to bring the television set to perfection for the mass market. Image is visible in ordinary living room with average lighting.

TELEVISION ...

projection lens, without loss in image quality.

2. A built-in translucent plastic viewing screen with molded surfaces designed for even distribution of light over the area of the screen, and distribution of transmitted light within the normal viewing angle.

3. An automatic frequency control system which virtually eliminates picture distortion caused by interference from automobile ignition and other noise impulses.

4. A new high-voltage type of cathode ray tube which produces a brilliant initial image on the face of the cathode-ray receiving tube.

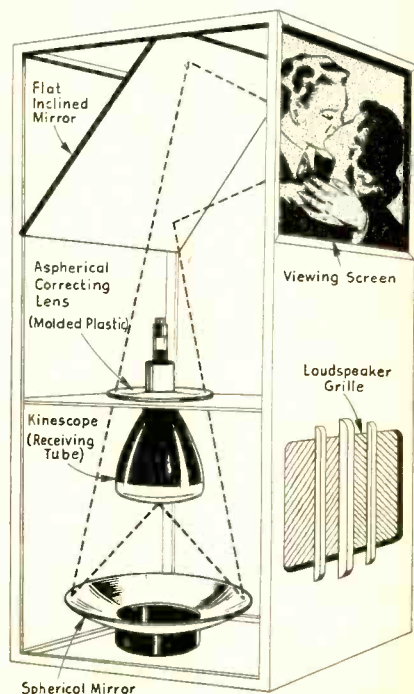
The Optical System

The optical system, which was developed by RCA Laboratories engineers before the war, consists primarily of a spherical front surface mirror

and an aspherical correcting lens. The mirror may be visualized as a shallow bowl, with its reflective coating on the concave surface facing the light source. The lens is flat on one side, with the opposite surface rising slightly at the center and at the edges, but depressed in the intermediate area.

The system is mounted with the image end of the receiving tube facing downward through an opening in the center of the lens and facing the center of the mirror. Images appearing on the face of the tube are picked up by the mirror and reflected through the aspherical lens to the back of the viewing screen.

The great light-gathering power of this optical system makes it possible to transfer to the viewing screen a large percentage of the light produced on the face of the tube, whereas the efficiency of a conventional projection lens in such an application is extremely



low. The function of the aspherical lens is to bring the light reflected by the mirror to a sharp focus on the screen. A major obstacle to the development of the system was the time and cost involved in making aspherical lenses from glass. RCA engineers solved the problem by devising methods and equipment for molding the lenses from a transparent plastic material.

The Viewing Screen

Two different optical problems have been overcome by special features of the new translucent viewing screen developed by RCA. One problem faced by the designers was a tendency which the screen would normally have to develop a "hot spot", resulting in a glare in the center and insufficient light in other parts of the image. The other problem was the need for distributing a major portion of the transmitted light to the area which the spectators would occupy in relation to the receiver. Solutions were found in

a combination of principles which have been incorporated in the molded design of the screen assuring both even distribution of light over the image and a proper distribution of transmitted light within the normal viewing angle.

Automatic Frequency Control

RCA's automatic frequency control discriminates between the transmitted synchronizing impulse and any stray noise impulse, which otherwise might trigger the sawtooth wave voltage prematurely, by fixing a time interval for the former and shutting out impulses which do not arrive on schedule.

Without some such control, noise interference could throw the scanning beam in the receiver out of synchronization with the one in the transmitter, causing the former to "black out" and return on some lines of the picture before they were completed. "Tear outs" and ragged edge effects would result. Preventing this form of distortion, the RCA system regulates

reception in somewhat the same way that a flywheel regulates machinery.

High Voltage Cathode Ray Tube

The high voltage cathode ray tube used in the RCA Victor large-screen home television receiver is substantially smaller and lighter in weight than the pre-war direct-viewing picture tube. This means smaller, lighter, and less costly home receivers, and may mean lower tube replacement costs.

Designed to operate at a rated voltage of 27,000 volts—nearly four times the voltage used in pre-war picture tubes—the new tubes produce a much brighter initial image. This high initial brilliance, in conjunction with the efficiency of the optical system, makes it possible to obtain from a tube with a face diameter of only five inches a bright, clear image on the screen that is more than five times as large as could be produced on a pre-war direct-viewing tube with a face diameter of 12 inches.



The occasion: talk by Tom Joyce before Boston Conference on Distribution. The subject: influence of television on postwar distribution. The men (l. to r.): D. Bloomfield, conference director; Tom; Congressman J. W. McConnell, Mass.; Dr. H. H. Kong, China Finance Minister; Senator Leverett Saltonstall, Mass.

TELEVISION MERCHANDISING LOOKS AHEAD

TOM JOYCE, who resigned recently from his position as General Manager of the Radio, Phonograph and Television Department of the RCA Victor Division of RCA, is acknowledged as an authority on the postwar

commercial development of both home and theatre television. His work in this field is recognized by the industry as a leading factor in the upsurge of interest and activity in television during the past year and a half.

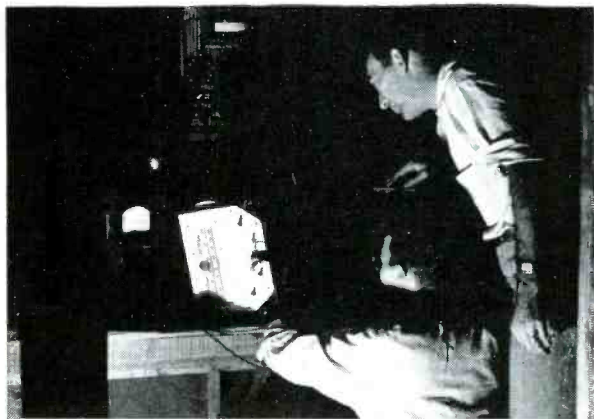
In November 1943, when Mr. Joyce outlined the detailed pattern of postwar television development before a combined meeting of the Advertising Club of New York and the American Television Society, there were but 7 applications for commercial television licenses on file with the Federal Communications Commission. Today, fifteen months later, there are more than 100 applications.

A major share of the credit for this rapid increase in television license applications is given to Tom Joyce and 22 large meetings of sales, advertising, distribution and business leaders in key cities, before whom he elaborated and substantiated his views on television's postwar development, with emphasis on its role in distribution and employment.

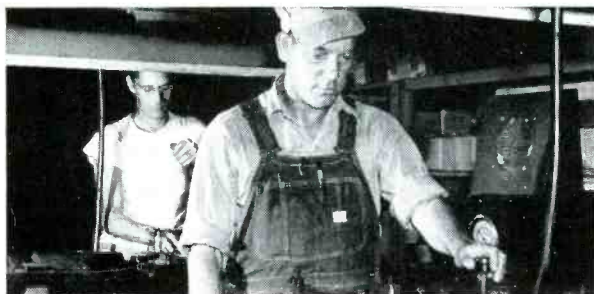
Mr. Joyce's particular enthusiasm for television dates from 1939. At that time RCA television receivers had been on the market for five months, and total sales were less than 150 receivers, when he was placed in charge. In a merchandising test, which took place under his direction in Newburgh, N. Y., the company succeeded in selling 100 television receivers at a price of \$395 each, within ten weeks, where only one receiver had been sold in the previous six months. This merchandising demonstration gives us a foretaste of things to come, especially when the intra-industry controversy and the hearings before FCC on television standards are finally ironed out.



Skilled fingers check every connection before this Meissner electronic equipment leaves Mt. Carmel, Ill., its destination —“Somewhere with the Armed Forces.” This “precision-eering” may make the difference between a successful military operation or a defeat, and Meissner’s “precision-el” are working for victory.



Precision testing in Meissner Laboratories proves the precision quality of the work of Meissner “precision-el.” It means new highs in performance when you specify Meissner precision-built electronic equipment for your product.

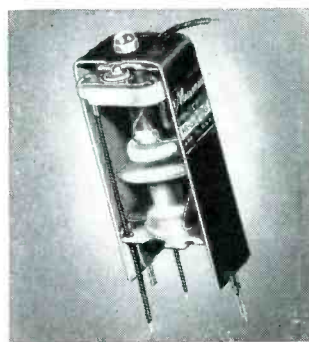


Concentration on the production of finer electronic equipment is characteristic of the men and women of Meissner. This devotion to quality production makes “precision-eering” out of even the most routine jobs — gives even greater skill to technicians like these.

THIS IS PRECISIONEERING by Mt. Carmel’s famed “Precision-el”

Precisioneering isn’t just another word for precision quality. It means that pride and skilled craftsmanship are represented in every product. To the men and women of Meissner, precisioneering means that they are maintaining the same high standards of workmanship that earned them the name “precision-el”—highest standard of an exacting industry.

To you, the users of Meissner precision-built electronic equipment, it means that these precisioneered products give you added quality, greater dependability.



“Step Up” Old Receivers!

These Meissner Ferrocart I. F. input and output transformers are getting top results in stepping up performance of old worn receivers. Special powdered iron core permits higher “Q” with a resultant increase in selectivity and gain, now available for frequency range 127-206. Ask for numbers 16-5728 input, 16-5730 output. List \$2.20 each.



MEISSNER

MANUFACTURING COMPANY • MT. CARMEL, ILL.

ADVANCED ELECTRONIC RESEARCH AND MANUFACTURE
Export Division: 25 Warren St., New York; Cable: Simonrice

Burden of repairing and recalibrating privately owned test equipment rests with radio service dealers themselves as manufacturers engage in full-time war work.

HOW TO RECALIBRATE

PART I

AT this writing practically all manufacturers of radio and amplifier service test equipment are engaged full-time in war work. Time and facilities for any but the most essential civilian business are very limited, when they are to be found at all.

In this article, we will outline the various comparatively simple calibration sources or means which are available to most owners of service test equipment in the present emergency. Each of the sources or methods described offers sufficient accuracy for all service purposes and some general experimental purposes as well.

The instruments which the serviceman and experimenter usually need to calibrate include r.f. oscillators, audio oscillators, voltmeters, ammeters (in-

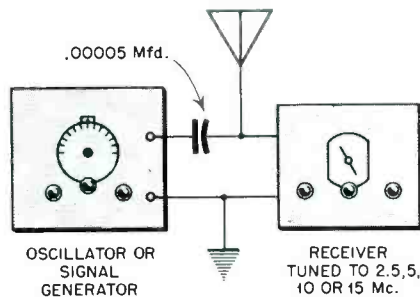


Figure 1

cluding milliammeters and microammeters), ohmmeters, microfarad meters, and small bridges (for resistance, capacitance, inductance, or any combination of the three).

R. F. Oscillators

WWV Signals. For checking r.f. oscillators of all types, the finest generally available standards are the standard frequency transmissions from the National Bureau of Standards station, WWV. These transmissions are broadcast from the vicinity of Washington, D. C. on 2.5 Mc (7:00 P.M. to 9:00 A.M. EWT), 5 Mc. (continuously day and night), 10 Mc. (continuously day and night), and 15 Mc. (continuously daytime at Washington only).

Each of the signals carries two audio-frequencies simultaneously; 440 and 4000 cycles per second, except the 2.5 Mc. transmission which is modulated only at 440 cycles. The accuracy of both carrier and audio components is better than one part in tenmillions.

The frequency calibration of r.f. oscillators may be checked directly against WWV transmissions by coupling the oscillator to the standard-signal receiver and zero beating harmonics of a number of oscillator dial frequencies against one of the standard frequencies (See Fig. 1).

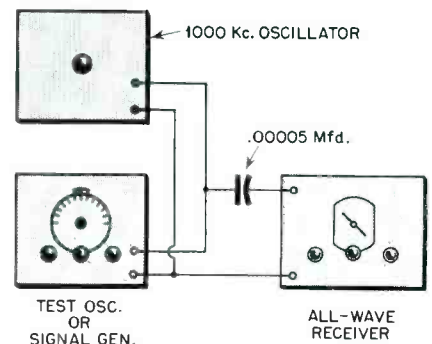
The highest oscillator frequency which may be checked directly in this manner is equal to the standard frequency. Frequency points beyond this limit are reached by means of an auxiliary standard-frequency oscillator (See Fig. 2).

The auxiliary oscillator, circuit schematics for which are given in Figure 3, is first set exactly upon 1000 kc. by bringing its fifth harmonic to zero beat with the 5-Mc. WWV signal, its tenth with the 10-Mc. signal, or its fifteenth with the 15-Mc. signal. The auxiliary oscillator will then provide spot frequency calibration points ex-

COMMUNITY STANDARDS

It is suggested that, whenever possible, all of the servicemen and experimenters in one locality share the expense, labor, and skill necessary to acquiring standards and making calibrations. The calibrating equipment thus becomes group property available to any member desiring to calibrate his equipment. In this way, we believe each individual may benefit by the immediate availability of good standards and that strain on equipment manufacturer and customer alike may materially be reduced.

Figure 2



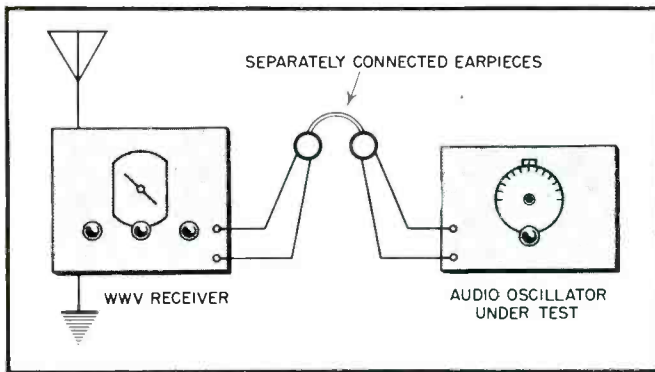


Figure 4

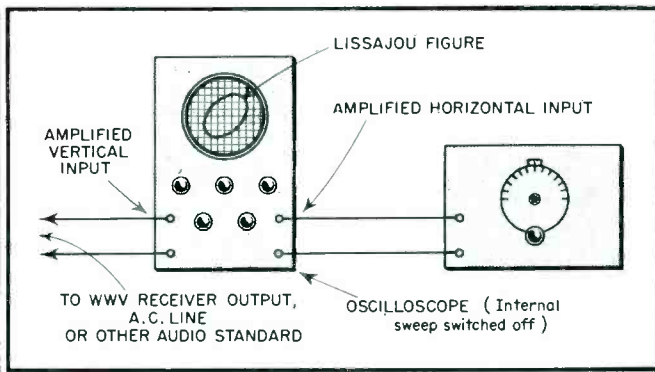


Figure 5

SERVICE TEST EQUIPMENT

by **ENGINEERING DEPARTMENT.**
Aerovox Corporation

actly 1 megacycle apart. The test oscillator dial points may then be checked with the receiver by zero beating against these spot frequencies.

Broadcast Carriers. In the absence of WWV signals, the i.f. and broadcast ranges of a test oscillator may be checked with good accuracy by zero beating dial frequencies against broadcast station carriers. The latter are maintained well within the legal tolerance of plus or minus 20 cycles and therefore serve as good frequency standards. For best accuracy, zero-beating should be carried out during "quiet" intervals when the carrier is free of speech and music.

Audio Oscillators

WWV Signals. Audio oscillators may be checked at two dial points (440 and 4000) directly by reference to the tone modulation on WWV standard frequency signals, and indirectly by referring harmonics and subharmonics of 440 and 4000 c.p.s. to the WWV modulations by means of Lissajou's figures.

The WWV broadcasts are modulated simultaneously at both 440 and 4000 c.p.s. except the 2.5-Mc. carrier which is modulated only at 440 cycles. In order to receive the higher frequency, the receiver must be detuned slightly to either side of center of the carrier frequency.

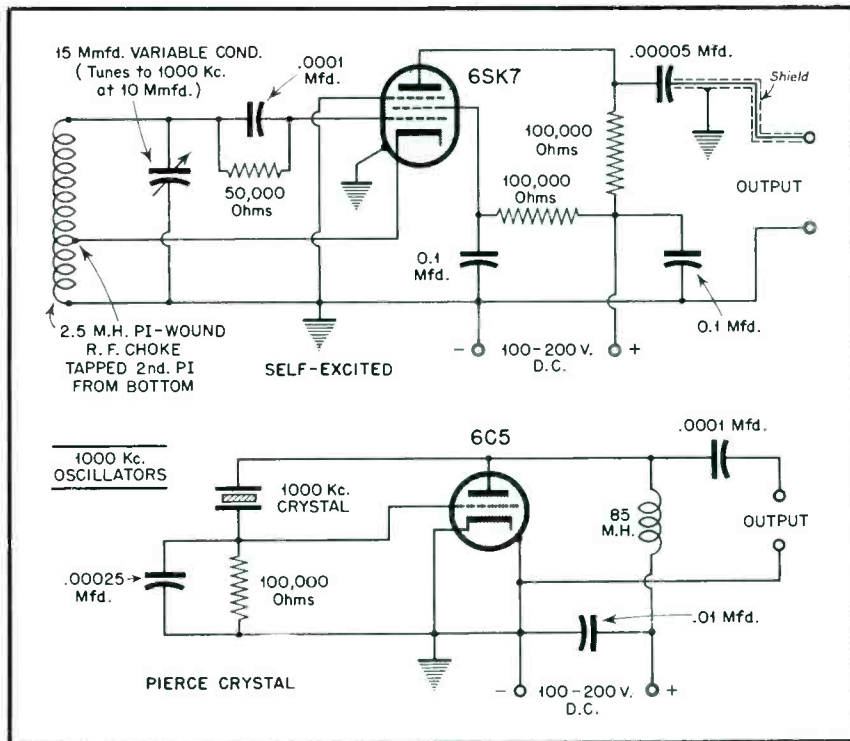
The comparison audio frequency may be delivered by a loudspeaker or headphones and the audio test oscilla-

tor output (delivered into a second speaker or headset) compared aurally by setting the variable unit to zero beat (Figure 4). Or the comparison may be made oscilloscopically, as indicated in Figure 5. A stationary circular pattern on the screen shows that the test oscillator is set to the standard frequency. A double circle (figure "8" pattern) indicates that the oscil-

lator frequency is at 2nd harmonic of standard frequency, etc., etc.

AC Line. The ac power line (25, 50, or 60 c.p.s.) is another radio calibration source which by itself will suffice in some cases. One test oscillator dial point (the one corresponding to the line frequency) may be calibrated directly against the line by the methods shown in Figures 4 and 5. Test oscillator frequencies in harmonic relation to the line frequency may be referred to the same source by means of an oscilloscope arranged for Lissajou's figures. [To be continued]

Figure 3



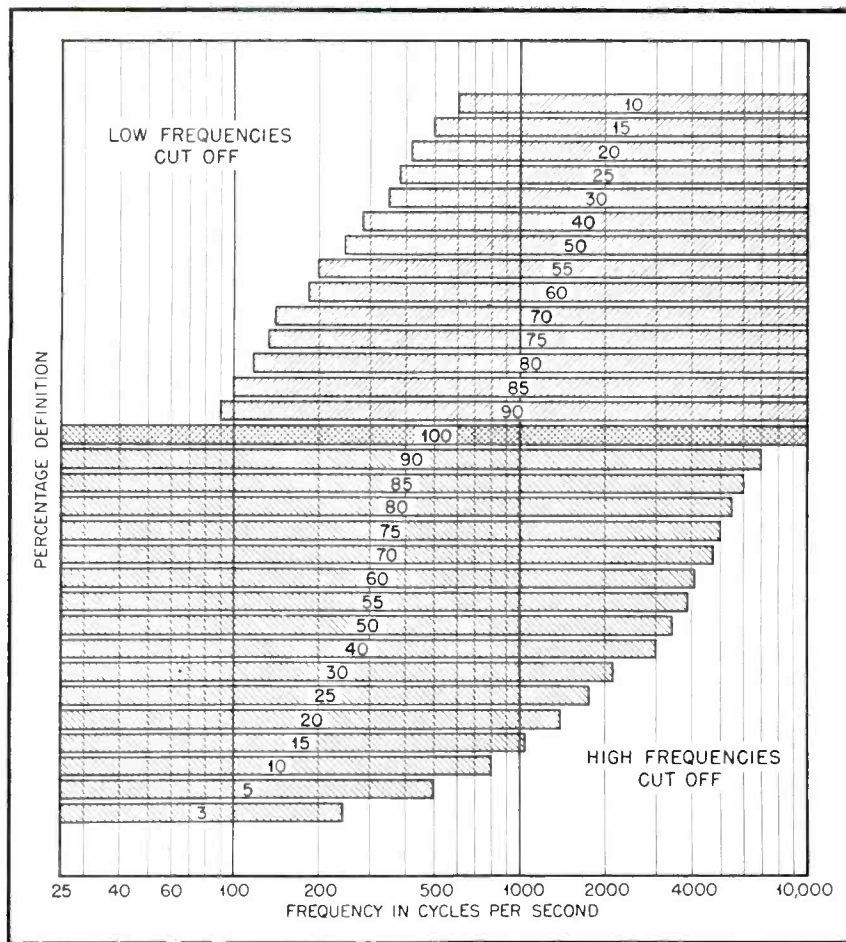


Figure 1.

Sound System Applications

IN selecting the parts of a sound system there are certain considerations which are applicable to all. These will be discussed first, and from then on it will be assumed they apply to the individual units mentioned.

Continuous operation is the rule with industrial sound systems. They are turned on in the morning and run without stopping throughout the work day. In many cases this is a twenty-four hour period and thus the system never gets a rest. Like everything else in this world, sound systems are subject to a certain amount of wear and tear through use. Components which were not designed for continuous operation may perform very satisfactorily for intermittent use—a few hours at a time. They usually fail miserably, however, when called upon to function as a part of an industrial sound system.

Breakdown of the system not only

Based on a study sponsored by the Industry Advisory Committee for Industrial Sound Equipment and the Radio and Radar Division of the WPB.

| DESIGNATION | SOURCE OF SOUND | ULTIMATE DESTINATION | FUNCTION AND COMMENTS |
|-------------------------------|--|---|---|
| 1. PLANT NETWORK a. Paging | Telephone -or special paging-operator | One or more areas of plant. Selective control of destination is desirable | Locating personnel |
| | Paging operator or strategically placed microphones with automatic priority or "sequence" circuits | Ditto | Fire, damage, and accident control |
| | Paging operator, or special microphone for executive | Ditto | Replaces or aids bulletin board for messages pertaining to plant operations |
| 2. INTERCOMMUNICATION | Strategically placed microphones Message source not limited to single location | Ditto | Highly specialized use of sound system, involving principle of talk-back. Not generally combined with other uses. Used for coordinating manpower and material flow, or interdependent operations as in steel mills, power plants, etc. |

All items on this table involve the transmission of SPEECH only

results in inconvenience but may be responsible for serious damage. Therefore, ruggedness and oversized parts are requisite.

All units, particularly controls, must be as foolproof as possible. The persons called upon to operate the system may not know a patch cord from a soldering iron. Therefore, there must be no chance of damage to any parts by throwing a switch in the wrong direction. The system must be protected from possible harm from curious or careless individuals. And vice versa.

All portions of the system must live up to certain fidelity requirements. Speech can be intelligibly reproduced over a limited frequency range of 300 to 3000 cycles per second.

Music transmission requires a broad band of frequencies. This is not to delude the workers into believing they are hearing the real thing and that the plant has put an orchestra on the payroll. The reason for fidelity in a plant is based upon a more potent consideration than aesthetic appreciation.

When music is played in a noisy background many of the tones are *masked*. Increasing the loudness of the music will overcome this effect but might make it a source of annoyance. Broadening the frequency band is a better way to add definition. Reduction

of music intensity is possible and is a desirable result. The effect of frequency range on music intensity for minimum acceptable definition can be seen in Figure 2, for a particular case. The shaded area shows the envelope of the noise background.

The chain of a sound transmission system is no stronger than its weakest link. If any element fails to reproduce the desired frequency range, the whole system is reduced to that level. Maximum ranges ever needed are 90 to 8,000 c.p.s. for speech, 30 to 16,000 c.p.s. for music. Losses due to reduced frequency range can be determined from Figure 1. Experience has indicated in all fields of reproduced sound that the restricted frequency range is never as satisfactory as the wide range. Though many potent arguments are put forth in favor of the former, all development tended toward increasing the range. Increased fidelity entails increased costs. A balance between price and effectiveness of the system is governed by the circumstances of each installation.

Studio Treatment

Some thought must be given to the acoustics of the room or studio where live sound originates. Singing in the

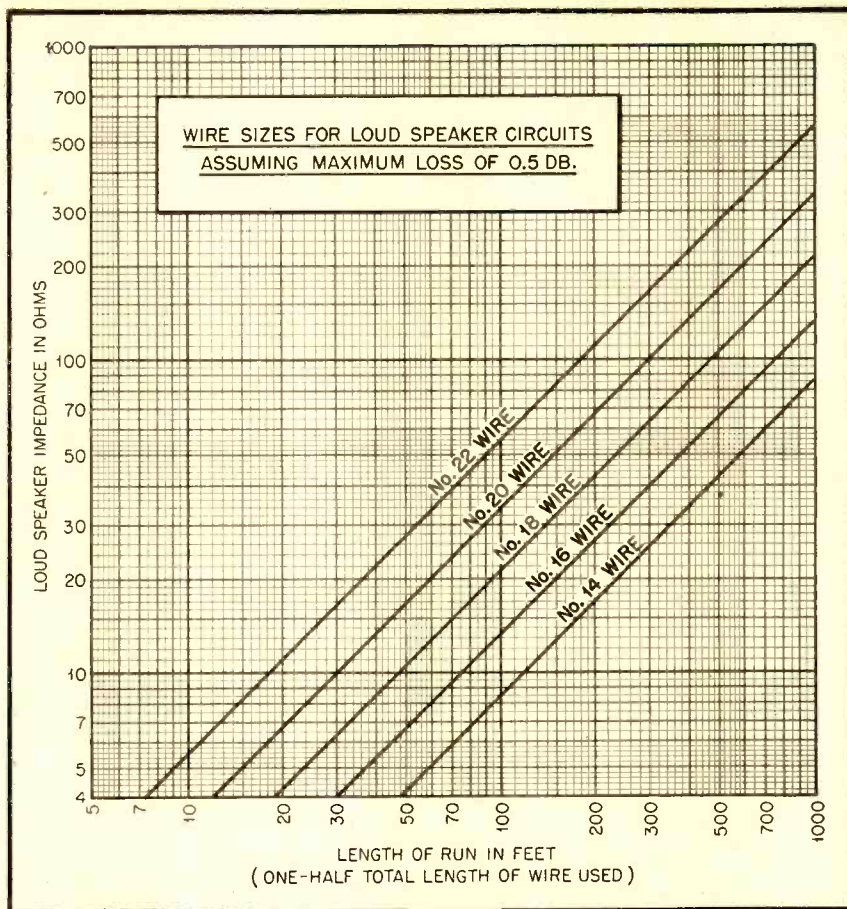


Figure 3.

PART I.

Industrial sound grows in five years from two uses to a total of twenty tested and proved applications.

bathtub is a great American pastime. The effect of the sound bouncing back from hard walls is very satisfying to the artist, both professional and amateur. Not so to others, however, particularly when reproduced over a sound system. Absorptive material placed on floor, walls and ceiling will reduce the reflections. On the other hand, if too much absorption is used, the sound will have an undesirable dead quality. In addition, the acoustic power reaching the microphone is greatly reduced.

Liveness of the sound is to be desired, provided the reflections do not cause too much echo or reverberation, resulting in reduced definition. A recent development in studio treatment is to construct the wall surfaces in the shape of convex half-cylinders. These surfaces reflect the sound, giving it a live quality, but scatter and break it up so that the effect of echo is not present.

Power Amplifiers

A single power amplifier is capable of driving a number of loudspeakers,

THE SOUND OPPORTUNITY

... is limited but profitable

Sound equipment sales are today a priority business, sold on a priority of AA-5 or better. Because of the proven advantages of sound in production the WPB recently eased priority restrictions. The plant does not even have to be a war plant—essential civilian production qualifies it for an installation. To get the necessary priority it is necessary for the customer to file form WPB-617 with the local WPB.

Every concern employing 100 or more employees is a prospect. Even a small percentage of the potential business in a given territory gives the qualified dealer and jobber insurance for the future as well as a four-way profit:

1. On equipment sales
2. On installation fees
3. On future extensions and expansion
4. On flat fee maintenance

The reader is referred to the article on page 21 of this issue, "WPB Service Guide"—for the latest facts on dealing with the various sections of the War Production Board. (As interpreted by John Meck Industries).

depending on their size and power requirements. An additional determining factor in amplifier specification is the number and location of the speakers which will always be carrying the same program.

Five per cent is the maximum allowable non-linear distortion, lower values preferred. Distortion factor may be reduced by operating an amplifier at less than rated load.

Power amplifiers should have flat frequency response within the given range. An allowable exception is where a frequency distortion is deliberately introduced to overcome local acoustic conditions. (See later discussion on Networks.)

Areas of differing noise levels sometimes require separate power amplifiers so that volume levels can be independently adjusted. They may be placed in a single location for convenience. This practice simplifies operation and maintenance. However, it is often advantageous to mount each one near the loudspeakers it is operating. This allows more convenient adjustment to varying noise conditions. Also, in transmitting the signal over long lengths of wire unavoidable losses occur. These losses are lower for the small power carried to the amplifier than for the larger power delivered to the speakers. Remote power amplifiers can be turned on and off from the control point by means of relay circuits.

Voltage Amplifiers

Voltage amplifiers are generally required to drive the power amplifiers. Their number, size and locations depend mainly on the uses of the system, the place, the nature of input sources. In the majority of cases they are placed together, near the controls.

Most of the above discussion on power amplifiers applies to voltage amplifiers as well. Special circuits and networks, however, are often incorporated in the voltage amplifier to control its frequency characteristics.

Wiring

Shielded wire is used on all low-level circuits; that is, where the circuit is still subject to amplification. The

| DESIGNATION | SOURCE OF SOUND | ULTIMATE DESTINATION | FUNCTION AND COMMENTS |
|--------------------|--|---|---|
| 1. WORK MUSIC | Recordings Wired-In service Radio programs | One or more areas of plant. Selective control of destination may be desirable | To increase efficiency of personnel by planned music programs during work period |
| 2. ENTERTAINMENT | Recordings Wired-In service Radio programs Live talent, employee Groups or visiting celebrities | Ditto | To increase and maintain morale of employees. Not used during work periods |
| 3. MORALE BUILDING | Recordings Radio programs Talks by individuals | Ditto | *To build morale through inspirational messages, drives, safety campaigns, announcements of general interest, etc. To bring about more personal contact in personnel relationship |

*Distinction is made between Entertainment and Morale Building Uses, on the basis of material transmitted. Entertainment usually involves Music AND Speech. In this tabulation Morale Building is concerned with speech transmission only.

Above (and table on page 36): Wartime growth of industrial sound uses covers improvement in production operations thru better intercommunication, as well as straight morale building through special programs. Right: Figure 2 shows effect of frequency range on music intensity in plant broadcast systems. Shaded area shows envelope of noise background.

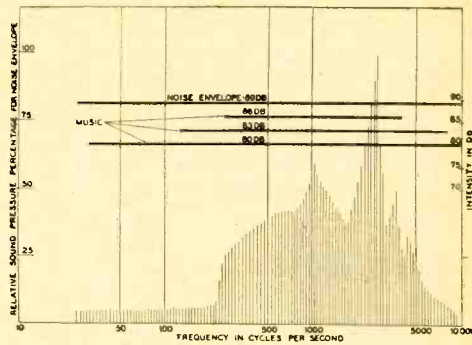


Figure 2.

shield is a metallic basket-weave sheath and is connected to the ground. It prevents the signal wire from picking up stray impulses which, when amplified would cause noise in the loudspeaker. The shields should be insulated along their length from contact with metal and must be grounded at *only one end*. Low signal level wires must be isolated from wires carrying output signals or ordinary power circuits.

Wiring to loudspeakers does not need shielding and, in general, can be the same type of wire used for ordinary electrical purposes. Voltages are low so that usually it does not have to be enclosed in metal conduits. Special consideration must be given to its size for two reasons: the current may be high, causing excessive heating, and the resistance of the wire causes loss of power. The larger the wire, the less its resistance.

A reasonable power loss to allow in the loudspeaker wiring is one-half decibel. Figure 3 is a convenient means of selecting the right size wire for this limitation. If the conditions indicate a point between two wire sizes, choose the larger, or one at the right. If the point falls to the right of the line for #14 wire, then the impedance of the speaker is too low for the length of run required. Such a case requires a higher impedance connection at the amplifier and a corresponding matching

transformer at the loudspeaker. A 250 or 500 ohm loudspeaker circuit is generally useful for industrial purposes.

Connections

It is well to use special connectors on all sound system wiring except that which connects to regular power outlets. More than one loudspeaker has been ruined because it was fitted with an ordinary domestic plug and someone thoughtlessly put a hundred and ten volts across it.

There are many types and sizes of special connectors made for radio and sound system use. It is a good plan to have different types for power supply, microphone inputs, phonograph input, and loudspeaker connections, so that there will be no possibility of the wrong units being joined together. It also simplifies the actual connecting. If the loudspeaker plug an an amplifier is distinctive from all other connections, you can tell at a glance where the wire goes.

All connectors should be of a locking type, particularly any which may be put in a loudspeaker line. This will prevent their accidental separation.

Permanent connections should be soldered and carefully insulated. Improper insulation of connections has caused trouble in many a sound system.

[To be continued]

TRAIN RADIO LAW

RMA has received information that a bill has been introduced in the Oklahoma Legislature to request Congress, the FCC and ICC to take steps looking toward the use of radio in the operation of trains in the interest of public safety.

In Trade
[from page 12]



J. F. Pedder

E. Gilbert

Frigidaire Reorganizes

Lee A. Clark, assistant general sales manager, Frigidaire Division, General Motors Corp., Dayton, O., announces appointment of James F. Pedder as advertising manager (formerly assistant AM); and Ellsworth Gilbert, sales promotion manager (formerly sales training manager); both effective immediately.

These appointments serve to consolidate the functions of four different departments, centering them now in the advertising department and the sales promotion department. With this type of organization, Mr. Clark points out, all "customer influence" functions for all Frigidaire products are the responsibility of Mr. Pedder's department. Likewise, all activities designed to inform, train and stimulate the selling organization are the responsibility of Mr. Gilbert's department.

WPB Surveys Appliance Needs

The fourth consumer survey, in which consumers will be interviewed on shortages in household and apparel items, was begun last month by enumerators from the Bureau of the Census of the Department of Commerce, the Office of Civilian Requirements of the War Production Board announced today.

The field interviewing will cover 4,500 families in 68 communities in 45 states and the District of Columbia.

Persons will be asked to provide the information that WPB needs in programming the essential civilian requirements considered necessary to the maintenance of the war supporting economy. Information received from previous surveys has been used to re-

[Continued on page 46]

WE'LL PROVE

this 4 lb. book IS WORTH ANOTHER MAN in your shop!

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Don't confuse A. A. Ghirardi's 3rd Edition **RADIO TROUBLESHOOTER'S HANDBOOK** with books on servicing theory! It simply isn't that kind. You don't study the **HANDBOOK!** You just look up the Make, Model, and Trouble Symptom of the Radio you want to repair — and go to work!

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trouble checks; circuit and parts analysis; parts repair, replacement, substitution; obscure troubles; aligning and neutralizing; interference reduction — and **HUNDREDS** of other subjects including How to Start and Operate a Successful Radio-Electronic Service Business. 706 illustrations; 720 self-testing review questions. Only \$5 complete (\$5.50 foreign).

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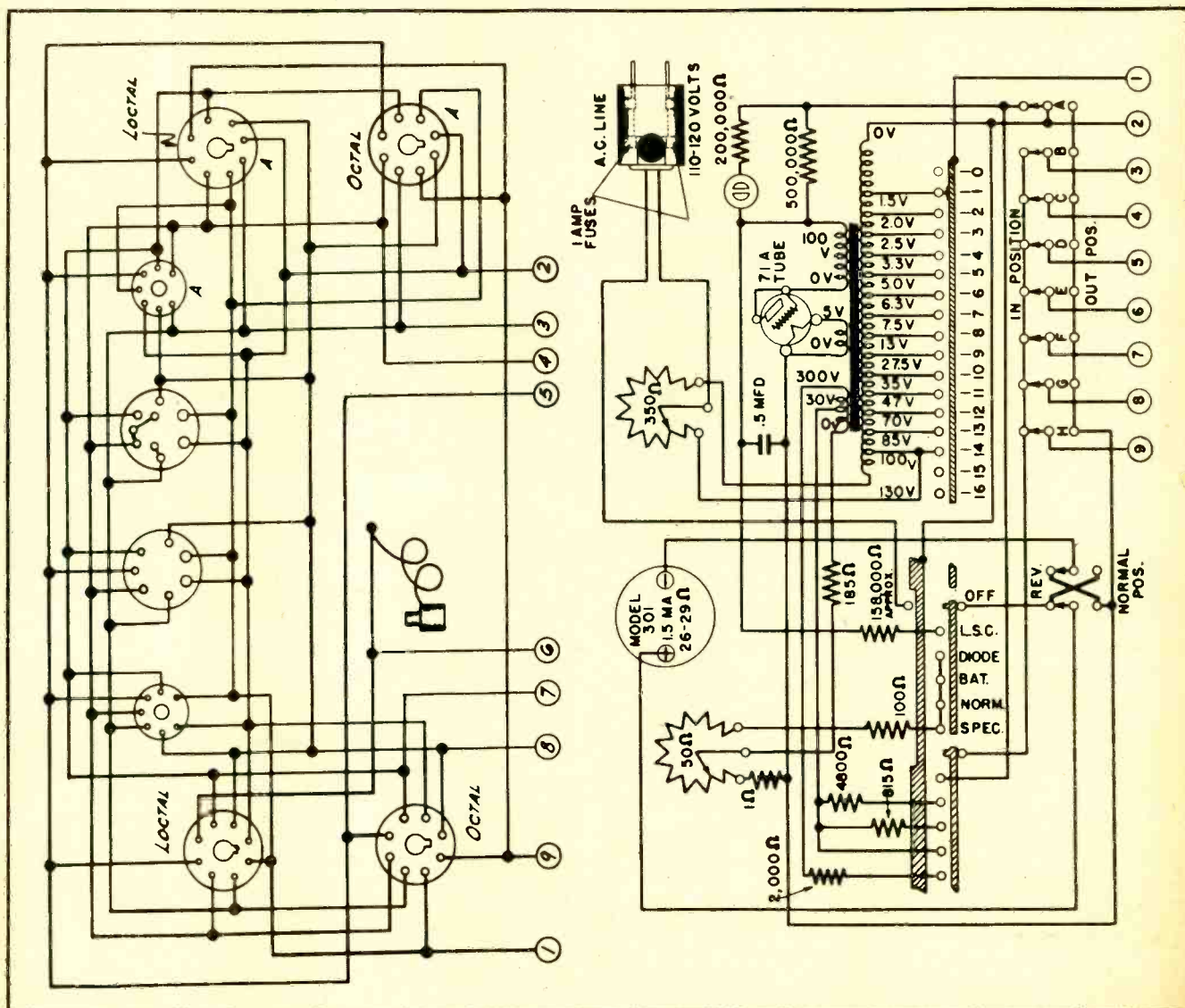
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Technical Service Portfolio

Section XLVIII

TEST EQUIPMENT CIRCUITS—Part 8

Through the cooperation of test equipment manufacturers we are publishing a series of hitherto unavailable schematics of their instruments. The circuit diagrams will be published without technical comment in a series of "Portfolios" of which this is a part. Subscribers desiring publication of circuits for specific instruments should write to Editor, Radio Service Dealer, for issue priority.



Weston Electrical Instru. Co. Tube & Battery Checker, (Model 777, Type 8 & 9)

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As a radio serviceman, no one has to tell you that a wire wound resistor is no better than its insulation — or that that is why Sprague Koolohm Resistors are "tops" by any test you care to name. Koolohm ceramic insulation is applied directly to the wire and the assembly is then DOUBLY protected by an outer ceramic tube. Koolohms operate so cool you can use them at full wattage ratings. They are highly resistant to both moisture and heat. They give you higher ratings in smaller sizes. KOOLOHMS will not let you down!

WANTED—RCA Electronic sweep test oscillator #150 or 150A. J. M. Dalcourt Shipshaw Co., Chicoutimi, Quebec, Canada.

FOR SALE—4-tube homemade sig. tracer (will also measure AVC), professional construction; Supreme 571 sig. generator; and Metropolitan sig. tracer with detector tube in probe. New condition. Want Supreme 560-A redolizer, Hickok RFO-5 CB0, Supreme 546 CR0. Mike Blackwell, % Marine Hospital, Memphis 5, Tenn.

WILL TRADE—Triplet #1201A tube tester in A1 condition, complete with charts, for Superior #1230 sig. generator in good shape, or what have you? Wm. J. Willey, 54 Redan St. St. Thomas, Ontario, Canada.

URGENTLY NEEDED—Set of four prong plug-in coils (including broadcast and short wave bands). Dallas L. Barrett, Jr., Kentfield, Calif.

FOR SALE OR EXCHANGE—6" Atlas lathe with 30" bed, including various attachments. Write for details. Will swap for Rider chanalyt and #132 Stancor power pack. L. Browne, Sound Radio and Electronics, 210 Kings Highway, Brooklyn 23, N. Y.

WANTED—Rider manuals 1937 to 1942 inclusive. F. A. Merrick, 195 Cedar Street, Hempstead, N. Y.

WANTED—Supreme vedolyzer #506A. Urgently needed. Allied Radio-Television, 1234 Broad St., Providence, R. I.

FOR SALE—Western Electric broadcast high fidelity audio transformers in good condition, five of each type—247A, 247L, and 132A. \$5 each or \$60 for the lot. A1 E. Werhan, 103 Wesley St., Manlius, N. Y.

FOR SALE OR EXCHANGE—Two used magnetic pick-up heads (Webster and

RCA), two new magnetic cutting heads, 6-8 ohms; sig. tracer diagrams, many of test instruments, multiple range meter dials, volt, ohm milliamperes, any size. Urgently need clock with sweep second hand, heavy duty B. supply for 6 volts. J. L. Orysten, Pewaukee, Wisc.

WANTED—AC line voltmeters, any make. Wm. Lofstrom, 1302 West Hill Ave., Valdosta, Georgia.

FOR SALE—Brand new RCA phonograph modernization kit, #11080, containing 7 ohm pickup, inertia type pickup arm, 20,000 ohm volume control and input transformer. Earl A. Lumis, 1105 Haddon Ave., Collingswood, N. J.

WANTED—Thoradson input Xformer 15D85; also chokes 15C55 or 15C56, or equivalent. Have many parts to trade. E. Bavaud Toumin-Rothie, Broad and Hopkins St., Sewickly, Pa.

FOR SALE OR TRADE—7C7, 39, 36, 27, 24, 26, 0Z4, 45, 42, and many other tube types. Want two each of 117P7, 117L7, 117Z6, 50L6, 1A7, and 12SA7—also Rider Manuals 8 to 13. V. J. Balcar, 506 West 44th St., Austin 22, Texas.

WILL TRADE radio tubes, new in original cartons, 12SF5, 12J5, 1C5, 89, 30, 31, 34, 33, 25Z6, 12F5, 12SC7, 6P5, 6N7, for Triplet 1230 C free-point tester complete. Smith Radio Service, 132 So. 7th St., Steubenville, Ohio.

WANTED—Two RCA MI-4856 transcription heads or any similar high quality head with arm, also all types test eqpt. C. A. Perkins, P. O. Box 1847, Jackson 114, Miss.

WANTED—Channel analyzer, sig. generator and tube tester. Brokaw, RT #4, Bx. 544, Stockton, Calif.

FOR SALE—Radio-electronic course, incl. radio, television, f-m and industrial

electronics, \$45 cash. Want to buy battery charger. E. L. Woody, 615 Oglethorpe Ave., Albany, Ga.

WANTED—Tube checker, service manuals, tubes and meters. Bernard Kahn, 1050 Carroll Pl., Bronx 56, New York, N. Y.

FOR SALE—Hickok AC51 tube tester, completely modernized; RCA chanalyt; Szkyridermarine; Clough-Brangle VTVM #88 G-E 200 Ua meter. Want to buy tube checkers for modernizing, Hickok preferred, also other test eqpt. & meters in any condition. Scott Electronic Lab., 4859—68th St., San Diego, Calif.

WANTED—Rider's manuals 7-8-9, also 12SK7, 12SQ7, 35L6G, 35L6gt/g, 35Z5G, 35Z5gt, 12SA7, 6C6, 117Z4gt tubes, etc. Home Radio Service, 643 N. Ave. 64, Los Angeles 42, Calif.

WANTED—Television set in operating condition or in need of repairs, any size, 5", 9", 12", chassis only or in cabinet. Will consider without cathode ray tube. W. S. Smith, 620 N. Maple Ave., Hoiokus, N. J.

FOR SALE OR SWAP—New pair of 813 and 100th transmitting tubes. D. Camreta, 484 Clifton Ave., Newark 4, N. J.

FOR SALE—Back nos. of radio and mechanical magazines, Radio Craft, Radio News, S-W Craft, Popular Mechanics, Popular Science, etc. Aubrey Edgerton, 116 W. 6th Ave., Houston 7, Texas.

WANTED—for cash, table model radio, any std. make in good condition. G. S. Hobbs, P. O. Box 697, Suffolk, Va.

URGENTLY NEEDED—#301 Weston d-c 0-1 millamp. meter or square 4" 0-1 d-c ditto. Harry L. Derfingler, Jr., 1210 West 5th St., Sioux Falls, S. Dak.

FOR SALE—One National Radio Institute chassis, \$3.50, one a.f. coil, \$1.50. Billy Haney, Box 54, Deaver, Wyo.

FOR SALE OR TRADE—Jensen AC-DC; Peerless AC-DC; Utah AC-DC speakers with rectifiers in perfect condition. Also #199 analyzer, meters and resistors in perfect condition, in velvet lined case. Want dual speed phono motor with light crystal pick-up or what have you? Radio Exchange, 1711 Pearl St., Boulder, Colo.

WANTED—RCA V-140; also one 12A8 tube; 500 H. Y. plate choke, and 350 mfd. variable condensers. Mrs. J. S. Stell, 704 So. Roper Ave., Gainesville, Fla.

FOR SALE OR TRADE—Have new 16 mm Cine Kodak 'E' camera with 24x elec. motor drive. Want good Hallcraft receiver or 8 mm projector. Ros Hawks, CM3, 60th Seabees, Camp Parks, Pleasanton, Calif.

FOR SALE—Radio parts, condensers, transformers, tubes, meters, transmitter parts, etc. Write for list. Want Weston 301 0-1 ma.; Weston 301 0-200 microamp; Weston 476 0-10 or 0-20 amp.; relays, etc. Leo F. Kersey, White Sulphur Springs, Va.

FOR SALE OR EXCHANGE—Two 15 ohm cutting heads for cutting broadcasting transcription lacquer records, \$65 ea. or will exchange for a signal tracer and a condenser analyzer. Ralph W. Nicholls, 9985 E. Dixie Highway, Miami Shores 38, Fla.

WANTED—Circuit of Earl Webber Co's. #200 imperial tube tester or advice as to where this may be obtained. R. D. Rogers, 3115 Van Buren St., Wilmington 276, Dela.

WANTED—Weston #772 analyzer, with or without meter, but all other essential parts intact. Also want sensitive galvanometer and an a-c ma. Dan Jones, 922 So. Washington St., Alexandria, Va.

WANTED—Three of each following tubes: 1LE3; 50L6 35Z5gt; 25Z5; 1LN5; 1LH4; 1LD5; 1LA6; 117Z6gt/g; 35Z3, 6C6; K55B. Cpt. Geo. H. Bassett, 421 A.A.F. Base Unit, Signal Section Sqd. B; Muroc Army Field, Muroc, Calif.

WANTED to buy or borrow operating instructions for #199 Jewell radio set analyzer. John Farkas, 11426-94 St., Edmonton, Alta., Canada.

WANTED—Test eqpt. of all kinds at once—especially tube testers, ohmmeter, and milliammeter, also multimeter. Cash. Leo. E. Gervais, 35 Mills St., Greenfield, Miss.

WANTED—Just released from armed services and want to return to radio business. Will pay cash for all kinds of radio parts & tubes. Pete Kinlaw, 217 Lucas St., Fayetteville, N. C.

WANTED—Signal generator, tube tester with charts, also new or used tubes. Tulsa Training School, 2532 E. 11th St., Tulsa, Okla.

FOR SALE—Clough-Brengle CRA 3" scope; ditto 88A VTVM peak R. M. S. and D. C. reading, both instruments factory reconditioned. Unused G-E UM-3 unimeter, half movement, 2500v AC-DC 10 megs., steel carrying case. Prefer to sell all. West End Radio Lab., 72 West End Ave., Brooklyn 29, N. Y.

WANTED—25L6; 25Z5; 12SA7 and all hard-to-get tubes. J. W. Streater, 68 W. Marshall Rd., Lansdowne, Pa.

WANTED—Triplet 1600E, 1620, 1621, 1632, 1672 or equal. R. G. Burygraf, P. O. Bo 72, Cadiz, Ohio.

WANTED—Kenyon transformers K-2A3PT and KPLG. L. A. Mollman, 756 Edwin Ave., Glendale 22, Mo.

FOR SALE—Tested used tubes: 1-71A, 280, 316B, 210, 247, 6G5, 450, 3-26, 3-45,—\$5. Geo. Hassinger, Frankfort, S. Dak.

WANTED—Vols. 12 and 13, Rider's manuals. Kenneth Law, 203 E. 2nd St., Fairmount, Ind.

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This is Sprague's special wartime advertising service to help radio men get needed parts and equipment, or dispose of radio materials they do not need. Send your ad today. Write PLAINLY or PRINT — hold it to 40 words or less. Due to the large number received, ads may be delayed a month or two, but will be published as rapidly as possible. Sprague reserves the right to reject ads which do not fit in with the spirit of this service.

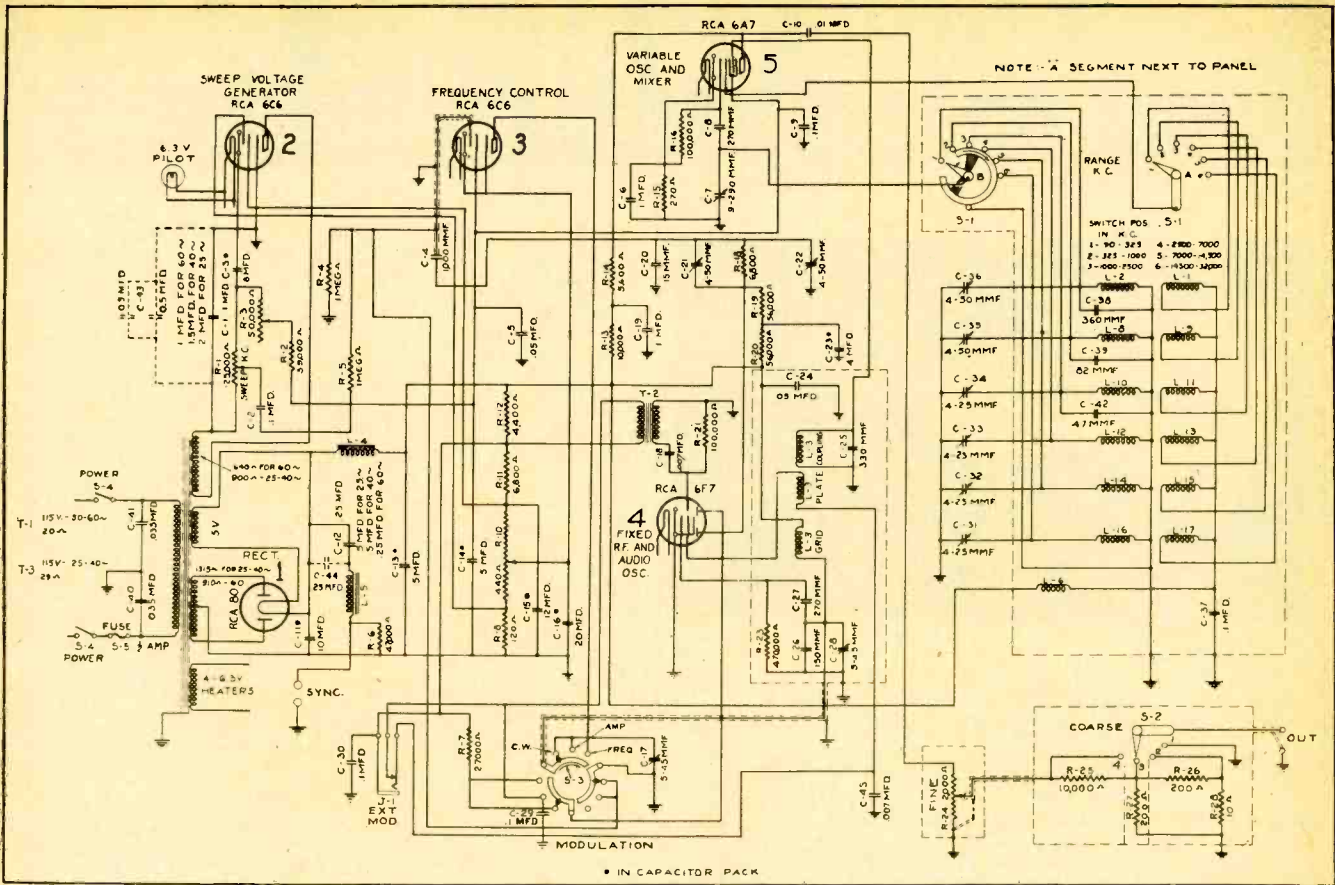
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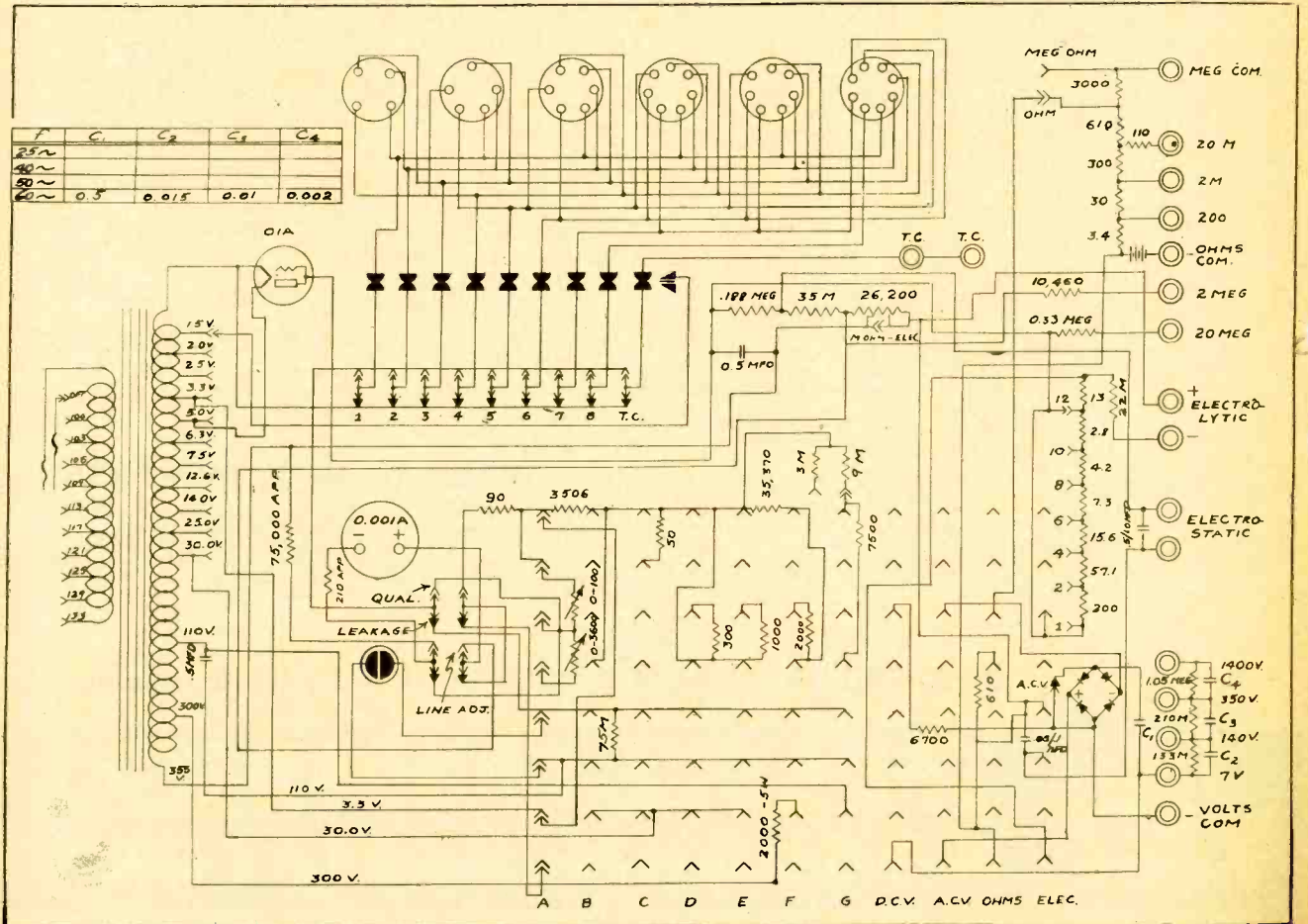
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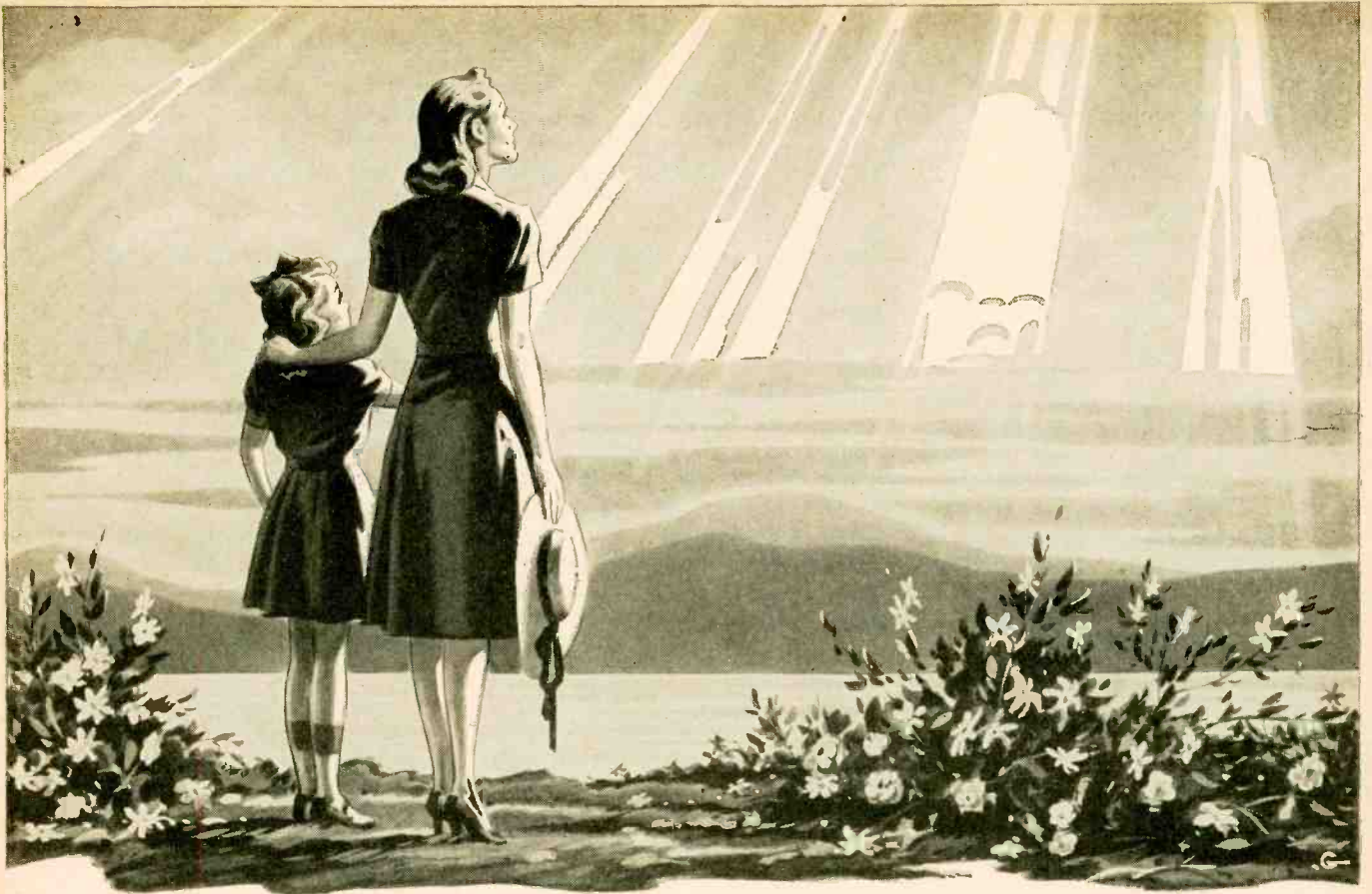
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Radio Corp. of America C-R Oscilloscope (Model 150-1)



Supreme Instrument Corp. Tube Tester (Model 502)



IT'S SPRING...

and the Plants are Booming!

NO, THAT'S NOT A TYPOGRAPHICAL ERROR. We're not speaking of the agricultural variety of plants. We mean WAR plants—like this one at Eastern—and we mean *booming!*

When the Japs dive-bombed us into war, all America prayed for a quick ending. Yet here is still another Spring—a fourth peace-shattered Spring—and the enemy is still fighting back.

It's a tough war and we at Eastern Amplifier know it! Eastern is all-out for Victory, doing its utmost to help end the conflict before another Spring comes. Eastern-built equipment is helping America's war machines to navigate with

certainty—to bomb with accuracy. But we're not stopping there! Eastern engineers are available for consultation on any electronic problem. They are serving *NOW!*

With the advent of peace, we shall turn our skill to the creation of better electronic products for a better America. Meanwhile, on request, let us send you the next of a series of articles on important phases of electronics, prepared by our engineering staff. Ask for Brochure 4-C.

Manufacturer's Representatives — write today for our post-war distribution plan. Please outline your present operations.

Buy **MORE War Bonds**



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WPB Guide

[from page 21]

assembly of new connecting or extension cords; the addition of wiring in homes or buildings that is not strictly maintenance or repair; and the conversion of a vase or other object into a lamp.

Due to the needs of our armed services, some repair parts and some kinds of materials are bound to be scarce and hard to obtain. In such cases, two possible remedies are suggested. First, repair shops should keep in close touch with their principal sources of supply. Second, they may find it advantageous to do some shopping around among various supply sources.

Controlled Materials

CMP Regulation 9A tells how repairmen can get limited amounts of controlled materials (copper, steel and aluminum in controlled materials form, including copper wire and cable and copper tubing) for civilian maintenance and repair jobs, and also the rating they can use to get other

materials and parts. This regulation also tells how certain repair shops which do industrial work, including motor rewinding, may get permission to the allotment symbol S-1 to purchase larger quantities of controlled materials.

A way that shops servicing industrial and commercial refrigerating and air conditioning systems can obtain controlled materials by using a special MRO allotment symbol and certification is specified in *Order P-126*.

Repairmen working with metals should read WPB Orders *M-9-c*, *M-9-c-4*, and *M-126*, which contain certain restriction on the uses of copper and steel respectively. In order to find the conditions under which copper or copper base alloy pipe, tubing or fittings may be installed for cooking, heating or plumbin purposes, consult *Order M-9-c-4*. Schedule VI of L-126 also contains restrictions on the use of copper or copper base alloy pipe or tubing in service connections for industrial and commercial air conditioning or refrigeration systems.

Motors

Interpretation 1 of CMP Regula-

tion 9A emphasizes that the rating given to repairman by it cannot be used to get any "complete item ordinarily used by itself". However, new fractional horsepower motors, to be used for maintenance and repair replacement purposes in mechanical refrigerators, washers, pumps and other machines, are considered repair items and may be ordered from suppliers or motor dealers with CMP Regulation 9A ratings. Such rated orders must be honored in accordance with the rules prescribed in *Priorities Regulation No. 1*.

Rules for the purchase of new fractional horsepower motors to be used for replacement purposes in commercial refrigeration and air conditioning equipment will be found in *Order P-126*.

Tools and Special Equipment

CMP Regulation 9A provides for the purchase of materials and items needed by repair shops for their maintenance and repair work for others and, incidentally, for the maintenance and repair of their own shops. The capital equipment of shops, including special tools, is obtainable in other ways.

Shops servicing commercial and industrial refrigeration or air conditioning equipment should consult *Order P-126* about buying necessary service tools.

Employees of a person who has been assigned a rating of AA-2X or higher for maintenance, repair and operating supplies, who want to purchase hand tools, gages, tool boxes and certain safety items which the employer requires the employees to have for exclusive use in his business should refer to *Direction 4 to PR-3*.

Many kinds of hand service tools may be purchased by repair shops from wholesalers without a preference rating, because the restrictions of the current WPB Order E-6 apply only to purchases from manufacturers. Some wholesalers obtain ratings for such purchases by filling *WPB-547 (PD-IX)* applications, and they are expected to sell items obtained that way to their customers, subject to rated orders, without asking for ratings.

If a rating is needed to purchase tools or special equipment, and the repairman needs a higher or special rating for that purpose, a *WPB-541 (PD-1A)* application may be filed with the nearest WPB field office. However, certain kinds of radio equipment require the filing of an application on Form *WPB-3243*, and the nearest WPB field office should be consulted about this.

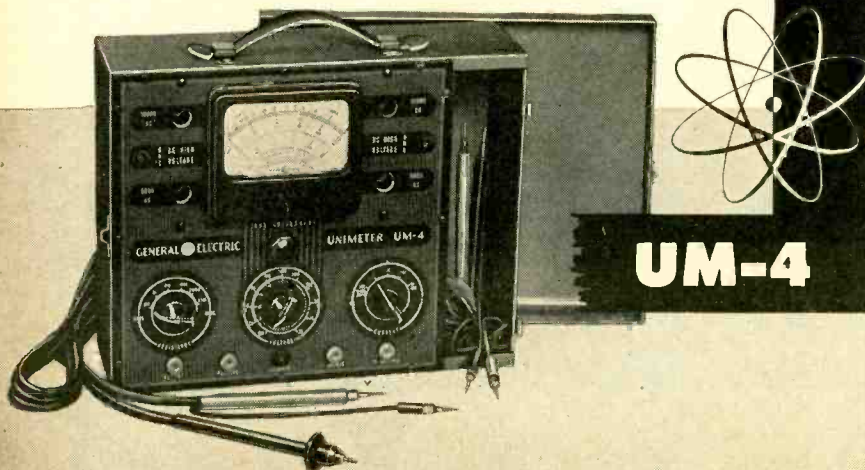
G-E UNIMETER . . .

THE UM-4 is an invaluable instrument for service work. Not only is it useful in common radio and industrial applications, but also for the higher voltages employed in cathode-ray tube work and the very high voltages encountered in television. Special jumbo prods are provided for protection on high voltage work. Two-tone scales permit quick and accurate readings. Write: *Electronics Department, General Electric, Schenectady 5, N. Y.*

Electronic Measuring Instruments

GENERAL  ELECTRIC

177-03



UM-4



ANOTHER
Jensen
SPEAKER WITH
ALNICO 5

• The reproducer unit in this loud speaker was especially developed by JENSEN for use in the intercom systems in navy vessels. It reproduces speech clearly and sharply through high levels of noise. Ruggedly built, it withstands extreme shock and vibration, and is weatherproof against severe weather exposure conditions, dust and smoke . . . Like all JENSEN military models, this speaker is built around the most powerful permanent magnet mate-

rial ever developed, *ALNICO 5*, as all JENSEN PM Speakers will be when conditions permit.
Now being introduced for the intercom systems on trains, and specifically designed for that purpose, this particular model has many possibilities for use wherever a heavy, rugged speaker with clear, sharp speech reproduction is needed. Write for complete engineering data on this speaker. Samples can be furnished on proper priority.



Jensen
SPEAKERS WITH **ALNICO 5**

Specialists in Design and Manufacture of Acoustic Equipment

JENSEN RADIO MANUFACTURING COMPANY, 4601 SOUTH LARAMIE AVENUE, CHICAGO 38, ILLINOIS

In Trade

[from page 39]

duce the programing of some items and to increase the programing of others, WPB Bsaid.

This fourth survey, with some omissions, will be pretty much a combination of the second survey conducted in March 1944 and the third survey conducted in April 1944. However, the number of questions a person will be asked has been reduced, and the questioning itself will take less time than was formerly necessary. Some of the principal questions that will be asked are:

"What shortages have been bothering you lately?"

"Have you tried to buy a particular item since the first of the year?"

In the case of appliances, a person will be asked if he or she tried to buy that item last year. Then, for each item he has tried to buy, he will be asked whether he was successful or not, and if not how much difference it made. If successful in purchasing a particular item, the person will be asked how many he bought. It is hoped that tabulations can be completed to allow an announcement of preliminary results by the middle of May.



Left to right: W. Myron Owen, new president; Sam Siegel, retiring vice-president; Mrs. E. Cohen; S. I. Cole, retiring president; Stanley Green, new vice-president and chief engineer. At Aerovox testimonial dinner.

Aerovox Officials Retire

In an atmosphere saturated with reminiscences of almost a quarter century of closest teamwork, S. I. Cole, retiring president, and Samuel Siegel, retiring vice-president, were feted by their Aerovox associates at a banquet held in the New Bedford (Mass.) Hotel.

W. Myron Owen, the new president of Aerovox, concluded the evening's program with a brief address in which he gave tribute to the previous management, praised the splendid team-

work which has played so large a part in the growth of the organization, and pledged the unrelenting efforts of the new management to the maintenance of quality of product and of continuing growth.

Stancor Appoints

Grant Shaffer has been appointed representative for the jobber and industrial divisions of Standard Transformer Corporation in the Detroit area, with offices at 6432 Cass Avenue.

[Continued on page 48]



Fine instruments
produced in volume



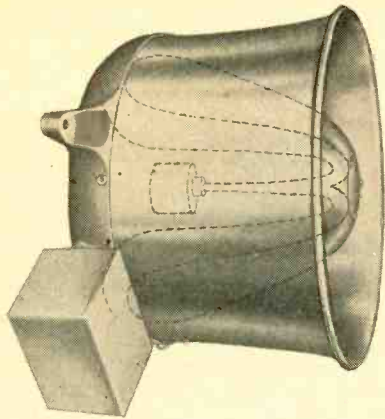
with Quality first
to last.

Triplett



ELECTRICAL INSTRUMENT CO.
BLUFFTON, OHIO

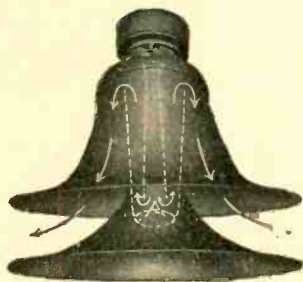
RADIO SERVICE DEALER



Left—MARINE SPEAKER; approved by the U. S. Coast Guard, for all emergency loudspeaker systems on ships. Re-entrant type horn. Models up to 100 watts. May be used as both speaker and microphone.



Right—RE-ENTRANT TRUMPET; available in 2½-3½-4½-6 ft. sizes. Compact. Delivers highly concentrated sound with great efficiency over long distances.



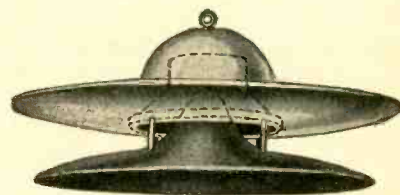
Left—RADIAL HORN SPEAKER; a 3½' re-entrant type horn. Projects sound over 360° area. Storm-proof. Made of RACON Acoustic Material to prevent resonant effects.



Right—AEROPLANE HORNS; super-powerful and efficient P. A. horns for extreme range projection. 9-4 and 2 unit Trumpets available.



Left—PAGING HORN; extremely efficient 2' trumpet speaker for use where highly concentrated sound is required to override high noise levels. Uses P.M. unit.



Right—RADIAL CONE SPEAKER; projects sound over 360° area. Cone speaker driven. Will blend with ceiling architecture. RACON Acoustic Material prevents resonant effects.

SEND FOR CATALOG



RACON

RACON ELECTRIC CO. 52 EAST 19th ST. NEW YORK, N. Y.

In Trade

[from page 46]

Mr. Shaffer, who was associated with Stancor for several years in an engineering capacity, brings a notable background of technical experience in fabrication and application of transformers to the trade.

School P-A Promotion

A meeting of the RMA special committee to promote equipment of public schools with sound systems was held at the Roosevelt Hotel, New York City. L. A. King of St. Charles, Ill., is the committee chairman. The radio

equipment school project is being conducted in cooperation with a similar committee of the U. S. Office of Education. Specifications for central sound systems in schools and other educational institutions are being developed.

the most successful talked-of sales plan in the industry had proved itself successful beyond question prior to the war and will be continued without fundamental change. As a result of the extensive advertising that has been



Sparton Sales Meeting

High spot of recent Sparton national sales meeting at Jackson, Michigan, was a demonstration of striking new radio models with F.M. Although Jackson is approximately 30 miles beyond the effective radius of the station used the reception was perfect. A number of new cabinets styled by the internationally famous designer John Tjaarda were shown.

Ed Bonia, general sales manager, radio and appliance division, addressing the meeting, said in part:

"No man knows when the starting gun for the postwar radio sales race will be fired; but whenever it is Sparton will be ready. The S. C. M. P. —

done on this plan in connection with the high cost of distribution, we have received at the factory thousands of interested inquiries from well rated dealers in all parts of the U. S. A."

Harry Sparks, president, informed the meeting in detail of the strong financial and manufacturing position of his company. A greatly expanded advertising and sales promotional program for the fiscal year starting July 1st was outlined by Fred Sterritt, advertising & sales promotion manager.

Standardizes Controls

International Resistance Company of Philadelphia has made a thorough study of the many and varied controls it formerly manufactured and has standardized on an even hundred numbers which the Company claims will handle better than 90% of all service needs. These it presents to the trade as the Century line.

Only after careful investigation of sales records and exhaustive review of set designs were these models chosen as basic by both the sales and engineering departments. This new IRC policy of streamlining its extensive line of controls cannot help but reflect to the advantage of jobbers and servicemen alike.

The Company claims further that with such a compact line, for greater
[Continued on page 50]

DEALERS ATTENTION! Make More Money By Taking Advantage Of Our Radio Repair Service

- Work done by Experts and guaranteed.
- Fast service. In most cases radios will be repaired and on their way back to you within 48 hours after arrival.
- Low prices, allowing more profit for you.
- All makes, car and home radios repaired. Ship via Express or Parcel Post

Send That Set Today . . . To
FINEST RADIO SERVICE
307 Pipestone
Benton Harbor, Michigan

SPEED UP REPAIRS WITH THESE G-C AIDS!



FREE
STEEL
CABINET

G-C Dial Belt Kits

Exact replacement woven fabric belts. Easy to install — no stretching — no adjustments — a perfect fit every time. Kits come with 25, 50, 100, 200 or 300 belts.



Automatic Wire Stripper

Strips insulation from all types of wire. Does the job instantly, easily, perfectly. An ideal tool for radio men, electricians and sound men.



G-C Ne-O-Lite

New improved design. Useful hundreds of ways. Tests AC and DC lines, DC polarity, fuses, etc. You can't afford to be without this handy all-purpose trouble shooter.

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

GENERAL CEMENT MFG. CO.
ROCKFORD, ILLINOIS



• Ted McElroy

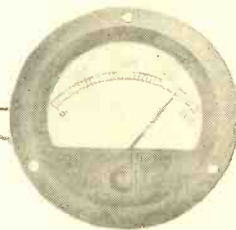
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MARION Multi-Range

METERTESTER

With self-contained power supply and control equipment for operation on 110 volts, AC, 60 cycles . . . for production testing, and calibration of DC instruments



No additional accessories are required. Merely connect the two clips to the instrument under test, and proceed to analyze its accuracy and general performance.

INCLUDES...

- Regulated Power Supply
- Stepless Vacuum Tube Voltage Control
- Large 8½" Mirror Scale Standard Instrument, Hand Calibrated
- Decade of .1% Accurate Manganin Wire Wound Resistors

After having been successfully used for four years in our own plant, the **Marion MeterTester** is now ready for marketing. It is designed with many operational features which will definitely improve the production rates of any meter inspection department. Moreover, its accuracy is such that it may be used for checking purposes in any department and all laboratories employing instruments. It may also be used as a source of DC current and voltage.

The **MeterTester** is provided with a simple, but effective, Vacuum Tube Voltage Control using a type 6N7 as a grid controlled variable resistor for complete and smooth control of the power to the standard from 0-110 volts, DC. This obviates the use of cumbersome rheostats which oftentimes are unsatisfactory for the wide range of current and voltage covered by the **MeterTester**.

Range of this unit is 25 microamperes full scale to 10 milliamperes full scale, with the first scale division reading ¼ microampere, and 0-100 volts full scale. Overall accuracy is better than ½ of 1%. Basic sensitivity of the Mirror Scale Standard Instrument is 10 milliamperes. The complete unit is housed in a hand-rubbed, solid oak carrying case.

Additional Details Supplied Upon Request

Marion also manufactures a complete line of Electrical Indicating Instruments

Ideal Counter Display for Meter Jobbers


MARION ELECTRICAL INSTRUMENT CO.
 MANCHESTER, NEW HAMPSHIRE
 Distributed by **ELECTRICAL INSTRUMENT DISTRIBUTING CO.**
 458 BROADWAY • NEW YORK, N. Y.



● A handful of these Aerovox paper tubulars of assorted capacitance values, 600-volt rating, can take care of most usual paper capacitor replacements. It pays to have a small stock on hand for rush jobs. Use them singly or in combinations. And you can count on them to "stay put".

● Ask Our Jobber . . .

Ask him to make up an assortment of general-purpose values for you, to take care of your rush jobs. Ask for latest catalog. Or write us.

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THIS IS THE ANSWER TO YOUR RADIO REPAIR TROUBLES!

Just SEND us the SET via Railway Express. We REPAIR and RETURN. You ADD MARK-UP AND DELIVER. That's all there is to it.

- Complete Stocks—We can fix 'em all
- 90 day guarantee
- Prompt service
- OUR LOW PRICES mean more Markup for you.

Send that set to
SHEFFIELD RADIO CO.
914 Belmont Ave. Chicago 14, Ill.

In Trade

[from page 48]

than ever universal use, the inventory of both the jobber and serviceman can be smaller, with an end result of faster turnover . . . increased profits.

Dealers Attend Telecasts

Richard A. Graver, vice president in charge of the radio division, announces that Admiral Corporation and television station WBKB have concluded a broad joint working arrangement to further television development.

As the initial phase in the arrangement, Admiral, starting in April, will take over two 30-minute evening periods a week for a variety of experimental telecasts. These programs, although commercial in format, will serve chiefly, according to Graver, as an "educational course" for Admiral dealers and distributors to ground them thoroughly in television fundamentals. Dealers will attend telecasts in a group as part of the plan. The programs will be under the direction of Seymour Mintz, advertising manager of Admiral; Pat Shannon, Admiral account executive for the Crutenden and Eger, advertising agency, Chicago, and Helen Carson, program director of the station.

A survey of all sets in the WBKB listening area to fix their ownership, location, operating condition and audience size, is now being made by the station. Weekly "enjoyment questionnaires" to be sent owners will probably become a part of the plan.

The move, Graver explained, is in line with Admiral's television attitude of "preparedness for any eventuality, whether sudden or remote." It follows the industry furore created in November of 1944 when Admiral unveiled its "Commander-in-Chief" set at a national distributors' post-war planning meeting. This set embodies television, FM, AM, Slide-A-Way radio phonograph, automatic record changer, record storage, home recording and other features in one cabinet.

The arrangement will make Admiral first among electronics and appliance manufacturers in the Chicago area to take to the television lanes. Experimental merchandising on the entire Admiral line — radios, radio phonographs, Dual-Temp electric refrigerator, Admiral home freezer and Admiral electric range will be done on the programs, Graver declared. WBKB is the only television station in Chicago now operating on a regular schedule.



★ Clarostat standard tapped controls, Series TCP, permit replacement of tapped units with the assurance that the total resistance value and tap satisfactorily match the original.

Twelve selected values, in resistance ranges from 250,000 ohms to 2 megohms. One or two taps. These standard units are listed in the Clarostat Interim Line (essential wartime servicing items). These controls are equipped with the original Ad-A-Switch feature. List price \$1.50.

★ See Our Jobber!

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RADIO TUBES FOR SALE IN5

(114 with adapter to replace 1N5, complete unit \$1.25 ea.
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| | |
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| 65H7 | @ .59 ea. |
| 65N7 | .59 ea. |
| 7H7 | .50 ea. |

ALL TUBES IN FACTORY SEALED CARTONS, NATIONALLY KNOWN BRANDS.

7H7 is directly interchangeable for 7G7 (1232), 7L7, 7V7 and 7A7. 7H7 can be used for 6A7, 6A8 and 6K7 with an adapter. Adapters available at 50¢ each. Do not send money in advance; will ship C.O.D. All offers are subject to prior sale. Please send L-265 with order.

PAUL'S RADIO ACCESSORIES
4425 DREXEL BOULEVARD
CHICAGO 15, ILL.

SHOP NOTES

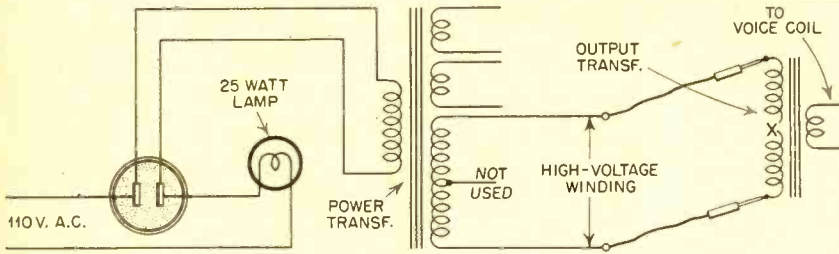


Figure 1.

WELDING WITH A POWER TRANSFORMER

A power transformer operated in series with a light bulb is an excellent device for welding the broken wire in a burned-out output or audio transformer. The light bulb, the wattage of which may be varied, limits the amount of current drawn by the power transformer, thereby protecting both power transformer and the one being repaired.

The center tap of the high voltage secondary is not used. Test leads are connected to the two plate leads. Contact to the transformer under repair is made

only momentarily until the break is welded. When the break is mended, it is advisable to insert a lamp of much lower wattage rating and let the device operate through the transformer for several minutes. (Figure 1).

To prevent damage to the electrolytic filter condensers by the alternating current, the transformer should be disconnected from the B+ lead during the repair.

Submitted by
Wade Gass, N. C.

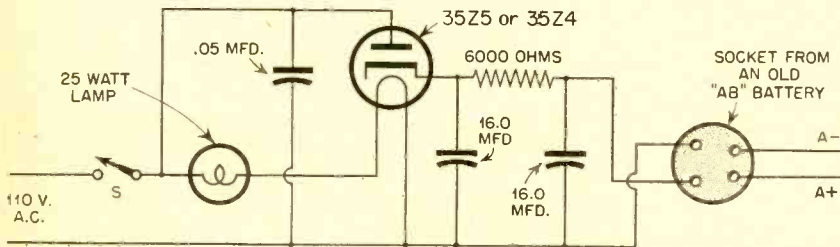


Figure 2.

'B' BATTERY ELIMINATOR

An efficient and hum-free B-battery eliminator can be constructed for use in the shop by using the components shown in the accompanying Figure 2. The light bulb can be dispensed with by using one of the 117-volt rectifier tubes.

If it is desired to use the power pack in the home in conjunction with a home receiver as a permanent installation the return a-c wire from the rectifier tube should be connected to the B-battery section of the switch in the set, after the wires already there have been loosened from the switch and soldered together.

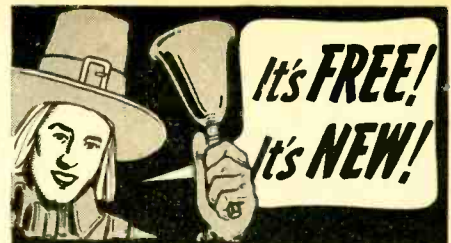
If the filter condenser in the set being tested with this power pack is defective, it will be evident as readily as with B-batteries, due to the voltage drop developed across the bias resistor in the set when the condenser is working properly. The components of this power pack can be installed in the radio or on a separate chassis.

A ground wire should not be used on the radio when using the power pack, unless a condenser is used in series.

Submitted by
Wade Gass, N. C.

\$1.00 PAID FOR SHOP NOTES

Write up any "kinks" or "tricks-of-the-trade" in radio servicing that you have discovered. We will pay \$1 in War Stamps for such previously unpublished "SHOP NOTES" found acceptable. Send your data to "Shop Notes Editor," RADIO SERVICE DEALER, 342 Madison Ave., New York 17, N. Y. Unused manuscripts cannot be returned unless accompanied by stamped and addressed return envelope.



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UNIVERSAL MIDGET TOOLS: DANDY SIX-TEEN PIECE SET: Midget Pliers, Diagonal Cutters, Four Midget End Wrenches, Needle nose Pliers, Screwdriver, S-x Punches & Chisel, Round File, Midget Crescent Wrench. \$14.85. IMMEDIATE DELIVERY overnight By Air to Everywhere! Remit Today. Catalogue Free With Order. If It's Tools, We Have It — Can Get It — or It Isn't Made! DEALERS TOOL SUPPLY, 1527 GRAND REA, KANSAS CITY, MISSOURI.

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Includes 100 ft. of pre-stretched Special Thin Cord, fibreglas core; just right for most small sets. 100 ft. of pre-stretched Standard Cord, fibreglas core; finest quality. 100 ft. of Medium Cord, recommended for larger table models and consoles. With this assortment you can replace Cord on practically any set made since 1934.

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73-B Mill St., Akron, Ohio

Please send me the Thrifty Cord Rack with 300 ft. of Cord in three sizes. I enclose \$4.87 plus 13¢ postage.

NAME

ADDRESS



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KEEP AN



ON

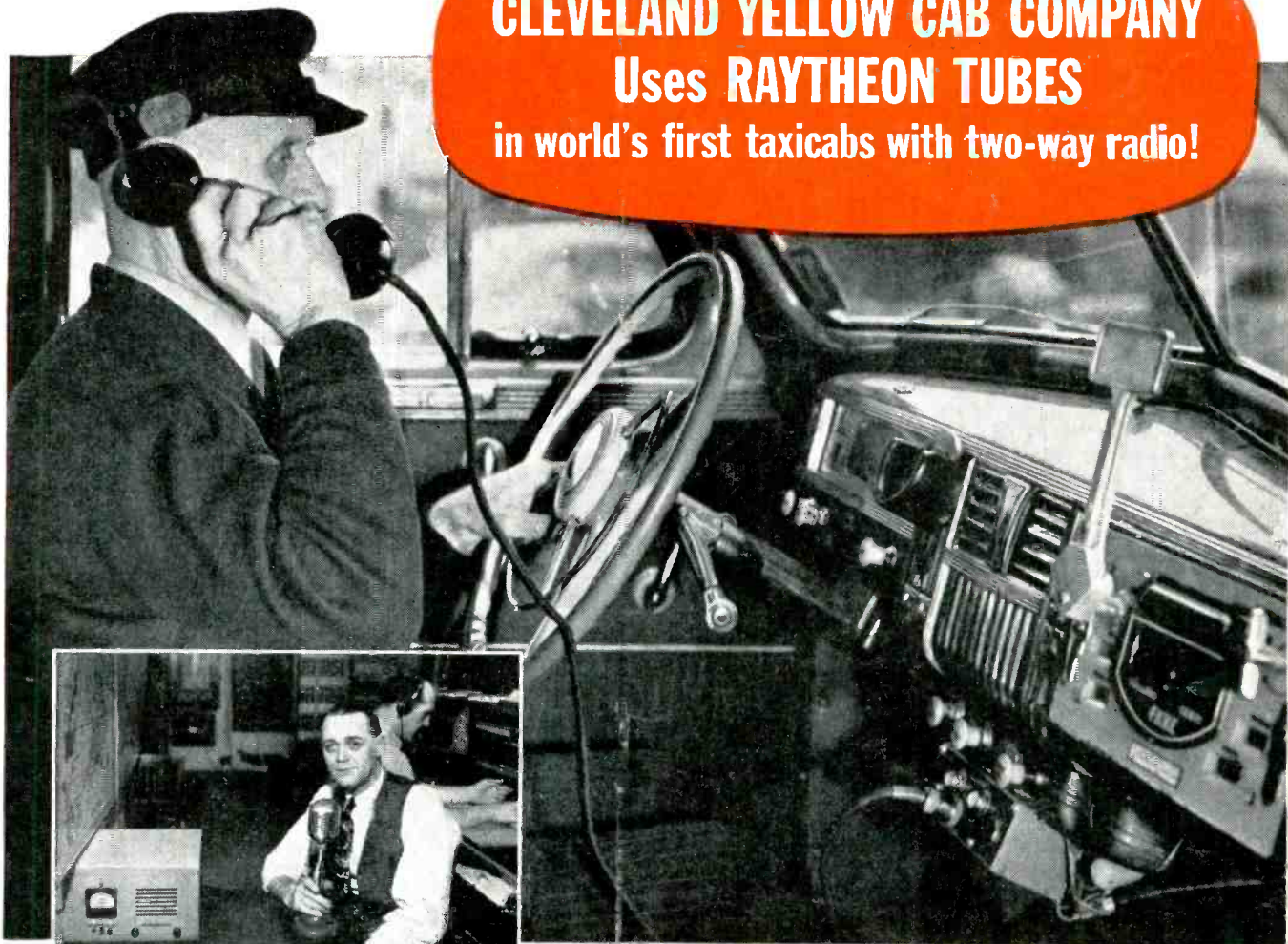
Detrola radio

division of
INTERNATIONAL DETROLA CORPORATION
Detroit 9, Michigan



More WACS needed
for hospital technicians

CLEVELAND YELLOW CAB COMPANY
Uses RAYTHEON TUBES
in world's first taxicabs with two-way radio!



The eyes of the nation's transportation industry are on Cleveland these days, for it is there that the world's first taxicabs equipped with two-way radio are being demonstrated by the Cleveland Yellow Cab Company.

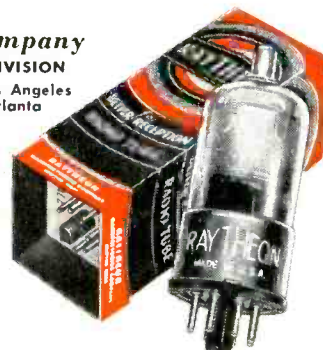
Officials say that dispatching has proved so much more efficient that future fleets similarly equipped will eliminate millions of miles of wasteful "dead" cruising. And they also report that Raytheon High-Fidelity Tubes, used in both transmitter and receivers, provide clear, dependable reception—even in the tunnels under Cleveland's Terminal Tower.

This application of Raytheon Tubes is just one of many being planned for the postwar period by progressive manufacturers in the electronics field.

If you are a radio service dealer, you, too, should realize that Raytheon's combined pre-war and wartime tube experience will result in even *better* tubes for all uses. Keep an eye on Raytheon . . . and watch for a Raytheon merchandising program that will help you be more successful, in the peacetime years ahead, than you've ever been before!

Increased turnover and profits . . . easier stock control . . . better tubes at lower inventory cost . . . these are benefits which you may enjoy as a result of the Raytheon standardized tube type program, which is part of our continued planning for the future.

Raytheon
Manufacturing Company
 RADIO RECEIVING TUBE DIVISION
 Newton, Massachusetts — Los Angeles
 New York — Chicago — Atlanta



RAYTHEON
High Fidelity
ELECTRONIC AND RADIO TUBES



All Four Divisions
 Have Been Awarded
 Army-Navy "E"
 With Stars

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