

radio service dealer

Dealers

Forecast

Selling

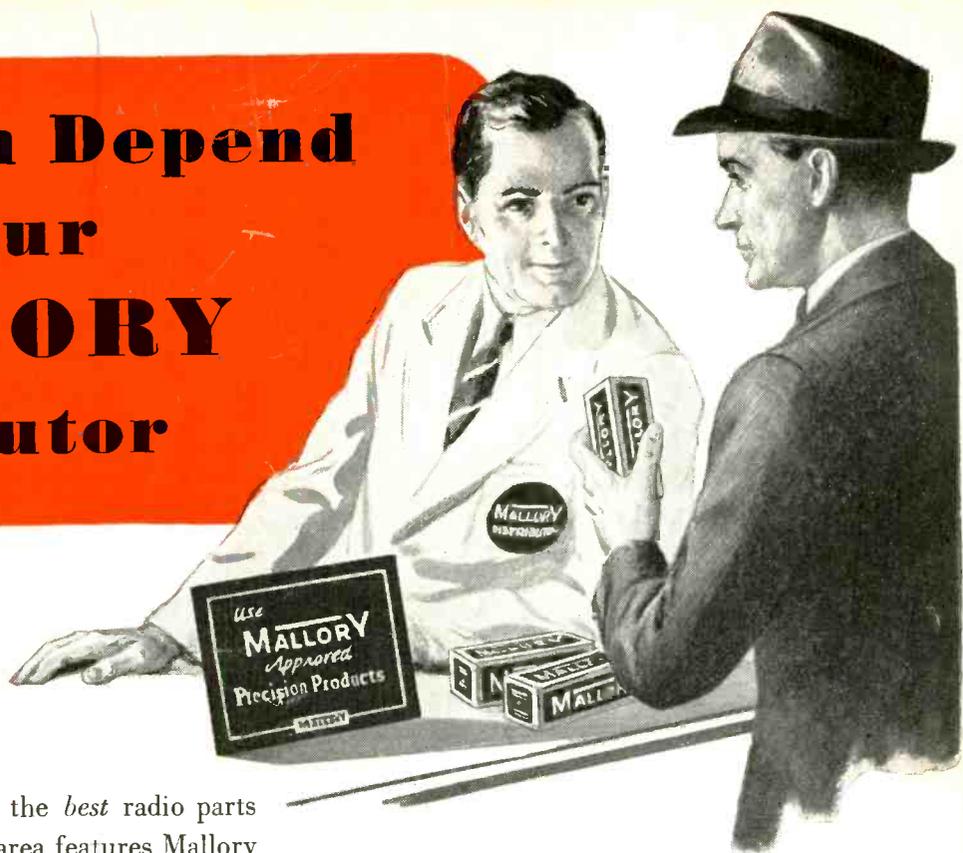
Preferences

**In
This
Issue:**

10 POINTS ABOUT GOOD WILL
Customer Appliance Demand Profit in Diversified Lines
Tube Substitution Charts

March, 1945
25c

You Can Depend On Your MALLORY Distributor



IT'S no accident that the *best* radio parts distributor in your area features Mallory precision products. He knows the quality of the merchandise and the integrity of the company that builds it . . . has demonstrated long familiarity with radio problems . . . has shown ability to deal with them. Moreover he knows how to give *real service*

—otherwise he would not have the Mallory franchise.

Your Mallory distributor is fitted by experience to save you time, worry and money. Go to him for your replacement parts. Call on him for advice and assistance *anytime*.

Here's What He'll Do For You:

1

Offer you a complete line of Mallory replacement parts . . . many of them first developed by Mallory research . . . ALL of them guaranteed against premature failure by years of service in the field.

2

Meet the maximum number of your application needs with the minimum number of parts. His program of Mallory Standardization will reduce your investment, simplify replacement, speed up delivery.

3

Give you detailed information on prices, parts, catalog numbers . . . work his head off to get you the items you need when you need them . . . give you prompt, efficient service *always*.

4

Provide you with bulletins, booklets, catalogs, letters, giving complete data on what to use and where to use it . . . offer you special publications and new developments and technical service fundamentals.

5

Offer his own personal experience in helping you solve unusual or difficult problems . . . help you train sales and service personnel . . . give you the extra help you need to meet emergencies.

6

Provide you, if asked, with sound methods of keeping your business on the beam . . . give you special promotion materials to help you sell your story to the public.

The Part Your Mallory Distributor Plays Is Important TODAY—to YOU!

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



*More than ever—
ALWAYS
INSIST ON*

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

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

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

*Trademarks

5 YEARS AHEAD OF ITS TIME

FM
AM
CW



27.8 to 143 Mc

Covers old and new FM bands

hallicrafters Model S-36

EXACTLY five years ago—in 1940—Hallicrafters introduced a very high frequency communications receiver with a range of 27.8 to 143 Mc. This model was clearly five years ahead of its time in its anticipation of new and exciting possibilities for superior performance on the higher frequencies. Today Model S-36 stands by itself as the only commercially built receiver covering this range. It is outstanding for sensitivity, stability, high fidelity. With its extraordinary VHF versatility it is ready for immediate application in the ever widening fields of FM and higher frequency development work. Engineering imagination at Hallicrafters is reaching out beyond the next five years, beyond the present known limits of radio technique so that Hallicrafters equipment will continue to be always ahead of its time, above and beyond your best expectations.



BUY A WAR BOND TODAY!

hallicrafters RADIO

THE HALLICRAFTERS COMPANY, MANUFACTURERS OF RADIO AND ELECTRONIC EQUIPMENT, CHICAGO 16, U. S. A.

Get this Display!

**Sell Customers
on Your Service—
Today and Tomorrow**

How about putting this beautiful salesgirl to work for you?

Let her sell your customers the idea . . . quality tubes mean quality service. Identify yourself with the progress and future implicit in the fact that RCA developed and introduced more tubes on the joint Army-Navy Preferred List of vacuum tubes than any other manufacturer . . .

Let people know you are actively in business and are there to stay! Get your Preferred Type Display from your RCA distributor . . . today.

Attractive full-color, 48" x 28" display easel (shown here in black and white)

**The Fountain-Head of Modern
Tube Development is RCA**



RADIO CORPORATION OF AMERICA

RCA VICTOR DIVISION • CAMDEN, N. J.

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

THE SPEED TESTER

SUPREME MODEL 592

★ 25,000 OHMS PER VOLT



★ PUSH BUTTON OPERATED

- ★ Design proven by over 5 years production
- ★ Dual D.C. Sensitivity—25,000 ohms per volt and 1000 ohms per volt
- ★ Matched resistors of 1% accuracy
- ★ Push button operated—no roaming test leads
- ★ Open face—wide scale 4 1/4" meter. 40 microamperes sensitivity
- ★ 1 Microampere first scale division

SPECIFICATIONS

- O.C. MICROAMPERES:
0-70-700 microamperes
- O.C. MILLIAMMETER:
0-7-35-140-350 milliamperes
- D.C. AMMETER
0-1.4-14 amperes
- O.C. VOLTS, 25,000 OHMS PER VOLT:
0-3.5-7-35-140-350-700-1400 volts
- D.C. VOLTS, 1000 OHMS PER VOLT:
0-3.5-7-35-140-350-700-1400 volts
- A.C. VOLTS, 1000 OHMS PER VOLT:
0-7-35-140-350-700-1400 volts
- OUTPUT VOLTMETER:
0-7-35-140-350-700-1400 volts
- DECIBEL METER:
0 db to plus 46 db
- OHMMETER:
0-500-5000-50 000-500,000 OHMS
0-5-50 MEGOHMS
- POWER SUPPLY
Battery Operated

With the above specifications the Supreme Model 592 Speed Tester meets today's requirements for general laboratory use, assembly line tests and inspection radio and other electronic repair and maintenance.

SUPREME

SUPREME INSTRUMENTS CORP.
Greenwood, Miss., U.S.A.

MARCH, 1945

radio service dealer

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

VOLUME 6, NUMBER 3

MARCH - 1945

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CHARLES H. FARRELL Advertising Manager

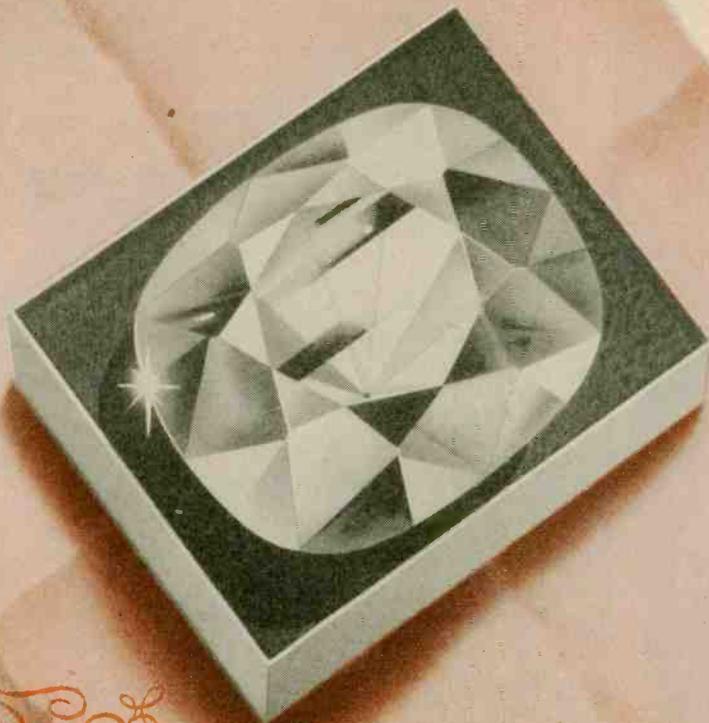
LEWIS C. STONE.....Managing Editor
SYLVIA MICHAEL.....Circulation Manager

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Quality Counts

THE Koh-i-nor is one of the world's most magnificent diamonds. Weighing 106-1/16 carats, it is famous for its brilliance and luster. Of course, a diamond is considered supreme as a jewel because it is the hardest, most imperishable and most brilliant of all gems. The Koh-i-nor's reputation places it in a separate class apart from other diamonds due to its flawless quality—a true example of the fact that, with any product, *Quality Counts*.

THE WARD PRODUCTS CORPORATION, realizing this fact, has long been the leader in the manufacture of one-piece and sectional antennas for automobile and home radios. WARD products are quality products, the workmanship of craftsmen using modern equipment under ideal conditions. Many important design changes pioneered by WARD, have become accepted standards in the industry . . . For quality antennas for all applications, look to WARD.



WARD Antennas



BUY WAR BONDS

THE WARD PRODUCTS CORPORATION
1523 EAST 45th STREET, CLEVELAND 3, OHIO

RADIO SERVICE DEALER

with the editor

Self Service Distribution

TAKING a leaf from the food stores which have developed "super-markets", or glorified self-service stores to a fine point, the radio replacement parts business is adopting the super-marketing technique. Self-service has proven feasible in the phonograph record retailing business. Certainly radio repairmen know what parts and values they need when they enter a store, so they could easily pick the items off a shelf rather than wait to be served by a clerk.

But there is a serious fault to self-service selling that its innovators may have overlooked. A serviceman likes to "chin" with his jobber. He gets valuable news, technical and otherwise, that way. More important, a distributor cannot com-

placently wait for a service dealer to ask to be shown a new piece of test equipment, P-A amplifier or electronic gadget. It takes salesmanship, and technical skill to point out the merits of a radio device or instrument and to prove to a service dealer that the purchase of such an instrument is not an expense, but instead is an investment which is paid back with dividends. In fact, that's one of the troubles with much radio test equipment. A chap is frequently allowed to buy a cheap, inefficient instrument whereas a more expensive model or entirely different type unit would have been a much more advantageous buy. But then it was too late, for the distributors lost a profit, and the service dealer got stuck, for he didn't make a good buy.

Financial Loans For War Vets

THE Veterans Administration has issued regulations for guaranteeing loans to veterans desiring to buy homes or establish independent businesses. The "GI Bill of Rights" authorizes Federal guarantee of 50% of loans up to \$4,000, if the interest rate is not higher than 4%, loans to be repayable within 20 years. Here's how it works: A soldier who has served more than 90 days and who has an honorable discharge goes to a public or private lending agency which he must convince of his ability to repay that part of the loan for which he is personally liable. Then agencies of the VA will ascertain whether or not his ambitions or business plans are probable of success, after which the Federal loan will be granted in full, or in part, determined by the findings. A vet may borrow more than \$4,000

but the government will guarantee only up to \$2,000 of it, just to be conservative.

If equipment is being purchased, the loan must be repaid within a year; loans of more than \$500 within two years. Two or more veterans going into business as partners may each borrow capital, each exercising his own individual rights. Ten partners could thus borrow up to \$20,000. In any event, a very substantial radio-appliance business could be established by a veteran within the limits allowed by VA. Less than \$4,000 will amply serve to establish a small radio or appliance shop and if many discharged veterans carry out the plans they've formulated while operating radio and radar in the service, presently established service dealers may as well resign themselves to the fact that they are going to have plenty of added competition soon.

On Licensing Servicemen . . .

THE "jackpot" issue: Shall there be licensing of radio technicians and servicemen? — which was the subject of a number of editorials during the past several months, has blossomed into a full-fledged "survey".

The Survey Questionnaire which we published in the February issue has brought out responses of radio servicemen and technicians from all over the country.

On page 8 of this issue we print quotes from typical letters sent in by subscribers, showing a wide variety of opinion. And every mail now brings us heaps of questionnaire returns, in many cases accompanied by letters giving detailed suggestions. Some returns carry enclou-

res of booklets describing the workings and aims of service organizations in operation in some localities, which are suggested as models to be followed on a national or regional scale.

The point is, the subject is "hot". We are repeating the Radio service Dealer Survey form in this issue. We refer you to page 42. What is your opinion? Use the questionnaire. You will find it convenient for expressing your views. Send them in. Join your fellow servicemen in this important survey.



In & Around the Trade

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



(U. S. Navy Photo.)

Raytheon's popular radio show, "Meet Your Navy", is host to this happy gang of bluejacket-musicians. The company makes network time available every Saturday evening for them. There are some 20,000 "alumni" members now on naval duty in all parts of the world who took part in this all-sailor air show.

"Merchandising" the Customer

Beginning its third year of broadcasting over CBS, General Electric's new program is designed to acquaint the public with new household electrical appliances that will become available after the war. "House Party" began January 15, and is a five-day-a-week audience participation show, originating from the studios of KNX, Hollywood. Children and adults will have chances to try for prizes of various electrical household appliances. Awards will be made on the basis of studio audience preferences recorded on an applause meter.

Sponsored by the appliance and merchandise department of General Electric with headquarters at Bridgeport, Conn., this new radio program is in direct support of the thousands of G-E appliance dealers throughout the country as a further means of preparation now for postwar business. All G-E appliances and products will be advertised on the program to give listeners an idea of the new things to come so that future purchases can be intelligently planned and saved for when victory assures a return to civilian manufacture. By stimulating people's

wants and desires to own new electrical appliances for better living it is hoped that "The G-E House Party" can be made a job-creating influence by helping to maintain a high level of postwar production.

Better Radio Tubes

"Unseen power" will be built into post-war radios that will make them not only better receivers but more flexible and compact, according to Theodore R. Sills, of the Radio Manufacturers Association.

Perhaps the outstanding contribution of war experience to the improved—but not "miracle"—receivers that will be made shortly after victory has been in tubes. Today single tubes can perform the duties of two or three pre-war tubes, and do a better job. Also, miniature tubes will make possible smaller portables, automobile and tractor radios—and with improved performance.

In addition, progress with cathode ray tubes that go into television receiving units has been outstanding, and the frequency ranges that can be utilized as the result of tube advancements have been greatly expanded.

The result will be improvements in virtually every phase of radio set production, with increased value and listening pleasure for the public.

G.I. Business Training

Special training for veterans and others who desire to own and operate small business establishments will be offered by Western Reserve University, Cleveland. Classes in operation and management of small business were started in January at Cleveland College, Reserve's downtown center on Public Square, by the division of Business Administration of the University. In announcing the new training program, Professor Thomas M. Dickerson, Head of the Division, said, "We believe this will be unique, and so far as we have learned, no other university has offered a course such as we have planned.

"It is designed particularly to help veterans who plan to apply for loans to set themselves up in small business establishments under provisions of the G. I. Bill. But it is also designed to help civilians who are interested in setting up their own establishments and to help present owners and operators who wish to improve their methods."

The course will be intensive, lasting for eight weeks. Each class will be limited to 20 students. The classes will be under the direction of Professor Kenneth Lawyer, associate professor of marketing, who, because of the lack of a suitable text on the operation of a small business, has drawn up a unique plan of teaching. Under his plan of instruction, each student will make a searching analysis of his own qualifications and his chance for success in his own establishment. He will first receive a questionnaire in which he will set forth his plans, the type of business he wishes to establish and the extent he may wish to expand and develop his business.

"Because no great investment is needed, small businesses are easily entered and easily established," Professor Lawyer commented. "Their great problem is continued and permanent existence. The mortality of small business concerns is tragically high. Poor location, competition, changing public tastes, are ever-present hazards. In spite of the high mortality rate, small business establishments are essential to a democratic economy. Operation of small establishments is what the American people usually think of when we talk of 'free enterprise.' Because of our interest in free enterprise, we are anxious to see that it continues to work.

[Continued on page 14]



REMEMBER NATIONAL UNION SERVICE DEALER ADVERTISING

AFTER THE WAR MORE THAN BEFORE

OF COURSE, you remember the cooperative advertising plans that National Union offered you before the war. Radio service dealers all over the country built up their business at minimum cost, using this powerful N. U. plan. They obtained free electros, mats and copy for telephone book and newspaper advertisements—a handsome four-color metal highway display at very low rental—a generous advertising allowance. National Union gave

radio service dealers all this in *addition* to the plan that equipped their shops with 60,000 pieces of fine test equipment *free!*

After Victory, look for more and better N. U. cooperative advertising to back you up. *Count* on N. U. to bring you more business—more profits—**MORE** than before.

NATIONAL UNION RADIO CORPORATION, NEWARK 2, N.J.
Factories: Newark and Maplewood, N. J., Lansdale and Robeson, Pa.



NATIONAL UNION RADIO AND ELECTRONIC TUBES

Transmitting, Cathode Ray, Receiving, Special Purpose Tubes • Condensers • Volume Controls • Photo Electric Cells • Panel Lamps • Flashlight Bulbs

*Immediate
Shipment!*

**RADIO PARTS
and ELECTRONIC
EQUIPMENT**

from **CONCORD**

Our shelves are loaded with top-quality merchandise, dependable brands, complete assortments. Order them from CONCORD, by mail, by wire, by telephone. Our radio technicians are prepared to work with you and expedite special requirements. Tell us what you need. Two huge shipping warehouses, in CHICAGO and ATLANTA, ready to fill your orders and ship to you at once.

**Typical Values
Available NOW!**

Cornell-Dubilier type
TJL6040, 4 mfd. 600
volt DC wkg. oil filled
condenser.
5B3015
Specially priced, **\$1.49**



Full Wave Vibrator
Transformer, 6 Volts.
Input—250 Volts.
60 MA. Output C.T.
5B5000
Specially priced, **79c**

I. R. C. type CS Dual
Potentiometer
2500 ohm and 25 ohm.
5B2007
Specially priced, **49c**



**FREE! 64-Page
"Book of Values"**

Ready about April 1st—big 64-page "Book of Values" offering thousands of hard-to-get parts at substantial savings. Includes new 1945 Revised Listings of standard lines of Condensers, Resistors, Transformers, Test Equipment, and other essential radio parts.

**CONCORD
RADIO CORPORATION**

Lafayette Radio Corporation

901 W. Jackson Blvd. 265 Peachtree Street
CHICAGO 7, ILL. ATLANTA 3, GA.

CONCORD RADIO CORPORATION
901 W. Jackson Blvd., Dept. K-35
Chicago 7, Illinois

Please send me a FREE copy of the "Book of Values" of radio and electronic parts and equipment as soon as it's off the press.

Name.....
Address.....
City.....State.....

RADIO service DEALER

Survey

LETTERS FROM READERS give views on the question: **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?**

WILL STOP ABUSES

I have been following the pros and cons of the licensing question for some time and I am glad that RADIO service DEALER is sending out a questionnaire.

I have been a radio serviceman for more than eight years and I spent a considerable amount of my time and money in acquiring my knowledge. It burns me up to have radio sets come into my shop to be repaired that have been tinkered with by some screw-driver mechanic. There has been any number of abuses by so called radio repair men.

I am in favor of amateurs, etc. provided they stay in that class until they are technically able to branch out.

I am heartily in favor of licensing, as any successful radio serviceman should be.

P. G. Mathews, New Jersey.

PUBLIC NEEDS PROTECTION

I agree with your editorial that the element of human error must be considered. But what about the so-called radio technician who discovers that by grounding the tube cathode of a power tube the set will play, whereupon he shorts the cathode to ground, removes the bias and returns the set to the customer as "repaired"? Has he ever heard of a cathode bias resistor?

What about the man practically shorting the grid of a power tube to clear up distortion—has he ever heard of a leaky coupling condenser overcoming the normal bias of the power tube? What about the man that completely wrecks a set trying to locate trouble and finally in despair tells the customer he hasn't the necessary parts and to take it to another shop.

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.

Why not add the weight of your opinion to this important survey? Turn to page 42, fill out and send in your questionnaire now.

You state that with such men their own shortcomings will remove them from the profession. This is true, but more of them pop up. I have been in the radio service profession fifteen years, full time, and still they come and the chain is unbroken.

I maintain the public needs protection in some way, through some form of licensing.

W. L. Patrick, Miss.

LOCAL RADIO CLUBS

In our city we are having trouble with promiscuous radio servicing. In fact the average radio serviceman has been classed along with a ditch digger,

[Continued on page 10]

*Top Flight
Dealer Cooperation
...you'll have it with*

NUMBER
FOUR
IN THE PARADE
OF REASONS
Why
You'll Profit
with **ARVIN**

ARVIN
Top Flight
RADIOS

BECAUSE Arvin sales policies are the outgrowth of 25 years of successful experience in providing the fullest support to the dealer. Arvin radios are liberally advertised—nationally and at point-of-sale. Attractive prices provide adequate profit margin for the dealer on every model—and a competent, energetic promotional organization works with Arvin dealers for maximum sales success.

ARVIN MEANS RADIO SALES SUCCESS

Others of the Many Reasons Why You'll Profit with Arvin Top Flight Radios

● **Top Flight KNOWN NAME**—*Because* Arvin products have been backed by national consumer advertising every year for 20 years—and all during the war years. Arvin is a radio name well-known to millions—a name with consumer acceptance that makes it easy for radio dealers to quickly re-establish a profitable business in days ahead. You will serve more customers, faster—with Arvin.

● **Top Flight NATIONAL ADVERTISING**—*Because* Arvin Radios will be advertised in The Saturday Evening Post, Collier's Weekly, Life, and other leading national magazines. Dominating, full-page space will be used—supported by local newspaper campaigns. Other dealer sales-helps will include floor displays, counter cards and consumer folders—exactly what you need to build sales.

● **Top Flight MERCHANDISING**—*Because* Arvin dealer merchandising support is aggressive and effective—directed by G. W. (Tommy) Thompson and other experienced radio men. These men have ably demonstrated that they understand the dealer's problems and his methods of getting business. They can help you. With Arvin you can count on really effective merchandising cooperation.

NOBLITT-SPARKS INDUSTRIES, INC., COLUMBUS, INDIANA

only the ditch digger makes more money.

A group of us called a meeting to form a committee to have legislation passed for licensing radio servicemen. The qualifying examination was among the first things discussed, and our findings may be summed up as follows:

1. The average man when handed a pencil and paper for an examination gets frightened, whereas the average high school student, without any experience whatsoever, could pass it with flying colors. This was the experience of the Services when they asked for technically qualified men.

2. Legislation would have so many loopholes for cheating that, to enforce it, an officer would have to be placed in every shop. Because if a man is so minded he would just overlook it, putting it mildly.

3. Passing a practical work examination doesn't come anywhere near to stopping any shop from exchanging or stealing tubes. Neither will it stop some from sticking a pin through an oscillator coil or hooking up the AC line to the filaments of a battery-operated set when the customer thinks the radio is costing too much to repair.

Our approach to the solution therefore was the forming of a radio club of a social nature based on the principles of most radio organizations. We believe that when an organization has the respect of the community the average radio man would want to belong. We also believe that when a man meets others in his line of endeavor, he will acquire a respect and a knowledge of his fellow-man. Also, he may alter his ways (if they need altering) because of closer contact and assimilation, without the use of force.

The charter members are held down to fifteen, because if everyone was invited the only results would be chaos and confusion. The initiation fee is \$25, which is high enough to keep up the interest in the club and also to have a man think. Monthly dues are \$3.

S. Allen, Arizona.

WARNS OF LICENSE RACKET

An editorial in your December issue discussed the question of municipalities licensing radio servicemen. Some years ago the writer had a chance to observe the application of such regulation in force in a city in one of our southern states. In his opinion its application served to perpetuate control of radio

[Continued on page 12]



is another phase of

WAR . . .

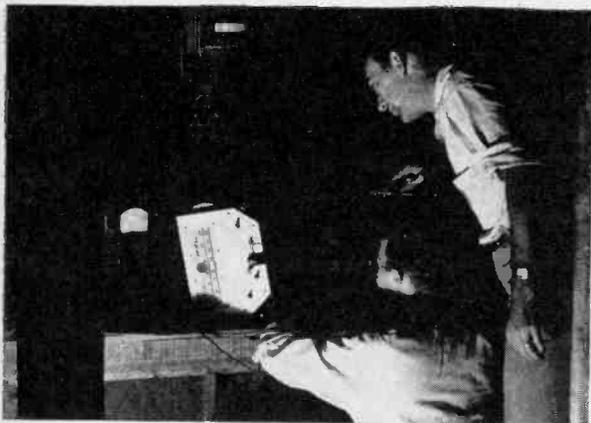
THEY call it LOGISTICS in war... the difficult science of getting supplies to the fronts where they can be used. Post-War Reconversion will involve the same problems... just another phase of war itself.

CORWICO Wires, so long practically non-existent for American industry because of our national emergency, will figure importantly in the new Logistics of Reconversion. Soon you will be able to get these scientific strands for peacetime uses... and the world will stride into a new era of construction and expansion in which you'll no longer be *doing without*...

 **cornish**
WIRE COMPANY, INC.
15 Park Row, New York City, New York
"Made by Engineers for Engineers"



Skilled fingers check every connection before this Meissner electronic equipment leaves Mt. Carmel, Ill., its destination—"Somewhere with the Armed Forces." This "precisioneering" 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 "precisioneering" 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 Ferrocort 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: Simontrice

Station KEX to Westinghouse

Lee B. Wailes, general manager of Westinghouse Radio Stations, Inc., announces the firm has taken over operation of radio station KEX in Portland, Oregon. "Purchase of the station for \$400,000 demonstrates again the confidence of our company in the business and industrial future of the Pacific Northwest," Mr. Wailes said. "It follows by only a few months the investment of approximately \$100,000 by our manufacturing and repair department for new Portland quarters and facilities."

At the time this purchase was ap-

proved by FCC, it also approved the sale by Westinghouse of station WGL, Fort Wayne, to the Farnsworth Television and Radio Corporation. The sale of both stations complies with the recent FCC order limiting ownership by a single operator to one standard broadcast station in a community. According to Mr. Wailes, KEX will keep pace with the rapidly developing and expanding radio broadcasting industry. Plans call for the ultimate addition of FM broadcasting and eventually, television. But fulfillment of these plans must await the successful conclusion of the war.

SURVEY

[from page 10]

service business by a few well established dealers and insure them against competition. In fairness to the city it may be stated that these conditions were observed several years ago. Since then the set-up may have been improved.

This writer was acquainted with one individual whom he knew to be an excellent radio technician and holder of a Federal First Class Radio License. This man wanted to do radio service work as an independent but strangely enough failed to pass the relatively simple municipal radio examination though previously able to pass the highly technical examination put out by Uncle Sam.

This is what we must guard against in advocating local licensing of radio service men.

All of us abhor the blot on the radio service trade caused by the many unskilled "screwdriver and plier" mechanics who, without restraint, can set up in business and call themselves "radio technicians." These charlatans butcher radio sets at cut-rate prices or the other extreme—"hold-up" prices—and arouse the public's suspicion and ill-will against the entire radio service enterprise.

As the situation exists today in the radio service field our customers have no way of knowing who will or who will not handle their proper sets with proper care and skill except by costly trial and error. Is it any wonder they suspect everyone after being stung once?

Licensing—by other than city authorities—is the only ultimate solution and no better example of its efficacy can be found than that inaugurated long ago by the Federal government in licensing radio operators. An individual's level of skill and ability as a radio operator can be instantly determined by the class of Federal license he holds. Politics does not enter into this licensing. The integrity of the U. S. examining inspector is without question and the result is that these licenses really mean something.

M. K. Lock, Florida.

PREFERS SERVICE ORGANIZATION

All servicemen in the field today were at one time the same men that licensing requirements would tend to eliminate. I believe that voluntary service organizations can accomplish more than compulsory licensing. The plan could not be administered fairly.

R. Everard, Jr., Mich.

One of a series of Electro-Voice advertisements explaining in detail the applications and specifications of Electro-Voice microphones



... a general-purpose dynamic microphone with an exceptionally wide and flat frequency response—for both indoor and outdoor speech and music pick-up—is required...

Electro-Voice MODEL 630

This versatile, moderately priced microphone is excellent for public address, all types of dispatching and call systems, paging systems, churches, auditoriums, hotels, recording studios and broadcast remote pick-ups. Though somewhat lighter in weight, it is a sturdy microphone, built with typical Electro-Voice care to serve satisfactorily over a long period of time. Attractively styled, it is finished in lustrous chromium. The Model 630 is unusually flat through lower and middle register, rising 5 db on upper frequencies for added crispness of speech. Operates efficiently in salt air and humidity.

OUTPUT LEVEL: Power ratings: 54 db below 6 milliwatts for 10 bar pressure. Voltage rating (high impedance) 7 db above .001 volt/bar, open circuit. Voltage developed by normal speech (10 bars): .0224 volt.

FREQUENCY RESPONSE: 40-8000 c.p.s., with slightly rising characteristics.

WEIGHT: 1½ pounds.

TILTABLE HEAD: 90° tiltable head for directional or non-directional operation.

CABLE CONNECTOR: Built-in cable connector permits movement of head without moving the cable.

CASE: Built of highest quality, high impact pressure cast metal.

TRANSFORMER CORE: Nickel alloy; hydrogen annealed; low capacity windings.

DIAPHRAGM: Fine quality, heat-treated duralumin; corrosion-inhibited for use in salt air and humidity.

CONDUCTOR CABLE: 20-ft. well shielded cable and connector; low impedance balanced to ground.

HI-Z (DIRECT TO GRID) or 50, 200, 250 and 500 ohms.

SCIENTIFICALLY DESIGNED GRILLE: Reduces wind noise.

ON-OFF SWITCH: Standard ¼" — 27 stand coupler.

MAGNETIC CIRCUIT: Employs Alnico V and Armco magnetic iron.

List Price, \$30.00

Contact your nearest radio parts distributor today. His knowledge of Electro-Voice microphones may aid you in selecting the appropriate type for your individual need. He may also be an important factor in speeding your order.

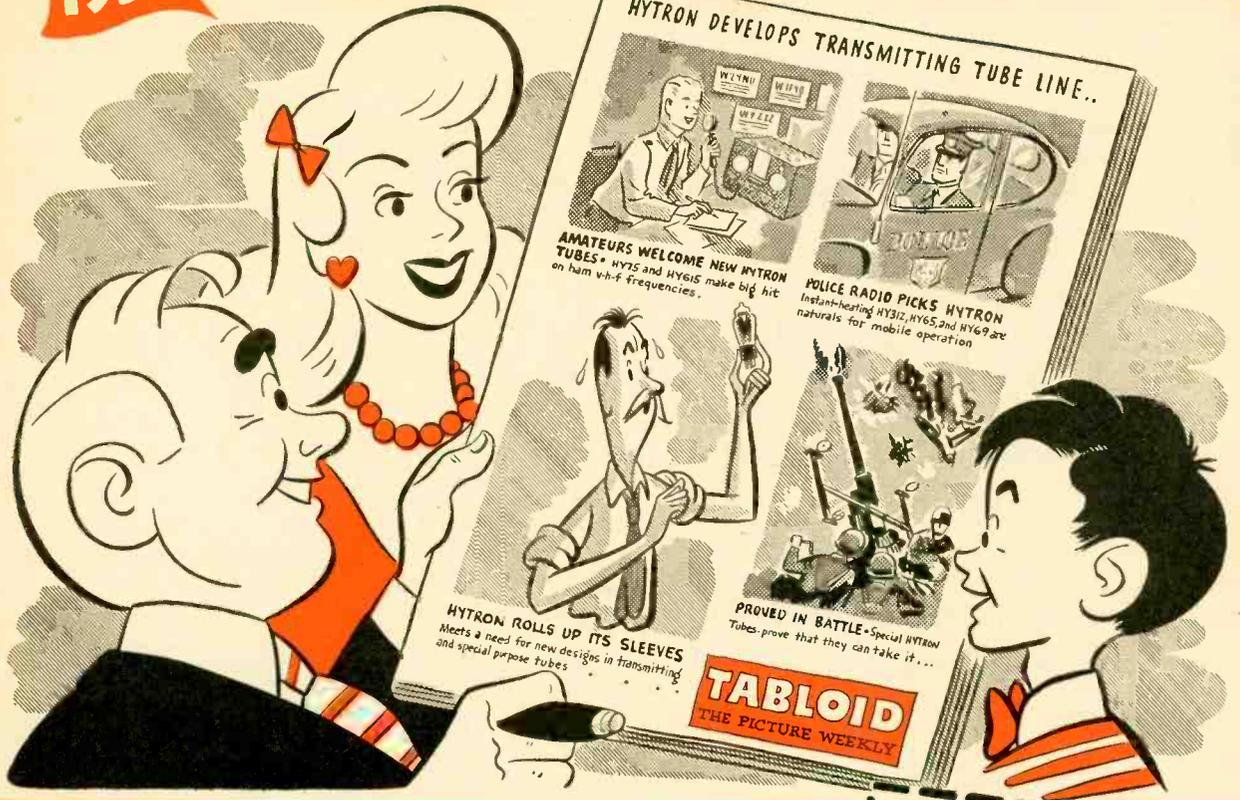
THE RED CROSS
ASKS YOUR HELP
... GIVE GENEROUSLY

Electro-Voice MICROPHONES

ELECTRO-VOICE CORPORATION • 1239 SOUTH BEND AVENUE • SOUTH BEND 24, INDIANA
Export Division: 12 East 40th Street, New York 16, N. Y. U. S. A. Cables: Arlab



1938 IF YOU WANT THE JOB DONE RIGHT...



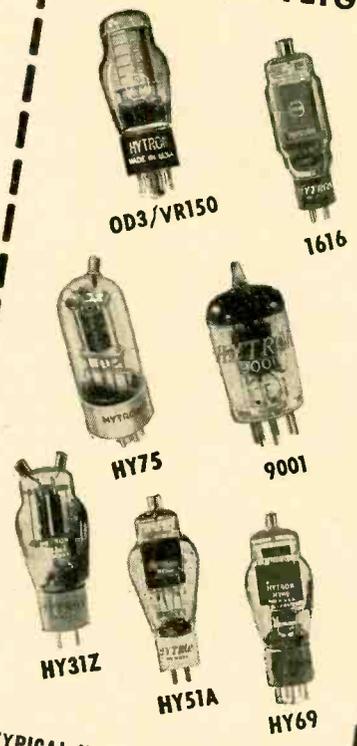
A group of Hytron engineers decided in 1938 that to get those ideal tubes for "ham" radio — they must build them themselves. Combining years of experience in tube manufacture with exact knowledge of the tube characteristics desired, they went to work.

First they concentrated their efforts. Low and medium power types were most needed by the majority of hams. Hytron was equipped to make them. Gradually the engineers translated ideals into a comprehensive line — v-h-f triodes and pentodes, low and medium mu triodes, instant-heating r.f. beam tetrodes, and sub-miniatures.

Hams themselves, the engineers knew their brain children would be given the works. They built the tubes rugged; rated them conservatively. And did the amateur go for them! The v-h-f types — HY75, HY114B, HY615 — soon became accepted standards. Today's WERS operators use them almost exclusively.

Performance in the proving ground of amateur radio was the proof of the pudding. You will find Hytron transmitting and special purpose tubes in war and civilian jobs of all kinds. Like the BANTAM GT and BANTAM JR., they are popular because they are built right for the job.

HYTRON HYLIGHTS



TYPICAL HYTRON TRANSMITTING AND SPECIAL PURPOSE TUBES

BUY ANOTHER WAR BOND



OLDEST EXCLUSIVE MANUFACTURER OF RADIO RECEIVING TUBES

HYTRON CORPORATION ELECTRONIC AND RADIO TUBES

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

YOU...and your PRIORITIES

★ War conditions and disruptions cannot disappear in much less time than it took to create 'em.

★ You had better recognize that "controls" darn near **MUST** hang on for two or three years more.

Priorities affecting YOU are easy to learn

1. Your business maintenance and operation priority is AA-5. That gets test equipment, a tube for YOUR oscillator, cement, wire, your needs for your USE.
2. Any time you do work for a business (lawyer, doctor, restaurant, coal yard, etc.) on business equipment, they can give you an AA-5. **GET IT AND USE IT.**
3. Priorities are **BETTER** than L-265 or just repair needs for the ordinary public.

Ask for our bulletin on priorities that affect and help you do better business, better.

Electronics Specialists



Consultants • Expeditors

In Trade

[from page 6]

We are hopeful that such a course as we have designed will become a definite contribution to its success."

The classes are to start about the middle of January, before the spring term begins. At the close of the first eight-week series of classes, the course will be repeated and will continue to be repeated until the demand for such training has been satisfied. Professor Lawyer, as a former member of the research staffs of the University of Illinois and the University of Pittsburgh, has made special studies of the problems of the smaller distributive and service businesses. His teaching methods are the outgrowth of the statewide training program for the State of Illinois in 1940 and 1941. Approximately 6800 merchants and their employees were trained.



Edward C. Bonia

Sparton Appoints

Harry G. Sparks, president, the Sparks-Withington Company, Jackson, Mich. announces appointment of Edward C. Bonia as General Sales Manager of the Radio and Appliance Division. Mr. Bonia has been with the Sparks-Withington Company for about 15 years, serving as Eastern Sales Manager since 1940.

Mr. Bonia, who has been closely associated with the success of the Sparton Cooperative Merchandising Plan, says, "The Sparton Plan will be continued without any fundamental changes. While our initial sales effort in the postwar period will be put behind the aggressive promotion of a new and complete radio line, new products will be added when they can be introduced with full confidence that they will come up to the high standard of excellence for which Sparton radios are world famous."

[Continued on page 36]

SYLVANIA NEWS

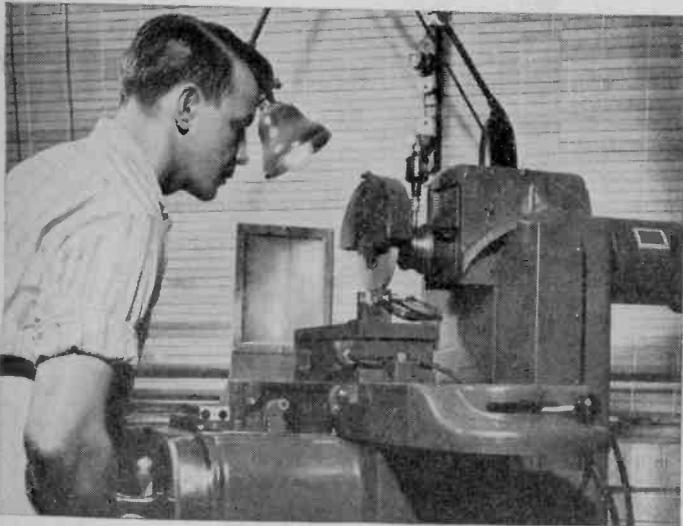
ELECTRONIC EQUIPMENT EDITION

MARCH

Published in the Interests of Better Sight and Sound

1945

Well-Equipped Sylvania Plant Makes Own Small Parts to Assure Top Quality in Radio Tubes



Many of the special tools required for turning out small tube parts are tailor-made right at Sylvania's Emporium plant.

To insure that all Sylvania-made radio tubes will be of the very best quality, the well equipped tube plant in Emporium, Pennsylvania, provides extensive facilities for making over 8500 of the delicate small parts that go into Sylvania tubes.

Each month over 600 million small parts are turned out. In making these intricate parts, Sylvania craftsmen work with a variety of metals such as tungsten, steel, copper, phosphor bronze, beryllium copper and tantalum.

The Emporium staff includes highly skilled production engineers, tool and design men, and expert tube makers.



By a sampling method, watchful Sylvania inspectors carefully study each batch of small parts for detailed perfection.



Tiny tube parts are magnified and their outlines superimposed on scale drawings to insure meeting the extremely close dimensional tolerances required.

SYLVANIA ELECTRIC

SYLVANIA ELECTRIC PRODUCTS INC., Emporium, Pa.

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



Thanks!

TO thousands of service engineers here in America, Mallory owes a debt of gratitude. For a long time now many of you have preferred to use Mallory Vibrators. But quite often during the past two years, our distributors have been unable to fill your orders.

Of course there has been good reason for this. With the outbreak of war, radio components for military use were needed in enormous quantities. Quality considerations too, were of the utmost importance.

Our vibrators were able to meet the most exacting tests. We were also the largest producers. As a result, our facilities were taxed to the utmost; we were unable to keep up with civilian demands.

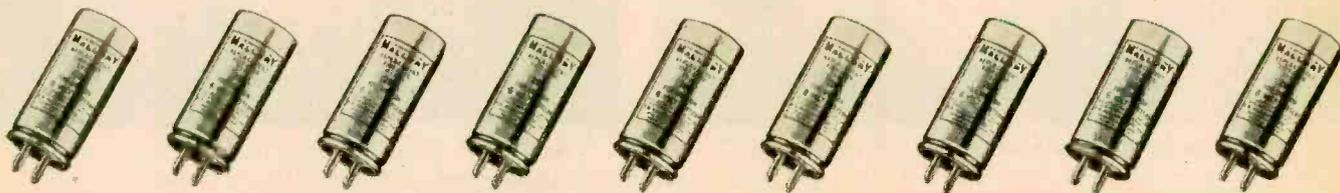
We think you will be glad to know that today Mallory vibrators are in planes, tanks, portable radios and many other types of equipment on every fighting front. Not only are they serving American forces, but those of all our allies. These are the vibrators you did *without*.

Now, with production several hundred percent greater than in 1942, Mallory vibrators are again available for civilian use. Always noted for dependable performance, they are today even better *than ever*. So look for the familiar orange and blue carton on your distributor's shelves. You've had a long wait for Mallory vibrators—but the wait has been worth while!

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



Distribution of Mallory vibrators is being made as rapidly as possible. If your distributor has not yet received his supply, please bear with him.



*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

Lines Dealers Will Handle

Household refrigerators, with 93.2 representations, will be the appliance sold by the largest number of dealers, as it was before the war. Vacuum cleaners with 86.3, and radios with 85.6, are next in dealer popularity. Following these three, the table appliances (toasters, etc.) will be sold by 82.7 per cent of the dealers replying. The electric range is due for greatly increased representation, with 84.4 of the dealers saying they will sell this appliance. The washing machine answer was divided into two parts, with 77.9 per cent saying they would sell automatic machines, and 76.6 per cent specifying conventional type machines.

Among the surprise favorites for post war among dealers are: hearing aids, 14.8 per cent; room coolers, 52.5 per cent; and kitchen cabinets, 48.8 per cent. The cabinet figure indicates

WHAT PUBLIC WILL BUY (Within Six Months After Victory)

ANSWERING questions posed by the United States Chamber of Commerce in its third survey of post-war needs, the American public lined up on the "buying front" for major electrical appliances, some of which are shown:

- 2,625,000 families intend to buy Refrigerators
- 2,555,000 families intend to buy Radio Sets
- 2,100,000 families intend to buy Washers
- 1,645,000 families intend to buy Ranges
- 1,505,000 families intend to buy Irons
- 1,400,000 families intend to buy Cleaners.

The above figures represent a portion of the market for radio and appliance dealers in terms of consumer buying intentions within six months after Victory. Almost 14 million families who responded to the survey expressed their intentions to buy one or more major household appliances with an estimated value of \$1,215,910,000 at dealers' selling prices.

See next page for more details.

Selling Preferences

by WARD R. SCHAFER

General Sales Manager, Edison General Electric Appliance Co.

the approximate number of dealers who plan to sell complete kitchens. The great popularity for complete appliance ensembles for kitchens will carry the electric dishwasher, garbage disposal, as well as metal base- and wall-cabinets to new highs in acceptance.

Dealers volunteered hundreds of comments on their survey cards. These comments included opinions as to post war prospects, views on dealer aids expected from manufacturers and distributors, and other comments, indicating that, far from being in a state of suspended animation, the radio and appliance dealer is perhaps the liveliest merchant in his community.

Too much emphasis cannot be placed on the importance of the dealer's new place as a serviceman in his community. He is now known as a friend of hundreds of his neighbors. This new relationship has changed his position in the community, and we have heard from many dealers who have long lists of 'applications' for specific appliances as soon as they are available.

Since the curtailment of the manufacture of appliances, what lines of other types of merchandise have you been selling that you did not handle before the war? _____

Which, if any, of the above items do you intend to continue to sell in postwar? _____

In postwar, which of the following appliance lines do you intend to sell?

- Household Refrigerators
- Household Frozen Food Cabinets
- Electric Ranges
- Gas Ranges
- Space Heaters
- Dishwashers
- Non-Electric Cabinet Sinks
- Garbage Disposal Units
- Conventional-Type Washers
- Automatic-Type Washers
- Electric Clothes Dryers
- Table-Top Ironers
- Portable-Type Ironers
- Radios

- Hearing Aids
- Electric Water Heaters
- Gas Water Heaters
- Room Coolers
- Ventilating Fans
- Kitchen Cabinets
- Table Appliances
- Vacuum Cleaners

Of the major appliance lines you will sell in postwar, how many brands of each line do you intend to handle?

- One
- Two
- Three
- Four

Is your present store located in:

- Downtown Area
- Neighborhood Shopping Center
- _____

What is your type of store?

- Department Store
- Furniture Store
- Hardware Store
- Appliance Speciality Store
- _____

We are not asking that you identify yourself by revealing your name or street address, but for the purpose of this study, we will appreciate it if you will give the name of the city in which you are located.

CITY _____

WHAT Customers Will Buy

13,755,000 families surveyed by United States Chamber of Commerce list appliance buying intentions within six months after Victory. Dealers are formulating plans to cash in on huge radio and appliance demand.

IF Victory came tomorrow, the greatest flood of consumer buying power would be released within six months with purchases of one or more major articles, among which millions of electrical household appliances take top rank.

This is the carefully checked conclusion of the "Third Progress Report" recently issued by the United States Chamber of Commerce as the result of a nation-wide consumer and industry survey of post-war needs. Both the original study and recheck were designed to supply a factual basis for answering three fundamental questions:

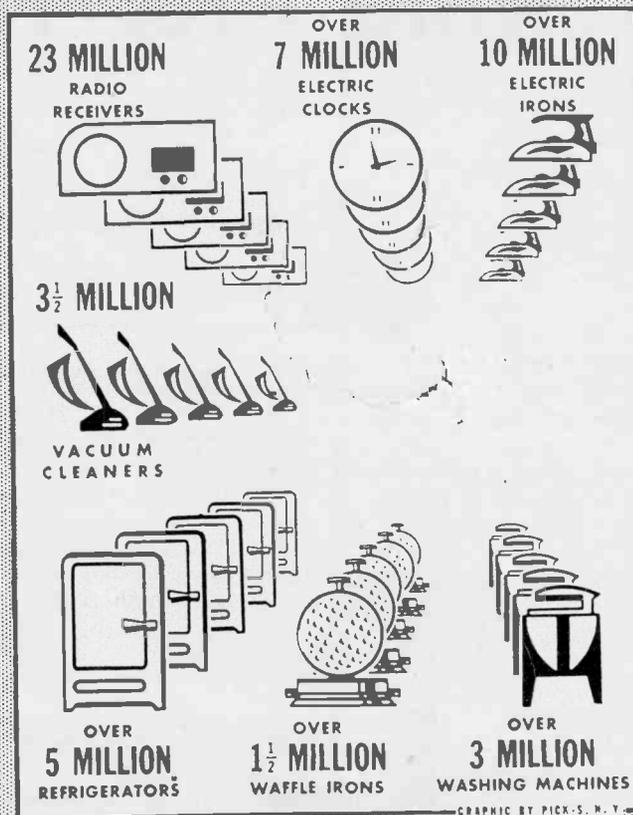
1. If the war should end tomorrow, what is the one thing you would most like to buy?
2. Would you certainly buy within six months, or do you think you would wait longer than that?
3. How much money have you got to buy with?

Although the results cannot be considered predictions of actual post-war purchases, they can logically be used with safety in reflecting current inclination to buy.

What's In It For Dealers?

A few facts taken at random from the Chamber of Commerce report reveal an amazing selling opportunity which will be opened up to every radio and appliance dealer in every section of the country.

Some 13,755,000 families intend to buy one or more major household appliances to the tune of \$1,215,910,000. This figure does not include any electric



THE DEPTH OF THE MARKET: This chart shows the overall potential demand for radios and appliances, as estimated by the Research Advisory Board, Committee for Economic Development. The figures given in the above article and shown in table on page 19 represent an estimate of the portion of overall market which will actually buy soon after Victory.

10 Points

ABOUT GOOD WILL

by **JOHN MECK, PRESIDENT**

John Meck Industries, Inc.

The dealer has a rosy future. But unless he has a planned campaign to establish public relations, much of his efforts can be wasted.

STORIES have been appearing in newspapers all over the country about the little black notebooks carried by long suffering customers of retail establishments, restaurants, transportation companies, etc. A lot of us, who are buyers, have been annoyed to the boiling point by the too often repeated, "Don't you know there's a war going on?" and will welcome the return of the buyers' market. Then, we can demand proper courtesy and polite treatment.

There is much to be said for the man or woman on the other side of the counter. We are all of us working longer hours—many times under annoying conditions, beset by war anxieties and the tremendously increased difficulties of doing even the simplest things in war times.

To the radio dealer I can say that I recognize all these difficulties, and I know too that the customer is not always right, but I realize too, and so do you, that a time will come when you may be much more anxious for the customer's goodwill than you may be today. The smart-alec thinking behind signs such as some grocery stores have posted, "Be kind to our clerks, customers we can get" is not sound public relations thinking.

When the victory is won we will be making radios. We shall be working through jobbers and we shall be extremely jealous of our very fine relationship with the radio retailer. We

shall be anxious to work with him because of his relationship with the ultimate consumer. We know and understand the problems of radio retailing.

The local radio dealer is a radio specialist. His years of experience

and technical knowledge enable him to serve his customers to their advantage. Thus, he fully knows what he has to sell, but does he realize that he must also give?

We all realize that common courtesy and a friendly attitude are business requisites. It is to keep that in mind, as well as for purposes of review, that this article is written. Today, more than ever, a sound public relations program is a "must" for radio dealers. The war weary public welcomes a friendly attitude and common courtesy. And, most important, he remembers the dealer who tries to understand his problems and gives sympathetic advice.

The following ten points have been tried and found profitable for many dealers. Most of them are points that any business man could use as a guide for establishing good public relations.

1. Try to know your customers by name; remember that you are part of a privileged group that goes into our customers' homes. You have an opportunity to learn the names of the members of the family; ask about them when you see your customers.

2. Be sure you satisfy your customers. Even if your customer makes unreasonable demands, explain in detail why you have done what you have done. If an error has been made and the fault is yours be the first to say so.

3. Be courteous, be polite even if the customer isn't. If you both get angry you lose the customer anyway and your blood pressure goes up.

4. Be neat on the job and in your store.

5. Keep your promises. Don't promise what you can't deliver. Give yourself plenty of time.

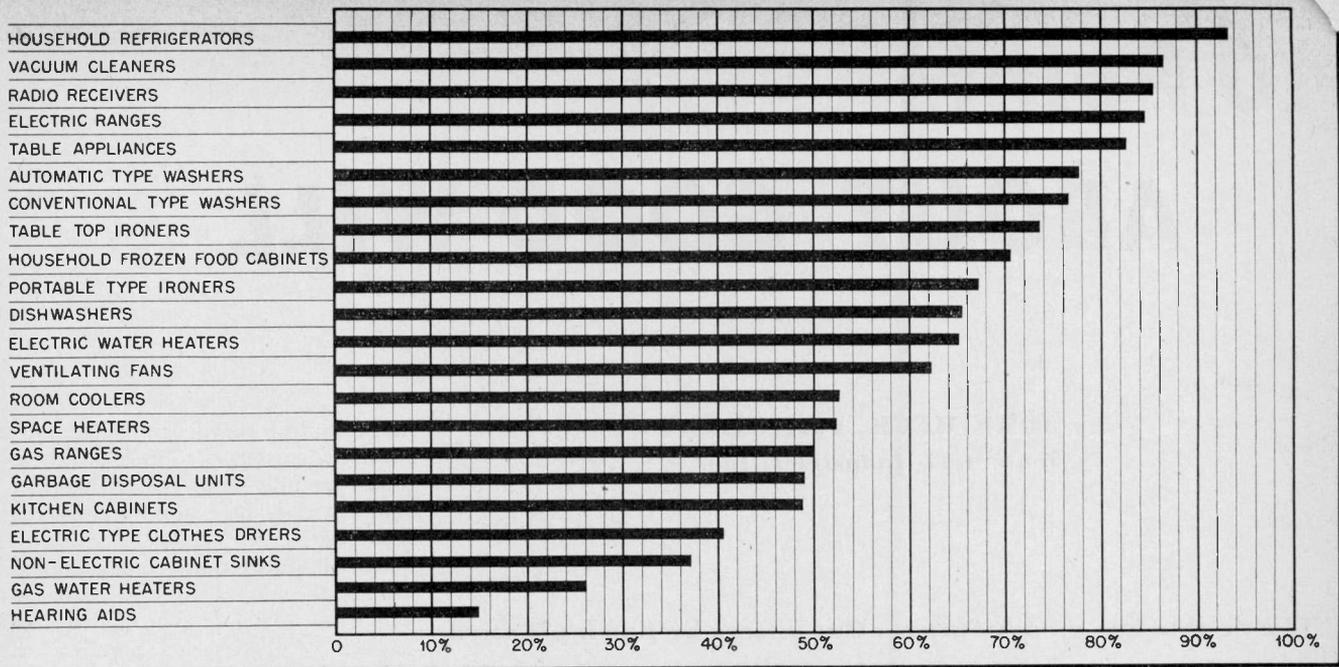
6. Be fair in your prices. If you are in doubt, overquote. It will be an agreeable surprise to your customer when the job costs less than the estimate.

7. Be prompt. If it is a home call, be there when you have promised to be there. If you tell a customer his set will be ready in your store Wednesday, have it ready.

8. Be an aid to the community. Enter into civic activities if you can. Organize to keep the radios repaired in the local military service hospital. Start a campaign with other radio dealers to get two way radios put in your local police cars. Be active in things that are an aid to your community.

9. Be reasonable about your promises for tomorrow's radio. Post war radios will be better. Don't however, allow your customer to believe that FM and television and miracle reception will be his the day the war is over.

10. Whenever possible, explain the job to the customer. Don't let him think that you pocket the whole repair charge. Point out how much is spent for parts; bring out, without bragging, your own technical skill, and experience, and training and sell yourself and your service. Be sure the customer appreciates you.



Above: Appliance lines are shown in ranking order. Below (opposite): The questionnaire which went out to dealers in this survey of post-war plans.

Dealers Forecast

DEALERS WILL SELL

	% Total Answers
Household refrigerators	93.2
Vacuum cleaners	86.3
Radios	85.6
Electric ranges	84.4
Table appliances	82.7
Automatic type washers	77.9
Conventional type washers	76.6
Table top ironers	73.8
Household frozen food cabinets	70.6
Portable type ironers	67.3
Dishwashers	55.6
Electric water heaters	65.3
Ventilating fans	62.1
Room coolers	52.5
Space heaters	52.2
Gas ranges	50.0
Garbage disposal units	49.1
Kitchen cabinets	48.8
Electric type clothes dryers	40.3
Non-electric cabinet sinks	37.2
Gas water heaters	26.0
Hearing aids	14.8

Many dealers have long lists of 'applications' for specific appliances. Servicing of radios and appliances together with added wartime lines, increase prestige of dealer as serviceman in his community.

ENTERING their fourth year without new merchandise to sell, radio and appliance dealers have added more than three hundred other items to sell as a means of staying in business, according to returns shown by a survey among 17,000 dealers. Paint, furniture items, glassware, floor coverings, wall paper, seeds, luggage, roofing, hearing aids, books, and used cars are listed as added lines taken on by appliance dealers. More than 80 per cent of the 2,165 dealers replying to the questionnaire said they would keep one or more of the substitute lines in post war.

Listed as other means of continuing in business were repair and parts service for appliances, supplied by 12 per cent more dealers during the war period than normally; appliance "swapping," by which broken devices

are repaired and restored to use; and doing other types of repair work necessitated by restricted service on all types of equipment.

The poll is a result of a home study course in wartime operations and peacetime merchandising being sent monthly by Edison General Electric (Hotpoint) Appliance Company to 17,000 appliance dealers across the country. Of those receiving the course, 47.9 per cent are specialized appliance dealers, 17.1 per cent are furniture stores, 12.9 are hardware stores, while 5.5 per cent are department stores. Public utilities and others make up the balance of the enrollment.

The questionnaire, enclosed with one of the regular monthly lessons, included ten questions on a self-mailing card. The first question asked was, "In post war, which of the following appliance lines do you intend to sell?"

appliances that will be bought for commercial use. Nor does it include such appliances as mechanical refrigerators or ranges bought as normal equipment for apartments, etc. Nor does it include the export market. This figure does represent, however, the domestic consumer buying intentions within six months after Victory.

The report also indicates that not only are people planning early post-war purchases, but they have or are accumulating the necessary money to make the purchases. There is little indication that the prospective market is composed of wishful thinking.

Radio and appliance dealers must consider, therefore, that this market already is in existence and only waits for the day when production bars are

dropped and full-scale civilian manufacturing is given the go-ahead.

It's squarely up to every dealer to set up his plans in advance so that he will be ready to take full advantage of the certain and unprecedented demand for radios and appliances. By determining his

*operating policies
merchandising plans
advertising plans
promotion plans
sales organization*

now, he will be able to move into action fast and keep in step with the greatest sales and profit-building opportunity he has ever enjoyed.

Note: As interpreted by Westinghouse Electric Supply Co.

entire stock of used and reconditioned merchandise, or use whatever may be left over for repair parts.

Visiting with farmers one or two days each week, Williams finds out what if any items they may wish to dispose of. At the same time, he asks what new appliances they might want to buy most when the war ends. Many families are interested in air conditioning and television. Today the average farm family has the money and the only question is whether or not for the first few months after the war the items will be available to meet rural as well as city needs.

Williams promotes and merchandises his "Sell and Swap" department in a number of ways. He runs a display ad in country newspapers once weekly, listed items he has and those he is open to buy or swap. He also distributes postcards to all farmers in his territory. Whenever a farmer wants an item or has something he wants to swap, he mails the card to the dealer who stops by on his next trip. Transactions are completed then and there, or the farmer may call at the store following the dealer's visit.

During the past year, this dealer has taken in several hundred items paying for them in kind or in cash, and disposing of them in the same manner. In many instances his profit has not been great but he has brought many customers into his shop looking for bargains who might otherwise never have come in.

One phase of Williams' operation which should be of special interest to other service dealers is that he has begun to take orders for post-war merchandise, tying in with promotions of radio manufacturers.

Operates

"Sell and Swap" Plan

Small town dealer accommodates many customers now, is sure of fair share of post-war sales of varied lines of home and farm electrical appliances.

LEROY WILLIAMS of Lowville, N. Y., has, in common with many another radio service dealer, one chief difficulty — the securing of tubes and other components for radio repair. To offset the resulting gap in his earnings, he has established a "Sell and Swap" department. Any farmer or rural resident within reach of this establishment may bring in a toaster, percolator, iron or other device for outright sale or to swap.

What he pays for any item depends upon the condition and upon the resale price which he may reasonably hope to get. The fact that the war with Germany may be nearly over does not worry him too much, for he expects it will take sixty to ninety days from then before new civilian goods come off the assembly lines and onto the dealers' shelves. During that interval he expects to be able to clean out his

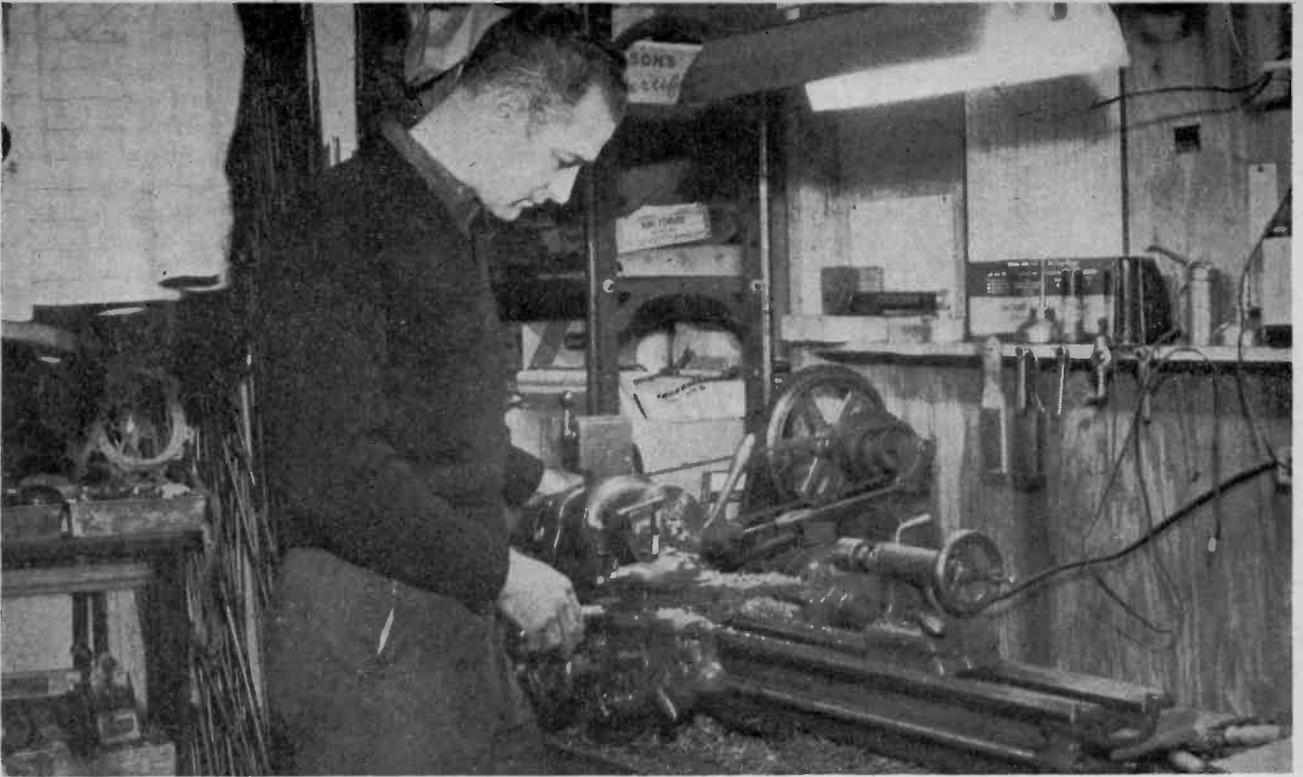
APPLIANCE SWAP PROGRAM

Because of the recent War Production Board "cut-back" order on the manufacture of civilian electric appliances, Chicago's city-wide "swap" campaign to unearth used time- and labor-saving devices for war workers' families has been resumed. E. M. Ball, manager of Commonwealth Edison company's dealer cooperation department, announces. More than 250 dealers are expected to participate in the drive, which will be supported by newspaper, radio and car-card advertising.

Originally launched in October, 1943, at the request of the WPB after a survey revealed a close relationship between the lack of appliances in workers' homes and absenteeism in war

production plants, the "swap" program netted 50,000 appliances in one year's time. In the new campaign, as in the old, Chicagoans with out-of-order or unused appliances in their homes will be urged to exchange them for war stamps. Dealers will repair the devices and offer them for resale. Electric irons, washers, vacuum cleaners, refrigerators, toasters and clocks are especially needed.

Although Commonwealth Edison company will supply advertising and other promotional aid for the "swap" drive, its own stores will not engage in the activity. For the convenience of the public, however, the utility will maintain a list of participating dealers.



PROFITS — in Diversified

DIVERSIFIED merchandise and service has helped the Kallal Appliance Shop, De Kalb, Ill., get through the war period thus far at a profit and put it in an excellent position to be able to get its share of the postwar business.

C. V. Kallal, owner of the firm, has a service crew of 6 men who handle a considerable variety of jobs in De Kalb and in rural areas nearby. Radios, refrigerators, washing machines, electric milk coolers, vacuum cleaners and other appliances are serviced, with each man handling a certain job. Altogether, this six man service crew handles a lot of work. The contacts made are very numerous.

Specialized Servicing

The radio serviceman spends most of his time at the bench every day, for the volume of jobs is considerable. Customers are asked to bring in their own radios and to call for them when finished. The only exceptions to this rule are when invalids, etc. have no

Dealer in midwest employs specialists to service radios, washing machines, refrigerators and farm milk coolers. Also handles mixed merchandise lines.

by **W. DELAFIELD**

way to get their radios to the shop for service.

The refrigerator and washing machine serviceman works part of the time in the service shop and part of the time in the field. Heavy appliances are brought to the shop for major repairs. Minor repairs and servicing are done right in the home. This service man also goes into rural districts to service electric milk coolers. These appliances are playing a very important part in the food production program necessary to win the war and

need to be kept in proper working order at all times. Insofar as the gasoline allowance lasts, many such calls can be covered.

The Kallal shop has the proper tools and equipment needed to make washing machine and other appliance repairs. There is a small lathe, drill press and other tools to help service men perform quality repair jobs in the shortest possible time. Proper lighting for such service operations is also important and the Kallal shop is well equipped in this regard.

The shop is equipped to handle servicing and repair of a wide range of appliances by having a specialist for each line. Opposite: one of the crew of 6 specialists at his lathe on a refrigerator repair. Opposite: the radio specialist concentrates on benchwork most of the time. Other servicemen work in the field as well. Below: sales clerk displays a model plane made from parts sold in the store together with other fill-in items.



Merchandise and Service

Mixed Merchandise

In the merchandise line, this dealer has taken on a number of items which all help to increase the volume of business and add to the store traffic. Mr. Kallal has a big stock of model airplane parts which is very popular with children, who often bring their parents into the shop to buy such materials. Many of the parents also become appliance repair customers.

The store also sells some roofing materials, a line which fits in well with the sheet metal work done by the company. At certain seasons of the year the roofing and sheet metal work provides considerable volume. Dog harness is another minor line which was taken on and which moves fairly well. At one time during the war period, Mr. Kallal had a postal sub-station as a means of increasing store traffic, but this was abandoned some months ago due to the shortage of manpower.

Kallal offers an example of a progressive radio and appliance dealer who exercises considerable enterprise

and ingenuity in the face of changing conditions, so that a profitable business course can be charted and maintained. With his numerous contacts with

service customers, Mr. Kallal is in an excellent position to cash in on many sales opportunities in radios and appliances after the war.



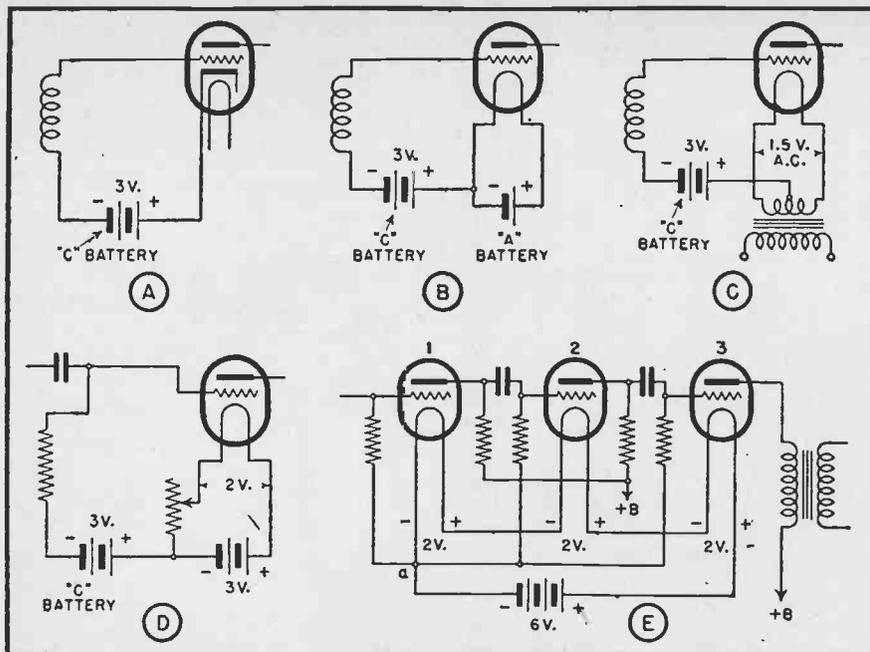


Figure 1

Grid Biasing METHODS

by JAMES PARKER

PART 2: Measurement of Bias Voltages

LAST article described various methods of applying bias voltages in modern radio receivers and mentioned that problems involved in measuring such voltages would be discussed later. Every standard voltmeter, even the electronic type, requires a certain amount of current for its operation, and this current must be drawn from the circuit under test. In low-resistance circuits, where the amount of current required to operate the standard high-resistance voltmeter is small in comparison with the total current in the circuit under test, this is no problem. As this is the case in most cathode, battery, and power-supply bias circuits, these present no difficulties with any standard voltmeter.

But when we encounter bias and other voltages in high-resistance cir-

cuits, such as those applied through resistance-capacity filters in grid, screen, and plate circuits, we have to make sure that the instruments used to measure these voltages either has far higher resistance than the circuit under test, or to make allowance for the error in reading caused by its load on the circuit being checked. Alternatively, we may find the voltage by indirect methods. In normal times, of course, we can buy an electronic voltmeter, or a 20,000 ohms-per-volt meter, and for all practical purposes, our worries will be over. But under present conditions, when such instruments are difficult or impossible to obtain, we've either got to "roll our own" or use some other dodge to serve the purpose.

Most technically-trained and experienced servicemen are familiar

with the difficulties experienced in measuring voltages in high-resistance circuits and automatically make allowances for errors in reading due to the load of the measuring instrument. For the benefit of newcomers to this field, we'd like to go over these troubles rather briefly, so as to clarify any points which might not otherwise be thoroughly understood.

With a 1,000 ohms-per-volt meter, the meter circuit resistance in ohms is equal to 1,000 times the full-scale value of the range used, in the case of a multimeter. Thus, on the 5-volt scale, the resistance is 5,000 ohms; the 100-volt scale, 100,000 ohms, etc. For a 20,000 ohms-per-volt meter, the resistance is just 20 times as great. Thus, for highest meter resistance, we need to use a meter with high ohms-per-volt rating and to use a high voltage range.

In the case of electronic voltmeters, a typical schematic diagram of which is shown in *Figure 1*, the meter is not directly in the circuit which connects to the apparatus to be measured. Instead, there is a voltage divider for various ranges which, in the diagram shown, totals 10 megohms. In addition, the connector with which this device is used has a 1-megohm resistor in its test prod which adds to the divider resistance, bringing the total input resistance to 11 megohms. This is constant on all ranges. In ohms-per-volt, the input resistance of 11 megohms for the 5-volt range amounts to 2,200,000 ohms per volt. But for the 500-volt range, this becomes only 22,000 ohms per volt. Thus the advantage of high ohms-per-volt sensitivity in electronic voltmeters applies mainly to low-voltage ranges where, fortunately, it is most needed. Standard voltmeters, while not having comparable sensitivity on low-voltage ranges, have the advantage of simplicity and convenience, in that no power supply is required, and the 20,000 ohms-per-volt type also meets efficient servicing requirements acceptably.

Now let's see how these instruments work out in practical applications. *Figure 2A* shows a typical triode resistance-coupled amplifier circuit. If we attempt to measure the grid voltage directly by connecting the voltmeter between grid and ground, as indicated in the dotted lines, we find that the grid voltage divides across the grid resistor, R_1 , and the resistance of the meter, R_m , as shown in *Figure 2B*. Using the 50-volt scale on a 20,000 ohms-per-volt meter, R_m becomes 1.0 megohm, and the voltage divides proportionately across R_1 and R_m . So the meter reads 2 volts, although the actual grid voltage, with the meter disconnected, is 3 volts.

While, from a technical standpoint, this seems to be a pretty big error, if we know what to expect and make

NOTE: The first part appeared in Oct. 1944 RADIO service DEALER.

allowances for it, we can put this limitation to good use. For example, by checking the voltage directly at the grid, as shown, and getting our reading of 2 volts, then measuring the voltage across the bias battery itself, which should be 3 volts, we have automatically checked the value of R_1 because we know it must be 0.5 megohm in order to reduce the meter reading by one-third.

With an electronic voltmeter having a resistance of 11 megohms, the reading of grid voltage under the conditions shown in *Figure 2A* would be 11/12 of 3 volts—about 2.75 volts, on any scale. And, of course, 0.25 volts higher across the battery.

Checking the plate voltage in the same manner, the resulting circuit with the meter connected is shown in *Figure 2C*. With a 20,000 ohms-per-volt meter on the 500-volt scale, its resistance is 10 megohms. This is so high in comparison with the .25 megohm plate load resistor that a close approximation to the actual voltage results. The meter reading will be 10/10.25 times 100 or about 97 volts. Approximately the same reading would be secured from an electronic voltmeter. With a 1,000 ohms-per-volt meter, using the 500-volt range, the reading would be about 67 volts, assuming, as we have in the previous illustrations that the voltage actually at the plate is 100 volts with the meter disconnected.

We've assumed, in these examples, that the plate current of the tube remains constant with and without the meter load. Actually, this is not entirely correct; it will increase slightly in a triode circuit, and this will tend to increase the accuracy of the meter reading. In the case of pentodes, the plate current does remain substantially constant with changes in plate load, so the figures will apply more exactly. From a practical standpoint, what with meter errors and the fact that plate circuit voltages aren't particularly critical anyhow, it really doesn't matter if there are small variations in readings; but grid voltages are more critical.

Some other practical factors enter into the picture. While the indicated voltages are theoretically more correct when a high voltage range is used to measure low voltages, the difficulty of reading low voltages on a high-voltage scale, plus the normal error existing in meters, which may be of the order of 1 scale division, plus or minus, may make the indicated reading less accurate on a high scale than it would be on a low scale. For example, using the original illustration of *Figure 2B*, a reading of 2 volts would correspond 2 scale divisions on a 50-volt scale—not much of a deflection. This reading is only guaranteed accurate to within 1 scale division, so it might be either 1 or 3 volts and still be within the normal range of meter accuracy.

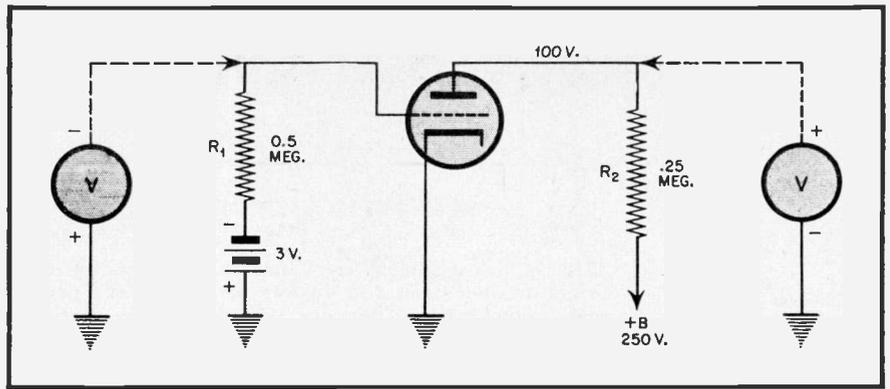


Figure 2-A

If, instead of using the 50-volt scale, we employed the 5-volt scale, the meter resistance would be 100,000 ohms instead of 1 megohm. The actual reading would then be 100,000/600,000 of 3, or 0.5 volt. This would correspond to a 5-division deflection on a 50-division scale, which would be readily readable, though less accurate. However, taking into consideration meter error, and making allowance for the effect of the meter load on the circuit, we would come out with a more practical and accurate reading than could be attained using the theoretically better high range. The fact that a greater scale deflection may be secured when using a lower range is valuable in checking AVC action, where the actual voltage is not as important as is the knowledge that the AVC is functioning.

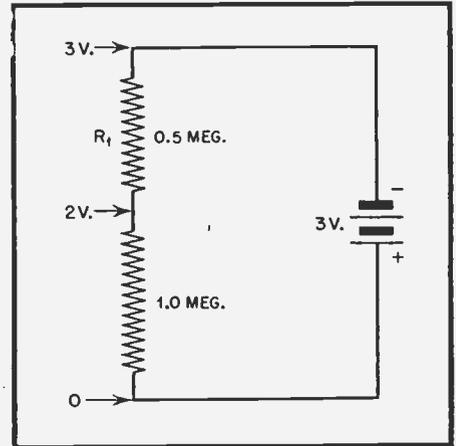


Figure 2-B

The electronic voltmeter is particularly useful in checking oscillator grid voltages. In connecting any other type of voltmeter across an oscillating circuit, the a-c as well as the d-c voltage is affected. In the circuit of *Figure 3*, for example, if we connect a meter directly across R_1 , oscillations will be reduced in strength so that the actual rectified voltage appearing across R_1 will be less than could be calculated from a simple consideration of the d-c loading effect of the meter. Usually, R_1 is of the order of 50,000 ohms—not too high a value to be seriously af-

[Continued on page 43]

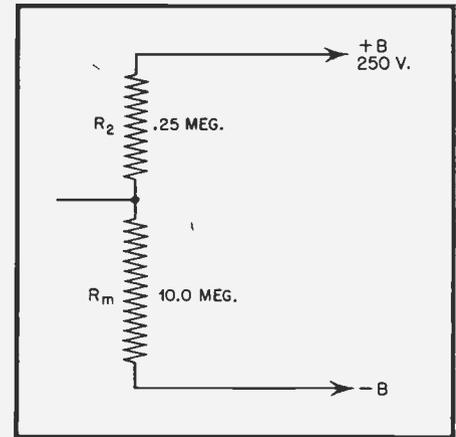
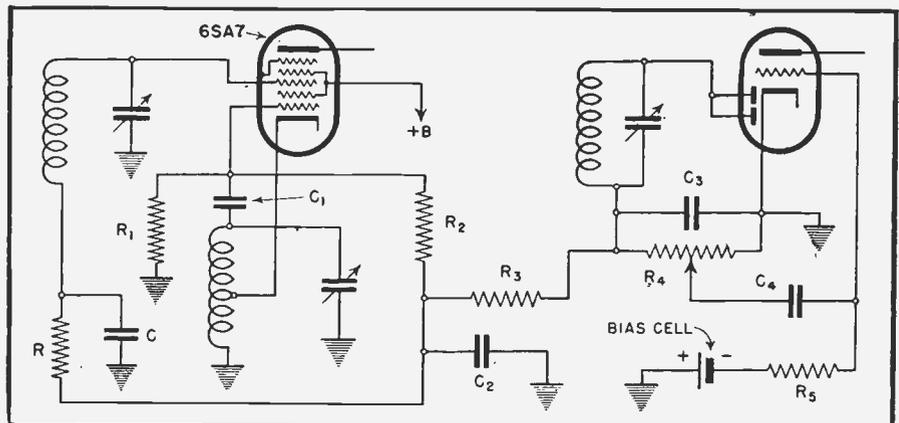


Figure 2-C

Figure 3



SUBSTITUTE TUBE CHARTS—PART 4

THE following charts are a part of a series which are being published to assist servicemen and dealers in meeting the present acute shortage of many tube types. They are intended to be more convenient, complete and reliable than most of those available but should not be followed blindly as many unusual circuits may be found which do not respond to any general treatment. There is still no substitute for experience in handling the tricky circuits.

The commonest changes are indicated by letters the meaning of which is explained in the chart headings and in greater detail in the footnotes. The number notes are to help when slightly more complicated changes may be necessary, or to indicate conditions under which it must be left to the serviceman's judgment as to whether the change will be satisfactory for his particular set, customer and location. (Footnotes are given below).

In general we have tried to list all the possible simple substitutions but experienced servicemen could work out others requiring more extensive modifications, such as changing from transformer to resistance coupled amplification in order to use a high-mu tube for an unobtainable low-mu type.

One of the biggest problems is finding a substitute which will fit mechanically into the space available. This must be found by trial for each job.

The whole series includes 150 ma. and 300 ma. tube types, battery tube types, and transformer and auto types. Please file this number of **RADIO SERVICE DEALER** for future reference. The introductory article explaining the circuit modifications requiring additional resistors appeared on page 18 of the November issue.

EXPLANATORY NOTES

- A. This is shown only when the tubes are directly interchangeable for all published ratings. Unusual operating conditions may require analysis.
 - B. This means that the filament voltage on the substitute tube is different from the required type. In most cases this can be allowed for by use of a small resistor to drop the voltage to that required. In some cases a complete change-over of all tubes so as to use a new supply may be advisable. No listing is made for 2.0 volt tubes replacing 1.4 volt tubes because the additional battery and best circuit changes must be determined for each case.
 - C. Indicates that the filament current of the substitute tube differs from that of the required type. If all tubes are used directly from the battery this will affect battery life only, but in many cases a series resistor or ballast may have to be changed, adjusted, or shunted. If in series on an AC-DC set a substitute with no change in current is required.
 - D. Uses the same socket but pin connection is different. Watch out for tie points not used in the former tube which may be used in the substitute tube.
 - E. Requires a different socket. Watch out for tie points as in "D".
 - F. Realignment is recommended as good practice in all cases of RF and IF tube changes.
 - G. Provision must be made for connection to the top cap of the substitute tube which was not originally required
 - H. The former top cap connection will have to be changed to connect to a base pin.
 - K. Indicates that the substitute tube operates at a different bias for the applied plate voltage than the original tube. If some of the newer types are substituted good performance and improved battery life can be obtained by reducing the plate voltage to the rating of the new tube and applying its rated bias.
 1. The use of a sharp cut-off RF pentode in place of a remote cut-off tube may cause great distortion in locations where strong signals are available. If no other substitute is available all tubes on the A. V. C. system should be changed.
 2. The optimum load resistance for these types is more than 20% off. If tone is noticeably poor, transformer tap adjustment or a new transformer may be required.
 3. Requires addition of screen voltage, resistor and bypass condenser. Select resistor to give screen volts approximately equal to the actual plate volts.
 4. This type can be used as a triode by tying screen and suppressor to the plate.
 5. This substitution usable only if tube is used as a single diode.
 6. If voltage at screen is greater than 45 volts it should be reduced to rated voltage.
 7. Screen voltage may be increased for use with this type.
 8. Circuit for this substitution is given on last few pages of this booklet.
 9. Unused elements should be tied to negative filament.
- * The G, GT, or GT/G types may be used interchangeably where space permits.

TUBE SUBSTITUTION CHARTS

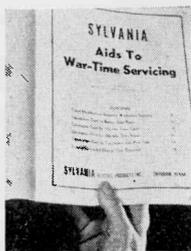
REPLACEMENTS FOR TRANSFORMER AND AUTO TUBES

REQUIRED TYPE	POSSIBLE REPLACEMENTS	REPLACEMENT METHODS										
		A	B	C	D	E	F	G	H	K	NOTE NUMBER	

REQUIRED TYPE	POSSIBLE REPLACEMENTS	REPLACEMENT METHODS										
		A	B	C	D	E	F	G	H	K	NOTE NUMBER	

7C5	6V6GT/G*				E						K	2
	6K6GT		C		E						K	2
	6F6G*		C		E						K	2
	6U6GT		C		E						K	2
	7B5		C		E						K	2
	41		C		E						K	2
	42		C		E						K	2
7N7	6N7G*		C		E						K	
	6F8G				E						K	
	6C8G		C		E		G				K	
	6SN7GT*				E						K	
12A	01A										K	
24A	57			C		E	F					
	35						F					
26	27		B	C		E	F					
	56		B	C		E	F					
35/51	24						F					1
	58			C			F					1
	57			C			F					
41	42			C							K	
	6K6G			C		E					K	2
	6F6G			C		E					K	2
	6U6GT			C		E					K	2
	6B5			C		E					K	2
	6N6G			C		E					K	2
	7A5			C		E					K	2
	7B5			C		E					K	8
	7C5			C		E					K	
	6V6GT			C		E					K	2
42	41			C							K	
	6K6G			C		E					K	
	6F6G			C		E					K	2
	6U6GT			C		E					K	2
	6B5			C		E					K	2
	6N6G			C		E					K	2
	7A5			C		E					K	8
	7B5			C		E					K	2
	7C5			C		E					K	2
	6V6GT			C		E					K	2
45	2A3			C							K	
	46			C		E					K	
	47			C		E					K	
	59			C		E					K	
46	47			C							K	
	59			C		E					K	
56	27			C							K	

57	58												K
	24A							C		E			
	35/51							C		E			
58	Same as 57. See Note 1.												
59	46							C		E			K
	47							C		E			K
	When used as Pentode							C		E			K
	45							C		E			K
	When used as Triode												
71A	182B												K
	183												K
	12A												K
80	5Y4G									E			
	5Y3GT/G*									E			
	5W4GT/G*							C		E			
	5Z4									E			
	5V4G									E			
	83							C					2
	83V												2
	5Z3							C					2
	5X4G							C		E			2
	5U4G							C		E			2
83	83V								A				
	5Z3								A				
	5X4G									E			
	5U4G									E			
84	6X5									C		E	
	6Y5									C		E	
	6Z5									C		E	
	6ZY5G									C		E	
	7Y4									C		E	8
89	41										D		K
	6K6G										E		K
182B/482B	183/483												K
	71A									C			K
	45									B		D	K
	46									B		D	K
	2A3									B		D	K
183/483	182B/482B												K
	12A									C			K
	45									B		D	K
	46									B		D	K
	2A3									B		D	K
485	27									B			K
	56									B			K



To help radio servicemen during wartime tube shortages, Tube Substitution Charts were published in RADIO service DEALER by special arrangement with Sylvania Electric Products Co., Inc., Emporium, Pa. The foregoing charts conclude the series, which ran in November and December, 1944 and January, 1945. The published material has now been issued separately in a 20-page manual by the manufacturer. For your free copy write direct or to the Service Editor, Radio Service Dealer.



"We give you

SERGEANT ADAMS!"



Little or no introduction is needed by the welcoming committee. The Sergeant has been through many hells.

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their jobs in American industry. They know from experience what American equipment can do. Many will have first-hand knowledge of the war job performed by Eastern-built equipment—not only earlier types of amplifiers related to sound systems but also the newer types of Eastern units related to wartime and industrial instruments. As civilians, these men are going to say, "If it's built by Eastern, it's okay!"

To aid the war effort, our engineers are available for consultation on any amplification or electronics problem. Eastern will continue to apply its resources to designing and manufacturing war equipment until the day of Victory. Meanwhile, on request, we will send you the next of a series of articles on peacetime sound and electronic equipment, prepared by our engineering staff. Ask for Brochure 3-C.

Buy MORE War Bonds



EASTERN AMPLIFIERS

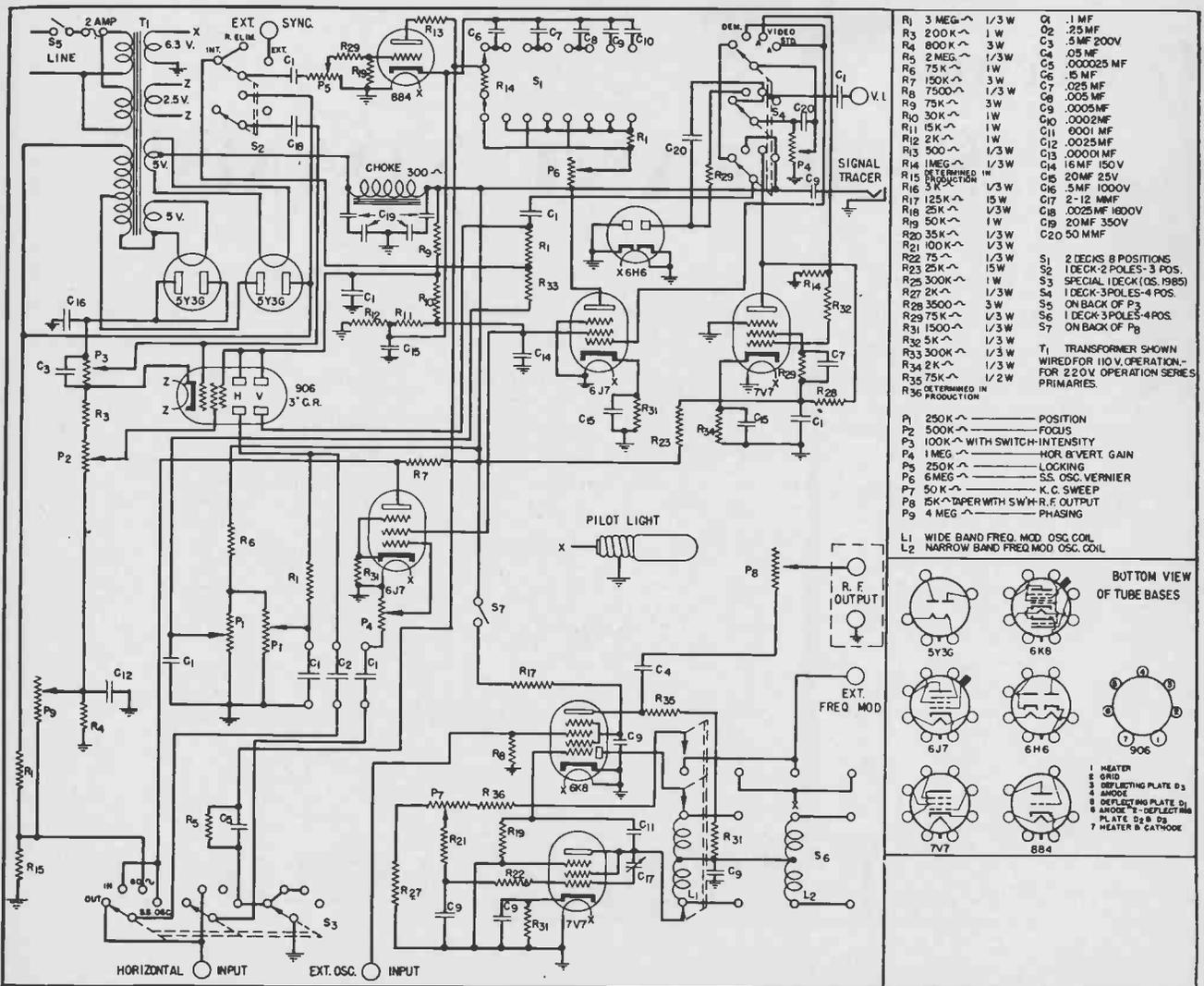
Eastern Amplifier Corporation • 794 East 140th Street • New York 54, N.Y.

Technical Service Portfolio

Section XLVII

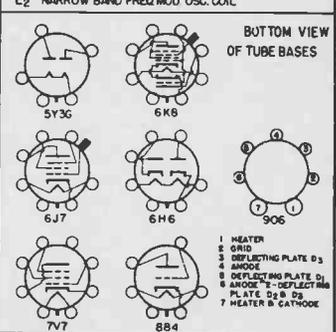
TEST EQUIPMENT CIRCUITS-Part 7

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.

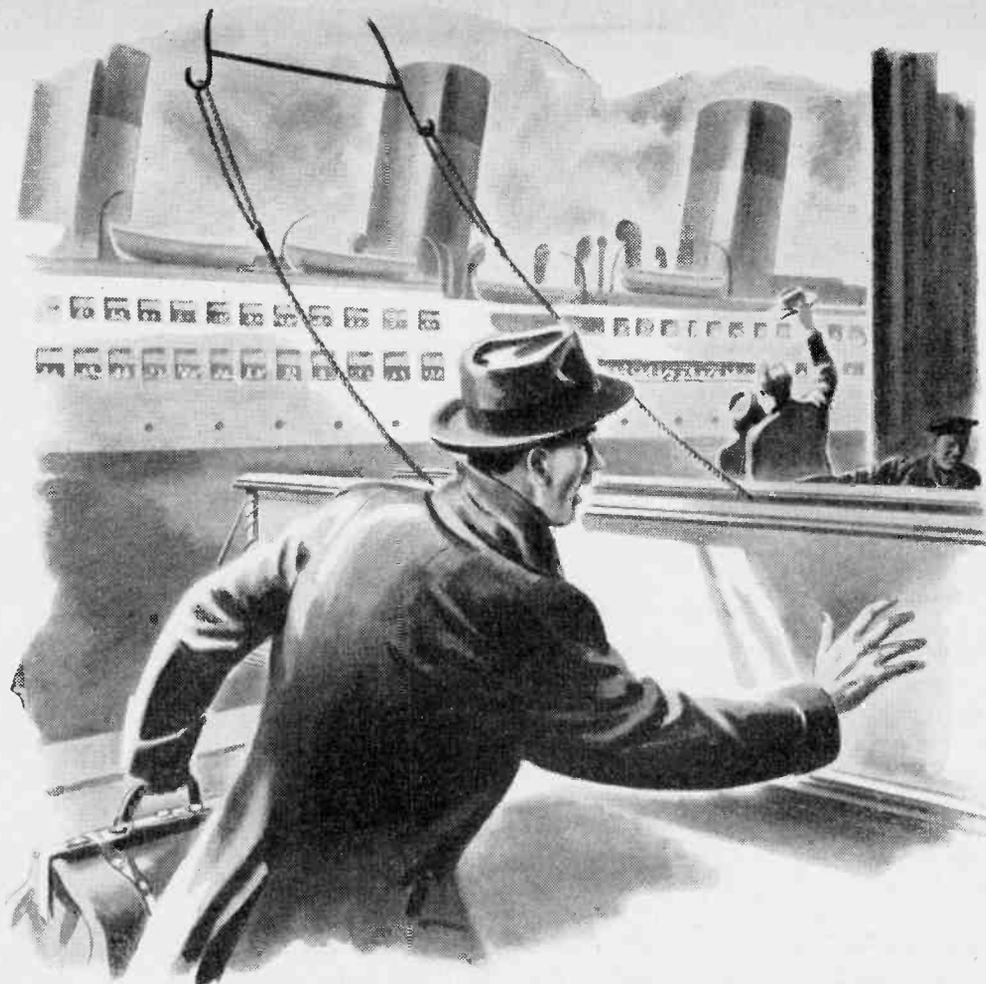


- | | | | | |
|-----|-------|-------|-----|---------------|
| R1 | 3 MEG | 1/3 W | C1 | .1 MF |
| R3 | 200K | 1 W | O2 | .25 MF |
| R4 | 800K | 3 W | C3 | .5 MF 200V |
| R5 | 2 MEG | 1/3 W | C4 | .05 MF |
| R6 | 75K | 1 W | C5 | .00025 MF |
| R7 | 150K | 3 W | C6 | .5 MF |
| R8 | 750K | 1/3 W | C7 | .025 MF |
| R9 | 75K | 3 W | C8 | .005 MF |
| R10 | 30K | 1 W | C9 | .0005 MF |
| R11 | 15K | 1 W | C10 | .002 MF |
| R12 | 2K | 1 W | C11 | .001 MF |
| R13 | 500 | 1/3 W | C12 | .0025 MF |
| R14 | 1 MEG | 1/3 W | C13 | .0001 MF |
| R15 | 500 | 1/3 W | C14 | 16 MF 150 V |
| R16 | 125K | 15 W | C15 | 20 MF 25 V |
| R17 | 25K | 15 W | C16 | .5 MF 1000V |
| R18 | 25K | 1/3 W | C17 | 2-12 MMF |
| R19 | 50K | 1 W | C18 | .0025 MF 160V |
| R20 | 35K | 1/3 W | C19 | 20 MF 350V |
| R21 | 100K | 1/3 W | C20 | 50 MMF |
| R22 | 75 | 1/3 W | | |
| R23 | 25K | 15 W | | |
| R24 | 300K | 1 W | | |
| R25 | 2K | 1/3 W | | |
| R26 | 3500 | 3 W | | |
| R27 | 75K | 1/3 W | | |
| R28 | 1500 | 1/3 W | | |
| R29 | 5K | 1/3 W | | |
| R30 | 300K | 1/3 W | | |
| R31 | 2K | 1/3 W | | |
| R32 | 75K | 1/2 W | | |
| R33 | 7V7 | | | |
| R34 | | | | |
| R35 | | | | |
| R36 | | | | |

- S1 2 DECKS 8 POSITIONS
 - S2 1 DECK-2 POLES-3 POS.
 - S3 SPECIAL 1 DECK (OS. 1985)
 - S4 1 DECK-3 POLES-4 POS.
 - S5 ON BACK OF P3
 - S6 1 DECK-3 POLES-4 POS.
 - S7 ON BACK OF P3
- T1 TRANSFORMER SHOWN WIRED FOR 110 V. OPERATIONAL FOR 220 V. OPERATION SERIES PRIMARIES.



Hickok Electrical Instru. Co. Oscillograph (Model RFO5)



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THE most talked of radio merchandising plan, *S.C.M.P. is available to *only one* dealer in a territory. To make sure you don't miss the boat—we suggest you get full particulars *now*.

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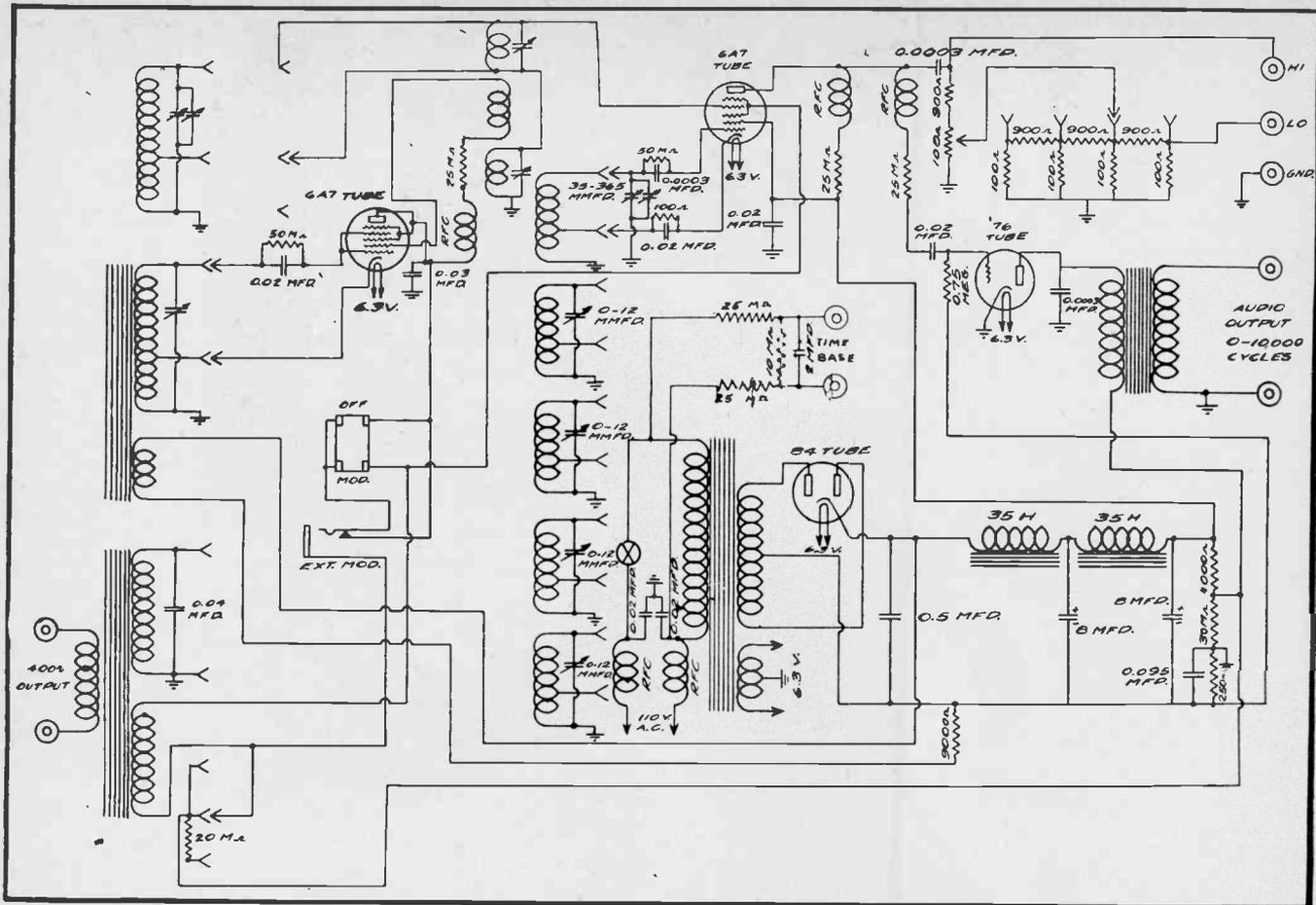
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Sparton Co-operative Merchandising Plan. An exclusive method of profitably retailing radios and home appliances that has been and is being advertised regularly to consumers in leading magazines as the Sparton Way.

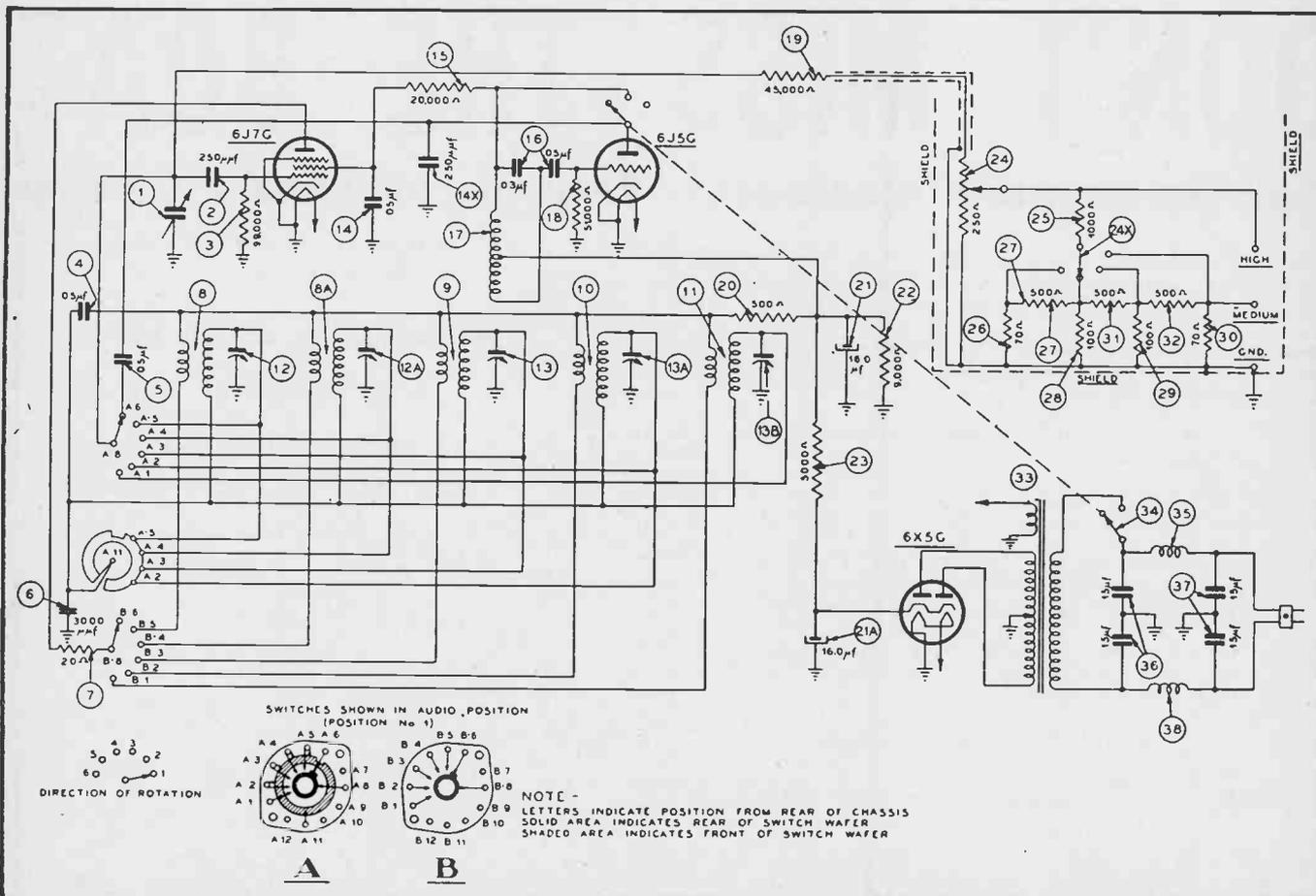
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Check These Profit-Increasing Features

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- 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

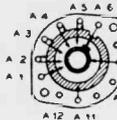


Supreme Instru. Corp. De Luxe Signal Generator (Model 580)

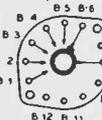


SWITCHES SHOWN IN AUDIO POSITION
(POSITION No 1)

3 4 3 2
6 0 1
DIRECTION OF ROTATION



A



B

NOTE -
LETTERS INDICATE POSITION FROM REAR OF CHASSIS
SOLID AREA INDICATES REAR OF SWITCH WAFER
SHADED AREA INDICATES FRONT OF SWITCH WAFER

Philco Signal Generator (Model 077)

ITEMS

Radiophoto Global Ads

A postwar program of global advertising which would utilize radiophoto transmission to flash copy and layout for simultaneous release to publications throughout the world has been announced by William J. Reilly, Advertising Manager of the International Department of the RCA Victor Division, Radio Corporation of America. Copy will be transmitted by Radiophoto to world capitals which are equipped with this type of communication. From these radiophoto centers, which are expected to be more numerous after the war, advertisements will travel by airmail to an additional network of far-flung cities, making possible the synchronized appearance of advertising copy in publications serving widely separated world markets.

The practicability of this program has been demonstrated by RCA Victor on two different occasions during the past year. The most recent use of radiophoto and transmission occurred during the observance of RCA's 25th Anniversary. By the combined use of radiophoto and rapid airmail delivery, the advertisement was made available to 12,500,000 persons in 47 countries in a matter of hours and days instead of the weeks and months ordinarily required for this type of coverage. Transmitted in English, the advertisement was translated at the point of receipt and appeared in a total of 274 newspapers and magazines published in 18 different languages and dialects: Afrikaans, Arabic, Dutch, English, French, Portuguese, Spanish, Swedish, Turkish and nine Hindu dialects. This successful use of the radiophoto method caps a twenty-year period of communications development. It was in 1924 that RCA first transmitted a photograph across the Atlantic by radio.

RCA's postwar plans include the international distribution of a selected line of household appliances in addition to the distribution of its own products to a worldwide market extending into 120 countries and territories which are covered by subsidiary companies and distributor agencies.

RCA's Tube AM

L. W. Teegarden, general manager, announces appointment of Howard Linn Edsall as advertising and sales promotion manager of the RCA Tube and Equipment Department.

HANDLE MORE JOBS IN A LOT LESS TIME!

THE GREATEST TIME SAVER IN SERVICING HISTORY ▼

Radio servicemen everywhere say that A. A. Ghirardi's **RADIO TROUBLESHOOTER'S HANDBOOK** (3rd Edition) helps them **TURN OUT TWICE AS MUCH WORK IN A GIVEN TIME!** Four times out of five, it tells exactly how to repair a set — *without any elaborate testing whatever!* Actually, this big 4-pound, 744-page manual-size Handbook is a complete guide to quick, easy repairs on **PRACTICALLY EVERY RADIO RECEIVER NOW IN USE.**

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The Only Complete Guide to Modern Professional RADIO SERVICE WORK

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Once in a blue moon a technical book is written that is so important, so complete, and so easy to understand that it is used and recommended universally by members of a profession! A. A. Ghirardi's **MODERN RADIO SERVICING** is that kind of a book — **AND MORE!**

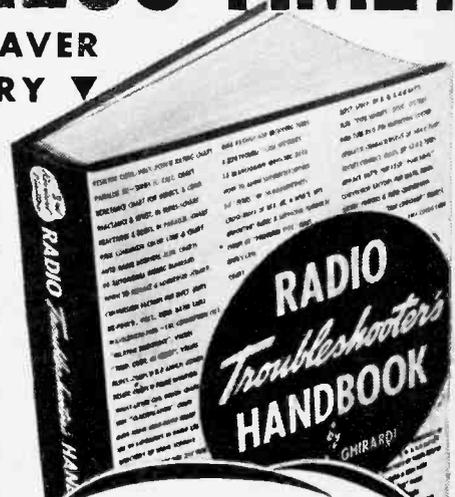
Actually, it is the only single, inexpensive book giving a complete course in modern Radio Repair work in all its branches. Explains all necessary test instruments . . . even how to build your own; how to troubleshoot **ALL** makes of receivers, analyze their circuits, test components; make adjustments; repairs, etc. — all step-by-step. Used for reference, it serves as a beautifully cross-indexed volume for "brushing up" on any type of work that may puzzle you. 1300 pages, 720 self-testing review questions, 706 illustrations and diagrams. \$5 complete (\$5.50 foreign) **5-DAY MONEY-BACK GUARANTEE.**

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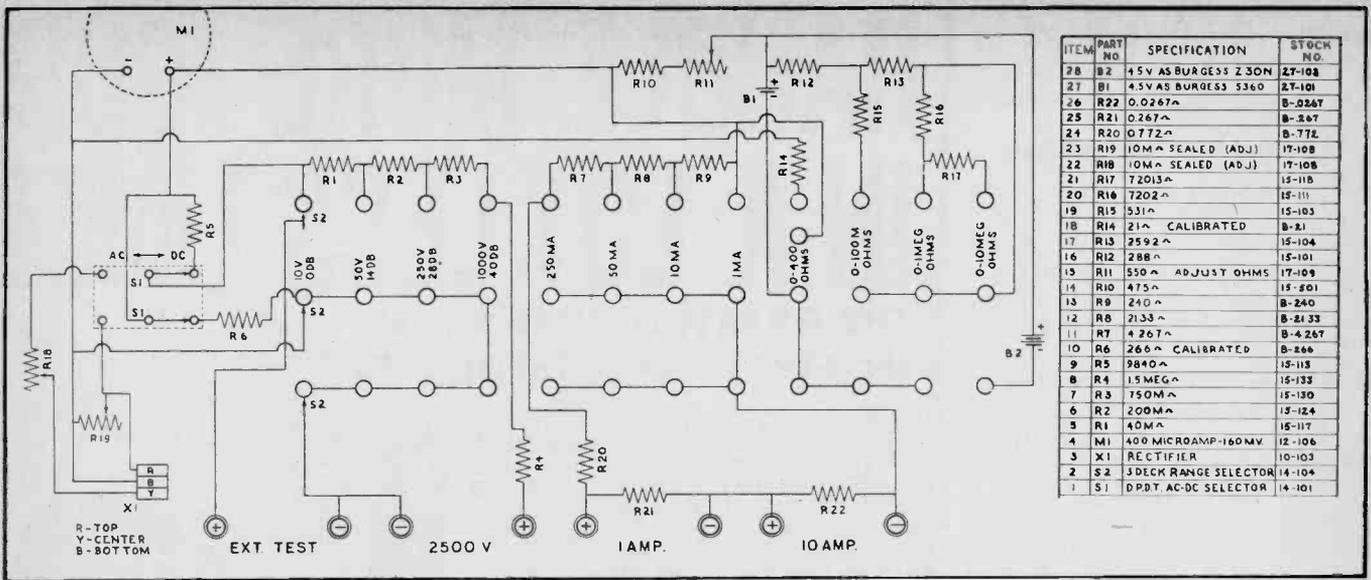
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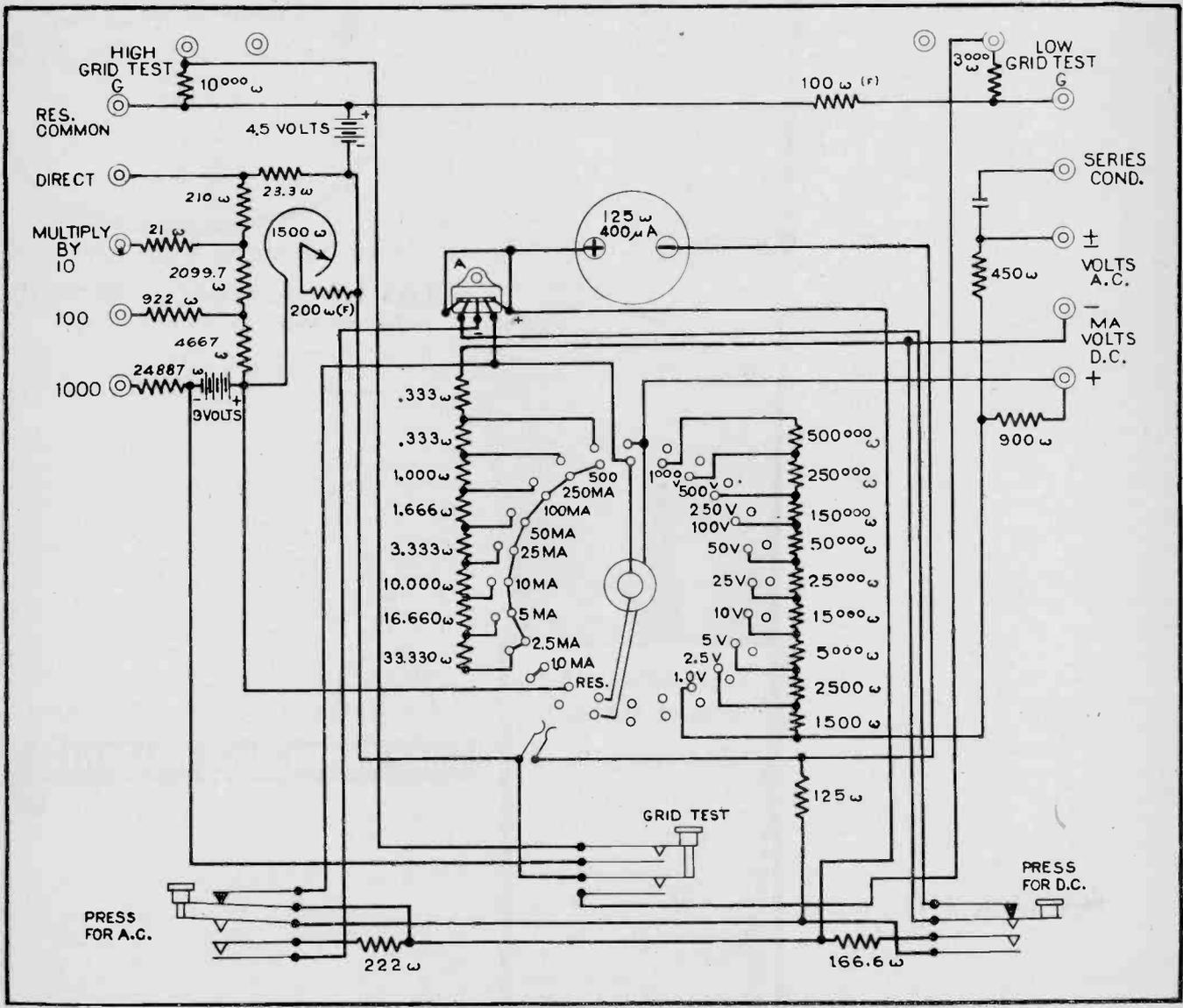
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17	R13	2592 Ω	15-104
16	R12	288 Ω	15-101
15	R11	550 Ω ADJUST OHMS	17-109
14	R10	475 Ω	15-201
13	R9	240 Ω	B-240
12	R8	2133 Ω	B-2133
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10	R6	266 Ω CALIBRATED	B-266
9	R5	3880 Ω	15-115
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7	R3	750M Ω	15-130
6	R2	200M Ω	15-124
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4	M1	400 MICROAMP-160MV	12-106
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Three Star Performance!

Note that the Sprague Army-Navy E Flag now contains **THREE** stars. These stars, coupled with the original flag presentation mean **FOUR** separate citations for outstanding service in supplying Sprague Capacitors and Koolohm Resistors to match the exacting demands of the nation's armed forces.

Such a fact explains better than words why it has sometimes been impossible to meet all civilian needs for these products. But it also shows beyond question of doubt that, whenever you can obtain them, you can rely on Sprague Capacitors and Koolohm Resistors for the utmost in service and dependability!

Ask for them by name. We'll appreciate it!

WILL TRADE two AC-DC portable radios in A-1 shape, one a 1940 Zenith, the other a 1941 Philco. Want late all-wave sig. generator or other servicing eqpt in good condition. All replies answered. Joseph Albright, 415 So. Main St., Tipton, Ind.

URGENTLY NEEDED — Multitester and good changer-recorder for use at military post. Have American Clipper DTT mike for trade or \$10 cash. Lt. E. J. Dobbie, Co. E, 1st Repl. Bn., PRD, Camp Beale, Calif.

WANTED — Tube tester, must be late model in A-1 condition. Michael W. Isaacs, Box 268, Lyndora, Pa.

WANTED — Dependable #1446-A AC-DC multitester; Radio City 309P tube tester; Triplett 696 battery tester; any plans for transceivers; "Moto" tool or any other hi-power grinder; 1504A Supreme tube and set tester. Richard Maher, 151B Helmick St., Norfolk 8, Va.

FOR SALE — Triplett vibrator tester 1670; Sprague Tel-Ohmike #16; Wright Decoster No-Koil multi-test speaker; first 5 vols. Official Radio Service Manuals; over 150 scarce tubes (ceiling price for those in cartons, 1/2 price for those not in cartons); assorted by-pass condensers, resistors, gang tuning condenser, volume controls etc.; new RCA capacity electronic control, etc. Edwin Larason, Martinsburg, Ohio.

WANTED — Echophone EC-1. Gilbert V. Fryant, Jr., Sp (W) 3c, USNR, Chaplain's Office, USNNTC, Sampson, N. Y.

FOR SALE OR EXCHANGE — Superior 1280 comb. tube checker & V-0-M, also an 016 Philco signal generator. Both for \$5 cash or will exchange for Webster-Audley automatic changer in good condition. William Lough, 20 Polhemus Place, Brooklyn 15, N. Y.

FOR IMMEDIATE SALE — Large quantity of tubes, 12SA7, 12SK7, 12SQ7, 50L6, 35L6, 32L7, 117L7 and 117P7, also phonograph motors. Write for list. Andrew Valentino, 57-1369 St., Maspeth, L. I., N. Y.

WILL TRADE Philco 070 signal generator, almost new, for tube tester to test latest types. Tester must be small or portable. Elwood Price, 1223 Virginia Ave., Bronx, New York 60, N. Y.

FOR SALE — Heater and fits all iron elements 85¢ each. Pacific Appliance Co., 2767 Mission St., San Francisco, Calif.

SELL OR TRADE — 0-50 AC milliamps meter; 0-150 AC voltmeter and following good used tubes: 1-1C5GTG; 1-6C6; 2-6F6; 1-6J5; 1-6L6; 1-6V6; 1-25B6; 1-80. Urgently need good sig. generator. Bill Wrocklage, 381 Main St., Hackensack, N. J.

WANTED — Late tube checker & set analyzer; also set Rider's manuals. Cash for good eqpt. Also want tubes and supplies. All letters answered. Larry's Studio, 106 S. Illinois St., Indianapolis 4, Ind.

WILL TRADE — Hallicrafters Sky Buddy, superb condition, new tubes, for RCP 802 or 803 VOM & tube test combination, or might consider a Superior 1280 and tubes. Have camera eqpt. to trade for Hickok 510X tube & set testers, Precision 920C or comparable instruments, or would take Superior channel analyzer and RCP 802 or 803 combination. Write for list. E. Rowell, 1640 Steiner Ave., Birmingham 7, Ala.

WANTED — Oscilloscope of any reliable make, any condition; Carroll signal tracer amplifier kit or coils #T143. Have for sale or trade: 2 generators 6v to 180v; Philco console farm-pack radio; some early tubes such as WD11 etc. Clifford D. Lessig, 24 Eighth St., Frenchtown, N. J.

WANTED — Tube tester in good condition, preferably for \$15 or less. Willie's Radio Service, 9710 Mt. Auburn, Cleveland 4, Ohio.

WANTED — Tube tester and signal generator, also Elder's manuals. Pfc. George W. Baker, M.A.A.F. Section C, Merced, Calif.

WANTED URGENTLY — 2-1R5; 1-1T4; 1-1S5; 1-1S4 tubes; 1-0.00041 mf. ganged tuning condenser; 2-456 Kc. IF; 1 osc. coil to handle broadcast band if 456 KC IF's are used. Cpl. Thomas M. McIlvain, 14162101, 384 F.S., 364 FG, APO 557, % Postmaster, New York, N. Y.

WANTED — 1" or 2" oscilloscope tube, white or green screen, new or used. Will exchange for early model Lafayette short wave receiver with coils for 160, 80, 49, 30 and 20 meters. Jacobus Experimental Co., 76 Mountain Ave., Maplewood, N. J.

WANTED — Hallicrafters HT-8 25-watt transmitter. Will pay cash or trade C.B. tube tester, signal generator, 2 multi-tubes, RCA voltohyst Jr., Bud 500-watt RF amplifier, power supplies and other transmitting eqpt. Only interested in HT-8 transmitter. Harry Pryssock, 919 W. Main, Toronto, Ohio.

WANTED — Speed key or bug for cash. I have A.C. instructograph; EC-3 receiver. What do you have to trade. Cpl. James Smith 34605219, 266-BW-Sec A.4, Majors Field, Greenville, Texas.

WILL TRADE — Jewel abridged galvanometer for phono motor and pick up or a tube tester. Anton P. Chapas, 1610 So. Sheridan Rd., No. Chicago, Ill.

FOR SALE — Hickok ohm-capacity instrument. Two 3 1/4 meters in one package, model 47. DC ohmmeter 1333 ohm, ranges 03, 0-30, 0-300, 0-600v. Will sell for \$65 or trade for critical tubes or small radios, or both. Meter has been used little. Emmett R. Wheeler, Union Springs, New York.

FOR SALE — Parts for assembly into powerful double push-pull concert amplifier with excellent tone qualities, incl. transformers, Weston milliammeter, chokes, filter condensers, etc. Write for list. Robert E. Lee, 337 Cuyler Ave., Trenton 9, N. J.

WANTED — Rider's manuals 5, 10, 11, 12 and 13. Have 2 new Philco portable radio cases complete with snap covers, leatherette trimmed, \$4 ea. or will trade. Harold Betz, 3362 N. Mascher St., Philadelphia 40, Pa.

FOR SALE — 6v 2-speed phono motor; 0-1 ma. and 0-15v AC meters; D.B. carbon mike; 955 tube. Write for list. Earl J. Huss, 414 Hildreth St., Charles City, Iowa.

FOR SALE — Complete radio shop equipment, including hard-to-get tubes and parts. A post card will bring you complete list. W. B. Paton, Box 595, Benavides, Texas.

FOR SALE OR TRADE — Triplett 1210A tube tester with charts, perfect operating condition. Price \$10, but prefer part or all payment in tubes such as 11A, 35v and 12v types. M. G. Dozier, 1208 College Ave., Tifton, Ga.

WANTED — RCA-Rider Sr. voltohyst in new condition with instructions. Paul Capito, 637 W. 21 St., Erie, Pa.

FOR SALE — 6Z5 tubes which will wire to replace almost any 5 or 6v rectifier in sets not exceeding 6 tubes. 10 for \$5.90. Adapter to use 6Z5 to replace 6X5 @ 75¢ ea. Henshaw Radio Co., 3313 Delevan, Kansas City 2, Kans.

WANTED — Automatic code practice machine and tapes, prefer Gardiner-Levering type 5. Also want code practice oscillator. Julius Katz, 39 Ramsey Pl., Albany 3, N. Y.

FOR SALE — 30-watt amplifier, one mike input, one phono input, one phono top with pickup & turntable, pickup for F-M, built-in radio, cathode ray & push button tuning, monitor speakers, etc., etc. \$90 plus postage. Walter Blount, 2672 Harrison St., Gary, Ind.

URGENTLY NEEDED — One 25B5 tube, glass or metal; also one 9" phono motor, light weight. Wally's Radio Shop, 158 Cleveland St., Manistee, Mich.

FOR SALE — Two new Worner 602 electric eyes, \$26.25 ea. Want an up-to-date std. make tube tester in perfect condition for one of the eyes. Eyes in original cartons. Roy C. Wilmarth, P. O. Box 368, La Mesa, Calif.

WILL TRADE FOR TUBES — Triplett 1210A tube tester; Supreme 89 deluxe tube tester and set analyzer (reads up to 20 meg.); Weston 772 VOM; Rider's manuals 3, 5, 6, 7, 10 and 14. Tubes in sealed cartons. Send offer. Heinz A. Tniele, 223 Main St., Hudson Falls, N. Y.

WANTED — Superior instruments #1130S; 1140S; 1180S and Superior dynamometer or other test eqpt. Cash. Complete Radio Service, 3023 Hilliger, Detroit 14, Mich.

WANTED — 3" or 5" scope, must have timing tube 834 or 885, but rest of scope need not be modern or in good condition. All inquiries answered. Grady Ellis, Rusk, Texas.

WANTED — Home made carrier current receiver & transmitter, for power line, phone or code. Have 25Z5's, 35Z5's, 12v, 50v tubes or cash. Morton Bardfield, 4 Brinsley St., Grove Hall 21, Dorchester, Mass.

WANTED — 12, 25, 35 and 50 volt tubes, also parts and equipment, new or used, but must be good. All letters answered. Interstate Radio Co., 1822 Lee-land Ave., Houston 3, Texas.

WANTED — Solar condenser checker, Rider manuals 6 to 13, also any 12, 35, or 50v tubes. Wilbur Watson, 417 E. Sutfenfeld St., Fort Wayne, Ind.

WILL TRADE scarce tubes such as 1LA6; 1LNS; 12SA7; 50L6 etc. for Thordarson transformer #15891—15A74 and 14C70. Eugene Kirseth, Box 247, St. James, Minn.

WANTED — Emerson AC-DC receivers using 12SA7; 12SK7; 12SQ7; 50L6; 35Z5 tubes. Cash or trade. Also want Majestic #250 5 tube AC-DC superhet, must be A-1. Cash. O'Brien, 164 W. 2nd St., Fulton, N. Y.

SEND US YOUR OWN AD TODAY!

For over two years now, the Sprague Trading Post has been helping radio men get the materials they need or dispose of radio materials they do not need. Literally thousands of transactions have been made through this service. Hundreds of servicemen have expressed their sincere appreciation of the help thus rendered.

Send your own ad to us today. Write **PLAINLY** — hold it to 40 words or less — confine it to radio materials. If acceptable, we'll gladly run it **FREE OF CHARGE** in the first available issue of one of the five radio magazines wherein this Trading Post appears every month.

HARRY KALKER, Sales Manager.

Dept. RSD-35, SPRAGUE PRODUCTS CO., North Adams, Mass.

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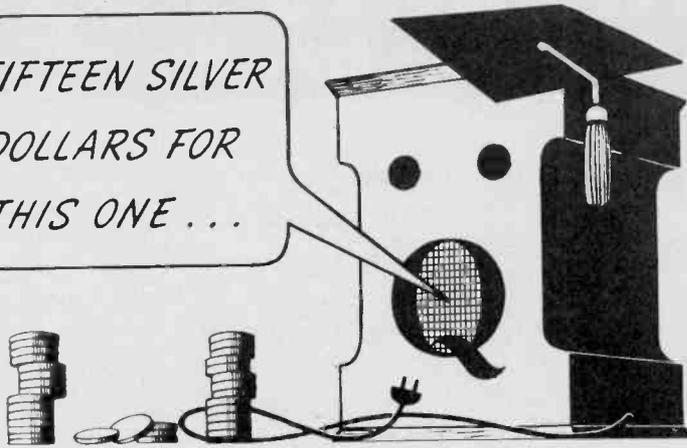
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Obviously, Sprague cannot assume any responsibility, or guarantee goods, services, etc., which might be exchanged through the above advertisements

RIDER VOLUME XIV COVERS 1941-42 RECEIVERS

In Trade
[from page 14]

FIFTEEN SILVER
DOLLARS FOR
THIS ONE ...



"Fifteen silver dollars for this one ..." were the first words I spoke as a new radio, four years ago. I don't remember the question, but I was thinking of those, my first words the other day when I noticed that that's the price of Rider's Abridged Manual Vols. I to V. It also occurred to me if the "Doctor" had asked "What's the best fifteen dollar investment a radio serviceman can make?" the answer would be easy.

That particular book gives the servicing data on the most widely sold sets issued between 1929 and 1935.

For sets of my age, made in 1941-42, there's Vol. XIV. This gives all the information you need to quickly diagnose and cure defects in we receivers issued during the last year and a half of civilian radio production.

If your jobber's out of a particular volume when you ask for it, please be patient. WPB paper limitations, y'know.



L. R. O'Brien

GE Tube Sales Managers

L. R. O'Brien and R. W. Metzner, former executives in the Ken-Rad Tube and Lamp Corporation, have been appointed sales managers in the Tube Division of the General Electric Company's Electronics Dept.

C. J. Hendon, Manager of Sales for the G. E. division, has announced Mr. O'Brien as Sales Manager of Equipment Tubes. In this capacity he will have charge of the sales of receiving tubes to equipment manufacturers, Mr. Hendon explains. Mr. Metzner has been made Sales Manager of Replacement Receiver Tubes. In their new positions, both men will have responsibility for the sales in their respective fields of both Ken-Rad and G-E brand tubes. (G. E. recently bought the Ken-Rad tube interests.) Mr. O'Brien will continue to have his headquarters in Chicago. Mr. Metzner will have his new headquarters in Schenectady, N. Y.



R. W. Metzner

RIDER MANUALS (14 VOLUMES)	
Volumes XIV to VII . . .	12.50 each volume
Volume VI	9.50
Abridged Manuals I to V (1 vol.)	15.00
Automatic Record Changers and Recorders	7.50
OTHER RIDER BOOKS YOU NEED	
The Cathode Ray Tube of Work Accepted authority on subject	4.00
Frequency Modulation Gives principles of FM radio	2.00
Servicing by Signal Tracing Basic Method of radio servicing	4.00
Servicing Superheterodynes	2.00
The Meter at Work An elementary text on meters	2.00
The Oscillator at Work How to use, test and repair	2.50
Vacuum Tube Voltmeters Both theory and practice	2.50
Automatic Frequency Control Systems —also automatic tuning systems	1.75
A-C Calculation Charts Two to five times as fast as slide rule	7.50
Hour-A-Day-with-Rider Series—	
On "Alternating Currents in Radio Receivers"—	
On "Resonance & Alignment"—	
On "Automatic Volume Control"—	
On "D-C Voltage Distribution"	1.25 each

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[Continued on page 38]



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.

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UNIVERSAL MICROPHONE COMPANY
INGLEWOOD, CALIFORNIA



In Trade

[from page 36]

Mallory's Dry Battery

Production to date has been confined to two important battery power supplies for portable U. S. Army and Navy radio equipment. These two battery packs have been built as replacements for the conventional type dry batteries originally specified by the U. S. Signal Corps. Compared with the battery which it replaces, the Mallory Tropical Dry Battery as now supplied to the Armed Forces, provides four to six times the operating life. The tropical dry cell has some noteworthy characteristics in addition to tremendously increased operating life. Its "shelf life" is equally outstanding. It will stand high temperatures which seriously impair conventional batteries. The individual cells are hermetically sealed.

The cells comprising the batteries have what is known as a "flat discharge" characteristic. Whereas the voltage in a conventional cell continuously drops throughout operating life of the cell, the voltage in the new cell within practical limits, remains substantially constant up to the end of

the cell life. This insures that equipment using the tropical dry battery as a source of power will operate efficiently during the entire life of the battery. Unlike conventional cells the new cell, within rated current range, possesses the same ampere hours' service life whether the battery is operated intermittently or continuously. Under normal conditions no recovery time is required.

It is still too early to hazard any fair appraisal of the peacetime significance of this development. At the moment, all effort is concentrated on increased production to meet expanding military requirements. Commercial exploitation is many months, perhaps years, away. It is believed that broad patent protection will be secured, although the issuance of any of many fundamental patent applications already filed is delayed by secrecy limitations.

Licenses already have been granted by the Mallory Company to the following companies: Ray-O-Vac, Magnavox Corporation and Sprague Electric Company. The question of further licenses will be met when a fair appraisal of the significance and breadth of this invention can be made. Suffice it to say that, in the peacetime future, the public will have adequate sources of supply at the lowest possible prices.



J. M. Lang

G. E. Ken-Rad Division Appoints

Carl J. Hollatz, division manager, announces appointment of J. M. Lang assistant manager of the Ken-Rad Division of the General Electric Company's Electronics Department. Mr. Lang, formerly accountant of the Tube Division, Schenectady, will have his new headquarters at the Ken-Rad Owensboro, Ky., plant. A native of Erie, Pa., and a graduate of the University of Michigan, Mr. Lang has been employed by General Electric in various responsible accounting capacities since 1928.

[Continued on page 40]



*Fine instruments
produced in volume*



*with quality first
to last.*

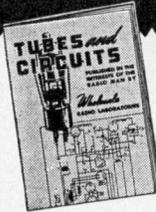
Triplet



ELECTRICAL INSTRUMENT CO.
BLUFFTON, OHIO

RADIO SERVICE DEALER

Send Only 10c For This Handy TUBE AND CIRCUIT REFERENCE BOOK

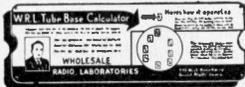


OUR NEWEST
GET-ACQUAINTED
OFFER!

Here's a handy reference book that meets the demand for simple, easy-to-understand data on substitution of radio tubes. Contains a special section technical information on

devoted to valuable tubes and circuits. It's a guide you'll refer to time and again. You can't afford to be without it. Send for your copy today! Only 10c postpaid.

**TUBE-BASE
CALCULATOR
ONLY 25c**



Here's just the calculator you've been looking for! Tells you quickly, tube characteristics that enable you to substitute available tubes for those hard to get. Send for one today. Only 25c. We pay the shipping expense.

**Giant Radio
Reference Map 15c**



Time zones, amateur zones, short wave stations and loads of other valuable information. Printed in colors; size 3½ x 4½ ft. It's yours free! Send 15c to help with packing and mailing.

**WE'VE GOT THOSE
HARD-TO-GET
RADIO PARTS**

You'll be surprised at the many hard-to-get parts we've been able to get for you fellows. Mikes, pickups, multi-testers, meters and many other items. They're yours as long as they last. Send today for our latest flyer. It's full of merchandise you've been trying to get! Stocks won't last long, so send today!



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- Send your reference book "Tubes and Circuits". Here's my 10c.
- You bet I want a Tube-Base Calculator. 25c is enclosed.
- Ship me your radio map. 15c is enclosed for packaging and mailing.
- Send your free flyer of hard-to-get radio parts.

Name.....

Address.....

Town..... State.....

I am an amateur; experimenter;
 service man.

In Trade

[from page 38]

Westinghouse Radio SM

Harold B. Donley, manager, radio division, Westinghouse Electric, announces appointment of Georges Faurie as manager advertising and sales promotion for the newly created division. Appointee has more than 17 years' experience in radio and appliance merchandising. Mr. Faurie leaves Delco Appliance Division of General Motors to take his new position.

P-A "Know-How"

Dr. Roy L. Anderson, engineer of the sound equipment division of Stromberg-Carlson Co., Rochester, N. Y., demonstrated the correct use of industrial music equipment in a course offered recently by the institute on music in industry, University of Minnesota. The three-day session was attended by operators of industrial music systems in an intensive survey of the new methods and techniques of music applications inaugurated in American industry since the first session held on the university campus

last summer. A. R. Holst, head of the university's center for continuation study stated that the course offers background subjects and theory together with a number of practical analyses and "how-to-do-it" demonstrations of music programs and p-a equipment. These features are studied in relationship to their effect in helping management combat worker fatigue, absenteeism and other personnel hold-backs on war production.

Firms Get "E" Awards

G. V. Rockey, executive vice-president, announces that Meissner Mfg. Co., Chicago and Mt. Carmel, Ill., has been granted a third renewal of the production award, adding a third star to the "E" flag at its Mt. Carmel plant.

W. J. Halligan, president, announces a fifth Army-Navy "E" award to Hallcrafters Co., Chicago. This means addition of a fourth star to the flag.

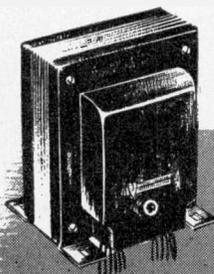
Wesley M. Angle, president, announces Stromberg-Carlson Co., Rochester, N. Y., was recently awarded Army-Navy "E" flag which now carries three stars.

P. S. Billings, president, announces winning of fifth Army-Navy award by Belmont Radio Corp., Chicago, Ill.,



After victory, Halldorson Transformers will be available in quantity. Now we are proud that our transformers are on the fighting front, doing the job where it's "Tough," helping to bring our boys home. However, we are producing a complete line of victory type transformers in limited quantity, but maintaining Halldorson's high standards. **JOBBERs**, write for complete information on our Halldorson Victory Type Transformers.

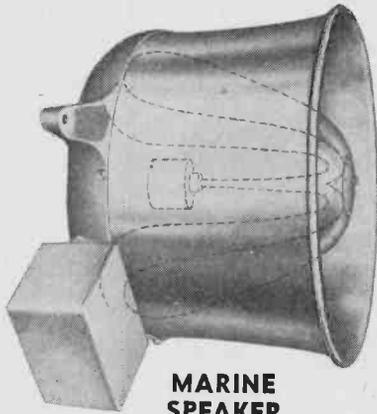
THE HALLDORSON COMPANY
4500 Ravenswood Avenue Chicago 40, Illinois



HALLDORSON
Vacuum Sealed
TRANSFORMERS



RACON



**MARINE
SPEAKER**

Above 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.



**RE-ENTRANT
TRUMPET**

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

P.-M. HORN

P.M. HORN UNITS are available in operating capacities of 5 to 50 watts.



THEY ALSO SERVE

On Naval vessels, transports, etc., — at airfields and training camps, — on Blimps, yes, on battle fronts — wherever entertainment or commands are distributed by public address equipment, you'll find the finest loudspeakers, RACON Products.

RACON serves the war effort on every front, from the crisp, dry, frigid Aleutians to the moisture-laden, humid South Pacific; . . . on the Eastern and Western Fronts that are smashing the Axis. No weather or atmospheric condition, heat, cold, wetness or

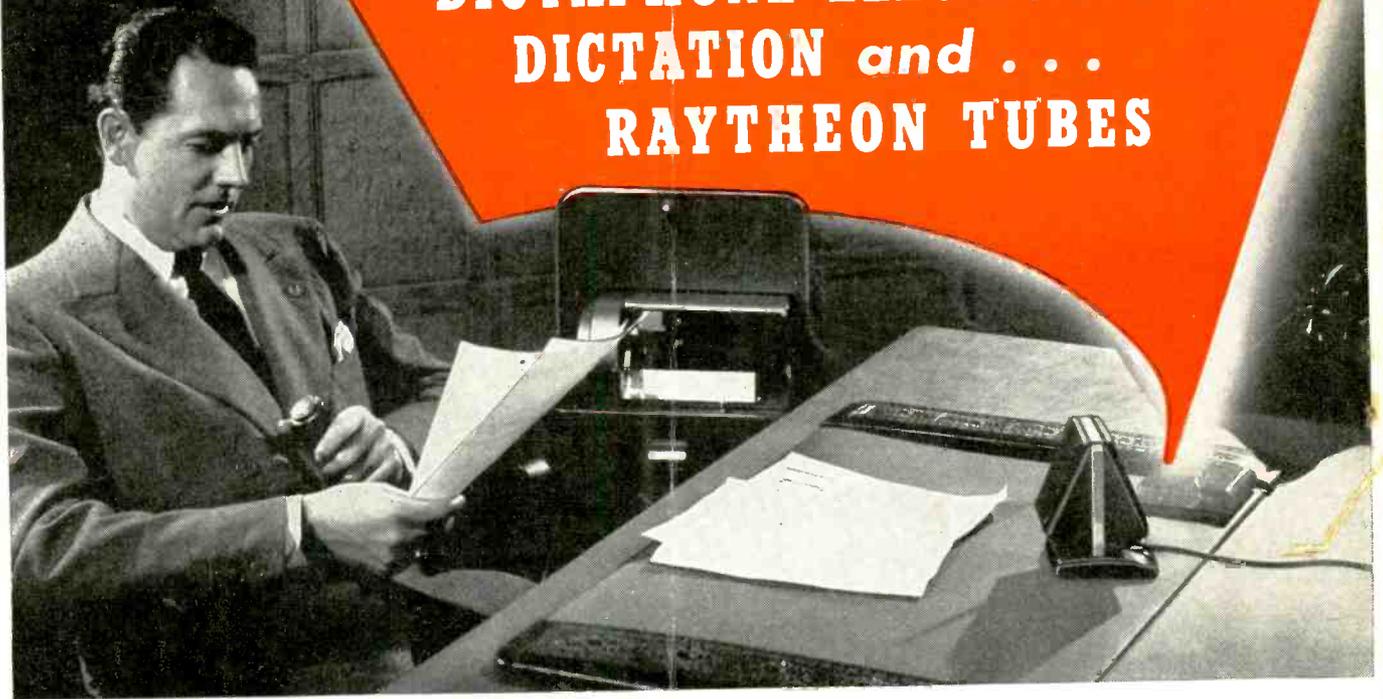
aridity affects RACON's efficient performance. Not even gun-fire, for RACONS are blast-proof. Designed right, made right, they work right.

When ship-yards or industrial war plants contemplate installing a P-A system, they want the best and most economical obtainable. RACON speakers and driving units are the answer. There's a RACON for every conceivable type of installation, so be sure to specify them.



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

DICTAPHONE ELECTRONIC DICTATION and . . . RAYTHEON TUBES



• If you're a radio serviceman or engineer, you'll appreciate the ingenuity and development work which produced this new Dictaphone Electronic Dictating Machine which is available for essential uses. And if you're a busy executive, as well, you'll praise it as an aid to getting things done more easily, more quickly and more conveniently. Not only does it record dictation, but over-the-desk conversations and both ends of phone-calls too!

Raytheon high-fidelity tubes used in this remarkable new machine consistently deliver clear, realistic reproduction and give long, dependable performance...just as they will in the future for this and an infinite variety of other electronic devices.

When peace comes, Raytheon tubes will be more readily available. And they'll be even finer than Raytheon's pre-war tubes,

for their design and construction will have been proved by the toughest test of all—the acid test of battlefront performance. We can promise, too, if you're a serviceman or dealer, that the Raytheon tube line will be the most *beneficial* line for you to handle. After Victory it will pay you to switch to Raytheon high-fidelity tubes!

Increased turnover and profits . . . easier stock control . . . better tubes at lower inventory cost . . . These are benefits you will enjoy after the war 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

Listen to
"MEET YOUR NAVY"
Every Saturday Night
ENTIRE BLUE NETWORK
Coast-to-Coast
181 Stations



RAYTHEON
High Fidelity
ELECTRONIC AND RADIO TUBES



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

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

"make it a
STROMBERG-CARLSON"

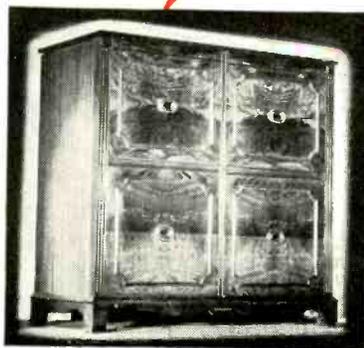


for the main radio
in your home

Many of our friends in the trade are telling us that our current advertising expresses soundly the basic superiorities of Stromberg-Carlson products. This idea that the *main radio* in a home should be as fine a radio as its purchaser can buy—a *Stromberg-Carlson*—is being carried to the public by over 475,000,000 impressions in thirteen leading national magazines.

Experienced radio merchants feel they can profitably tie their own post-war merchandising plans to this theme. For they rate Stromberg-Carlson as: the *important* radio line; the radio line that will make real *profits*; the radio line with assured and growing *public acceptance*.

You, too, will want to organize your own post-war selling program around this widely accepted Stromberg-Carlson sales theme. You'll find the Stromberg-Carlson "*main radio*" a profit maker—whether in an outstanding table model, console, or radio-phonograph combination. Write for the name and address of your distributor, who will be happy to supply additional information about Stromberg-Carlson.



STROMBERG-CARLSON

ROCHESTER 3, NEW YORK
RADIOS...TELEVISION...
TELEPHONES AND
SOUND EQUIPMENT



It's
SMART

to use our



**INSTRUMENT
REPAIR SERVICE**

Testing instruments, worth their weight in gold! Can't take chances . . . gotta get 'em serviced RIGHT! Here's where we shine . . . all makes repaired by experts!

BUT—Please, before shipping, let us know make, model and serial number, age of instrument, and what seems to be the trouble. Then we can steer you straight. . . .

AUTHORIZED SUPREME SERVICE STATION

**BURLINGAME
ASSOCIATES**
DEPARTMENT 45

11 Park Place New York 7, N. Y.

NATION-WIDE
MAIL ORDER
DISTRIBUTORS
SINCE 1928



**RADIO AND
ELECTRONIC
DEVICES**

For . . .

TRADE . . . INDUSTRY . . .
COMMUNICATION . . .
PUBLIC UTILITY . . .
VOCATIONAL AND
EXPERIMENTAL
APPLICATIONS

BURSTEIN-APPLEBEE CO.

1012-14 McGEE ST.
KANSAS CITY 6, MISSOURI

• **Ted McElroy**

World's Largest Manufacturer of
Wireless Telegraphic Apparatus
COMPLETE CENTRAL OFFICE EQUIPMENT

McElroy Manufacturing Corp.
82 Brookline Avenue • Boston, Massachusetts

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In Trade

[from page 46]

tensive postwar plans to apply wartime developments in high frequency communications engineering to the science of building improved FM receivers.



Norman J. Cooper

Stewart-Warner Appoints

Frank A. Hiter, senior vice-president and general sales manager, announces that Norman J. Cooper has been appointed service manager of the electrical products division of Stewart-Warner Corporation. Cooper has been employed in the household appliance or electrical division since his graduation from Illinois Institute of Technology, as an electrical engineer, in 1936.

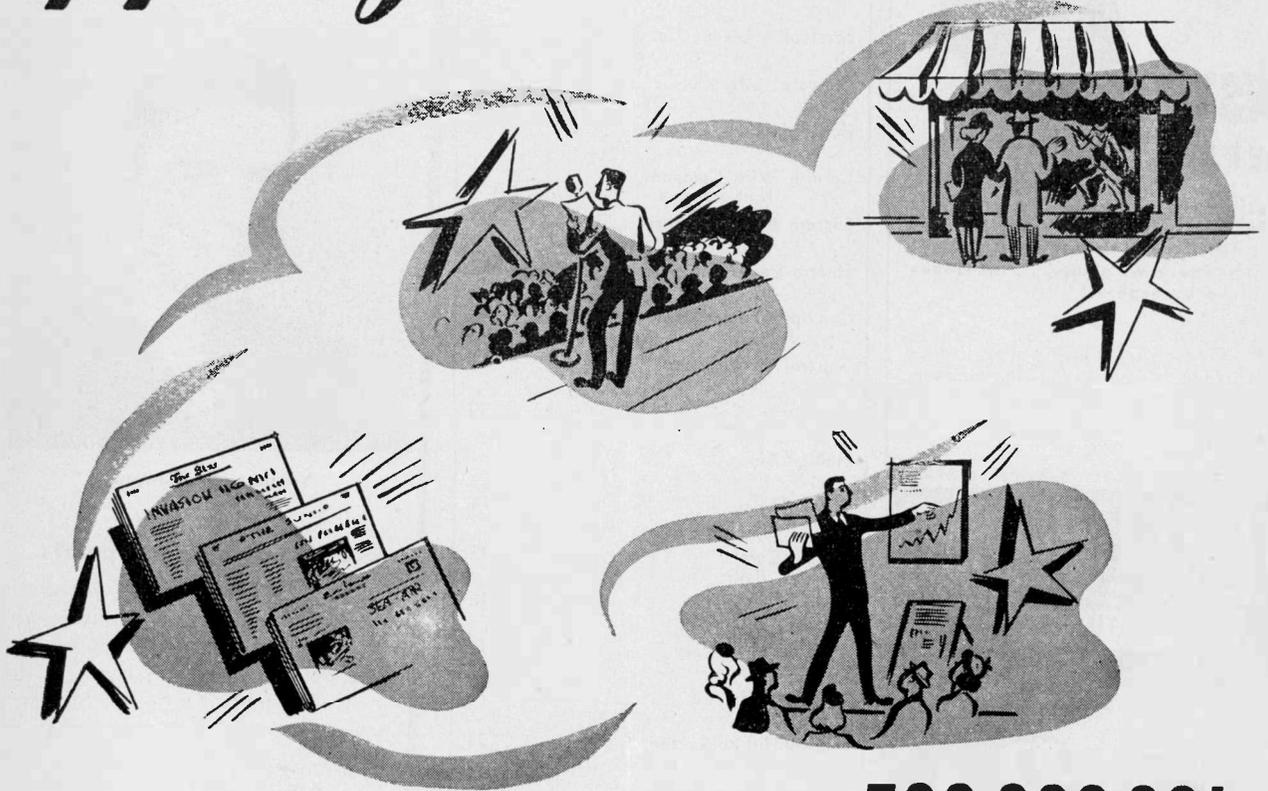


Lewis E. Dorfman

Belmont Represented

P. S. Billings, president, Belmont Radio Corporation, announces appointment of Lewis E. Dorfman as sales representative for the territory of New York City, New England and New Jersey. Mr. Dorfman has been active in radio sales since 1921.

Topping an \$883,000.00 Quota



by Over \$500,000.00!

An animated window display, 3 full pages of advertising, radio broadcasts, "total" employee-cooperation, stimulated by friendly competition and daily rallies, and storewide poster displays were among the methods used by a southern department store to sell \$1,481,875.00 in War Bonds—surpassing their 6th War Loan quota by well over half a million dollars!

American retailers may be equally proud of the \$25,000.00 in War Bond sales, made in the same drive by the 44 employees of a small city, eastern chain store. Also among thousands worthy of "honorable mention" are the several stores of a drug chain which in one month sold \$14,000.00 in War Bonds and Stamps!

Using the powerful ammunition of advertising space, bond-selling booths, and ingenious War Bond promotions, retailers from Maine to California are hastening the day of the victory parade and helping to block inflation.

Are you "out front" in this coast-to-coast effort to sell more bonds? Remember, the continued success of your business rests upon the future prosperity of your town or city—and this depends upon the postwar security of the families in your community. Families can have no greater protection than a sturdy bulwark of War Bonds. Help them, your community—and yourself—by advertising, displaying and **SELLING** War Bonds today, tomorrow and every day.

The Treasury Department acknowledges with appreciation the publication of this message by

RADIO SERVICE-DEALER

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

In Trade

[from page 44]

fronts, the War Production Board announces.

To stretch the available supply as far as possible and to assure that each "B" hearing aid battery sold is used to the full extent of its normal life, WPB urges each hearing aid user to buy only one "B" hearing aid battery at a time, as needed. Batteries kept in reserve deteriorate rapidly, and their life, when put to use, is shortened correspondingly.

An average of 13,000,000 cells for "B" hearing aid batteries were made and channeled through dealers to civilian aid users per quarter in 1944. This represents between seven and eight times the estimated rate of production of cells for assembly in "B" hearing aid batteries in 1940.

In the first quarter of 1945, WPB, in accordance with current policy concerning all civilian production, will not permit production of cells for "B" hearing aid batteries to exceed the total of 15,000,000 cells achieved in the fourth quarter of 1944, and production may be substantially less than in the fourth quarter.

FM Campaigns

A campaign "to stand Frequency Modulation on its own two good feet" has just been launched by the Stromberg-Carlson Company, one of the nation's largest peace-time manufacturers of radio, television and telephone equipment. The fifty-year-old company, a pioneer in the FM field, built thousands of pre-war FM receivers, in addition to establishing one of New York State's first FM stations, WHFM, in its home city of Rochester, N. Y.

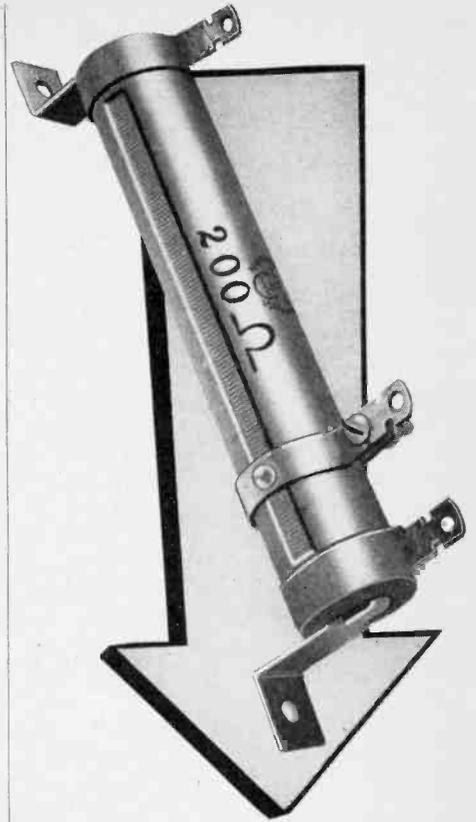
First step in the far-reaching program set in motion is the circulation of a pair of free booklets fittingly titled "FM—For You", and "Facts About FM". For easy distribution to the public, the booklets have been mounted on an attractive counter card now on its way to each of the company's distributors and their dealers throughout the nation.

With public interest in FM at an all-time high, and a total of 46 commercial FM stations already in operation, as of January 4, 1945, and applications for the postwar construction of 326 more filed to date with the Federal Communications Commission, radio industry leaders anticipate that the practically static-free broadcast medium will offer the greatest development and eclipse all others in the communications field in the immediate postwar period.

Said Dr. Ray H. Manson, vice president-general manager of Stromberg-Carlson, and a director of Frequency Modulation Broadcasters, Inc., and a committee member of the Radio Technical Planning Board, "The booklets, although written in the simplest layman's language, have not sacrificed an iota of technical or scientific accuracy. Every discovery and invention brought to the eyes of men has been ridden with the exaggerations, inadequate information and misconceptions in the minds of the public which have beset FM. If the booklets succeed in clearing the decks of only half these deviations-from-fact, they will have achieved a worthy purpose."

"FM—For You", in its fifteen pages, traces the history of the system of ultra-high fidelity radio reception discovered by Major Edwin Armstrong, noted American communications engineer, now a professor of electrical engineering at Columbia University. Bearing the official imprint of FMBI, the booklet, in quiz-and-answer form, goes behind the curtain to get the facts about FM, what it is, and how it ticks. "Facts About FM" deals with Stromberg-Carlson's ex-

[Continued on page 48]



For the TOUGHEST RESISTORS. ask for GREENOHMS

★ Those green-colored cement-coated Clarostat power resistors definitely "stay put". Brutes for punishment! Standard 10 and 20 watt fixed; 1-50,000 and 1-100,000 ohms, respectively. Standard adjustable, 25 to 200 watts; 1-100,000 ohms. Brackets. ★ Ask your jobber for GREENOHMS!



CLAROSTAT MFG. CO., Inc. · 285-7 N. 6th St., Brooklyn, N. Y.

RADIO Wholesale REPAIR

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
- OUR LOW PRICES mean more Markup for you.
- Prompt service

Send that set to

SHEFFIELD RADIO CO.

914 Belmont Ave.

Chicago 14, Ill.

RADIO SERVICE DEALER

Olson Radio Warehouse
REPAIR KIT
FOR RADIO CABINETS

Handy box with 9 shades of shellac sticks, light and dark stains, metal shading varnish, polish, Scratch Stick, alcohol lamp, alcohol, spatula, brushes, steel wool, sandpaper, felt, rubbing fluid, wiping cloth—everything you need to repair wood, plastic or bakelite cabinets, knobs, etc. A value!

\$2
POSTPAID

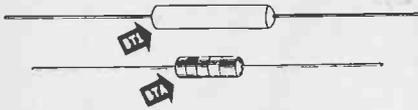
MAIL TODAY → **OLSON RADIO WAREHOUSE**
73-B Mill St., Akron, Ohio

Please send me... Repair Kits at \$2.00 each. I enclose check money order.

NAME

ADDRESS

TRADE PRODUCTS



Small Insulated Resistor

International Resistance Company announces a new BTA insulated 1-watt resistor, available for prompt delivery on priority orders. Designed particularly for applications requiring American War Standards' RC30 Specifications, the BTA also will fill a real need in a wide variety of limited space, low-power applications.

Characteristics of the new, small BTA compare favorably with those of the widely used Type BT-1, although the new unit is only 60% of the size of the B-1. Tests indicate that the 56° C. temperature rise of the BTA is lower than that of any other 1-watt insulated composition resistor of comparable size. The type BTA is 0.718" long by 0.250" in diameter. It has a wattage rating of 1-watt at 40° C. ambient and a voltage rating of 500-volts. Minimum range is 330 ohms. Standard maximum range is 20 meg-

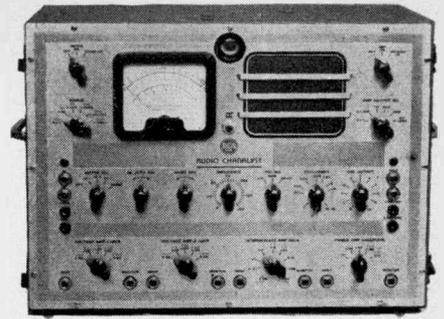
ohms. Higher ranges are available on special order.

Requests for technical bulletin on the BTA insulated resistor should be addressed to Department N22, International Resistance Company, 401 N. Broad Street, Philadelphia 8, Pa.

New RCA Audio Chanalyst

A new and advanced Audio Chanalyst, which provides complete sound system testing equipment in a single unit, is announced by RCA Victor Division, Radio Corporation of America. Known as RCA Type 170A, it is comprised of several self-contained testing sections or "channels" and can be used to test any point of any sound system from microphone to speaker, serving in emergencies as a bridging unit to substitute for the defective section of an inoperative amplifier.

The Audio Chanalyst contains a calibrated high gain amplifier useful for signal tracing, tube checking and gain measurements. It supplies its own test signal from a built-in Beat Frequency Oscillator, which can be operated by an internal auxiliary sweep



circuit for checking multiple speaker installations.

The VoltOhmyst is included as one of the channels and it has been modified for flat, linear measurement of audio frequencies. An impedance tester and a high-speed Electronic Indicator add to the unique testing facilities of the Audio Chanalyst, as various combinations of its channels can be used for audible and visual testing.

According to L. A. Goodwin, Jr., manager of RCA Victor's Test and Measuring Equipment section, the initial production of this Audio Chanalyst is being supplied largely to the Armed Forces for maintenance and testing of all types of intercommunicating and sound systems. Equipment available for civilian trade, he added, would be governed by priority ratings.

"RSD" Subscribers, ATTENTION

"RSD's" subscription lists are at the saturation point. New subscribers can be served only when an old subscriber fails to renew an expiring subscription. This condition will obtain until our paper quota is increased. Meanwhile, future issues of "RSD" will carry more pages of text than ever before.

"RSD" subscribers are notified one month before their subscriptions expire. By renewing about-to-expire subscriptions promptly old readers are sure to be served regularly and not miss issues. Subscribers who neglect to send a renewal order promptly will have their orders placed on the waiting list along with new subscribers becoming eligible for reinstatement when an opening occurs.

We are striving to take care of old friends first, after which it's a case of "first come — first served". Please cooperate. Answer expiration notices promptly or extend your present subscription now. Thank you.

LOOK AHEAD



Extend YOUR "RSD" Subscription NOW

A 1-year renewal subscription to RADIO SERVICE DEALER costs — \$2.00 — 2-year renewal subscription costs \$3.00. Canadian & Foreign Subscriptions are \$3.00 per year.

In Trade

[from page 41]

Balanced Tonal Range for Small Radios

A new idea and trade mark introduced itself into the radio industry with the announcement by Olympic Radio and Television, division of Hamilton Radio Corporation, New York, of the official registration of the trade-name "true-base", to identify its electronic system of balanced tonal range in table model post-war sets.

Nelson P. Case, director of research and development, describes the new "true-base" principle as follows:

Normally the human ear responds directly to a range of vibration frequencies which we call treble tones.

It does not respond in the same way to bass tones. The ear picks up the pure bass tone and then adds a series of harmonics of that tone, thus transmitting to the brain a composite chord, which the brain recognizes as that particular bass tone.

Always up to now, small receivers, which, in order to achieve compactness, necessarily had to forego large baffle areas and rely on small diameter speakers—cut the bass tones so that full reproduction was impossible. With the result that listeners were conscious of a definite hollowness in the bass range, without being able to identify what was lacking. So-called tone controls, which merely shut out part of the treble, in order to over-emphasize the bass, obviously only added another unreality to the first.

In the "true-base" system, an electronic (rather than an acoustic) method has been found, for creating within the electrical circuit itself, a full range of the harmonic series that enables the ear to reproduce the rounded depth and richness to what we call "bass notes". Thus, even a moderately priced table set may deliver true balance over the entire auditory range—heretofore possible only in larger console models.

Olson Service Organized

The Olson Radio Warehouse of Akron, Ohio, has perfected a streamlined system of service, to fill and ship

orders within 24 hours after receipt. It is the policy of this firm, which has been in the radio supply business for more than ten years, to advertise only what is immediately on hand. Monthly bulletins are issued to radio servicemen, listing the Olson items available for prompt delivery.

The modern five-story building to which the company moved last June is centrally located at 73 Mill St. in Akron, close to the railway station and post office, to facilitate rapid handling of orders. Olson features such nationally known lines as Mallory, Sprague, Aerovox, Utah, Meissner, R. C. A., and Raytheon.

Three brothers joined to build up the Olson Warehouse service. Philip I. Olson is now in the Army Signal Corps. Irving J. and Sidney L. Olson are now running the business.

Silex AM

Robert L. Stephenson, formerly with Sweet's Catalogue Service, has joined The Silex Company of Hartford, Conn., as Advertising Manager. In this capacity Mr. Stephenson will have complete charge of Advertising and Sales Promotion Activities. Mr. Stephenson previously handled merchandising and research for The New York Daily News, was in the advertising department of The New York Times and of Time Magazine; and was a member of the firm of Holens & Stephenson, publishers' representative.

RCA Tube Parts SM

L. W. Teegarden, general manager of the Tube & Equipment Department of RCA Victor Division, Radio Corporation of America announces that Charles W. Taylor, development and manufacturing engineer with fifteen years of diversified activity in the electronic field, has been named manager of tube parts and machinery sales. Mr. Taylor will be located at the company's Harrison, N. J. electron tube manufacturing plant where he will work under the direction of L. S. Thees, Manager of RCA's equipment tube section.

Hearing Aid Batteries

Production of "B" hearing aid batteries, although maintained at a much higher level than before the war, cannot at all times keep pace with the demand of the growing number of persons using hearing aid instruments, since manufacture of the "B" hearing aid batteries cannot be allowed to interfere with the delivery of dry cell batteries urgently needed on the battle-

[Continued on page 46]

RADIO TUBES FOR SALE IN5

(1L4 with adapter to replace IN5, complete unit \$1.25 ea. (sold on a money-back guarantee)

6SH7 @ .59 ea.

6SN759 ea.

7H750 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.

SPEED UP REPAIRS WITH THESE G-C AIDS!



FREE
STEEL
CABINET

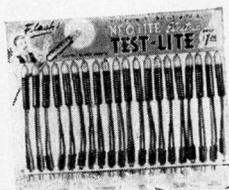
G-C Dial Belt Kits

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



Grid Biasing

[from page 25]

ected by the connection of a high-resistance d-c meter, if we consider solely the effect of the d-c load. But the detuning effect of the voltmeter leads, which are bound to affect any oscillating circuit, become important. One way out is to cut a milliammeter in series with $R1$ and ground, read the rectified current in milliamperes and multiply by the value of $R1$ in ohms, thus securing the d-c voltage across $R1$.

A simpler method is to use a 1 megohm isolating resistor in the test prod of the voltmeter, close to the point. This can be done with a standard 20,000 ohms-per-volt meter as well as with the electronic voltmeter, with which it is standard. We merely have to make allowance for the reduction in voltage due to the use of the isolating resistor. This scheme may, of course, be used in any circuit where r-f voltages are present which must not be affected when measuring the d-c voltage.

The practical need for checking oscillator grid voltage is not so much the actual voltage, which is not particularly critical, and which may vary considerably in different circuits, but to see if the oscillator is functioning. If it is, then a rectified voltage will appear across the oscillator grid leak. Sometimes the oscillator goes "dead" over a portion of the tuning range; this may be readily revealed by connecting the voltmeter across, or the milliammeter in series, with the oscillator grid leak and watching for the point where the voltage drops out.

Another advantage of this check is to determine uniformity of oscillation. Occasionally the oscillator voltage becomes so weak that the sensitivity of the received is reduced; a change in oscillator voltage of more than 3 to 1 over the tuning range of one band calls for further investigation. Possible causes are a defective tube, moisture absorption in oscillator coil, and corrosion in oscillator circuit connections, particularly from coil to ground.

A very simple device for checking voltages, either a-c or d-c, in high resistance circuits is shown in Figure 4. A test prod with a series resistor of 1 or more megohms may be used in series with the d-c lead which will add to that of the 2-megohm potentiometer to give a higher input resistance. The potentiometer is calibrated by applying known input voltages across the input and adjusting the moving arm until the 6E5 eye just closes. If an isolating resistor is used, as suggested, the calibration should be made with it in the circuit. An a-c power supply, ungrounded, should be employed.

AMCON

AN AMERICAN SOLUTION TO
YOUR CAPACITOR PROBLEMS

ALL TYPES - BY-PASS
AND ELECTROLYTIC

DATA SHEETS
ON REQUEST

AMERICAN CONDENSER CO.
4410 No. Ravenswood Ave. • Chicago 40, Ill.

UNIMETER

This unit fulfills an extremely important need for general utility portable service equipment. It has wide range coverage for both a-c and d-c measurements of voltage, current measurements on d-c and the popular ranges on resistance.

The UM-3 is designed to clearly indicate all the functions which aid in the prevention of application of high voltages when preparing for current or resistance measurements.

Other G-E units for better servicing include: Tube Checker TC-3, Unimeter UM-4, and Oscilloscope CRO-3A.

For details write: *Electronics Department, General Electric, Schenectady 5, New York.*

Electronic Measuring Instruments

UM-3 GENERAL ELECTRIC

177-D2

Write up any "kinks" or "tricks-of-the-trade" in radio servicing that you have discovered. We will pay \$1 in Defense 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.

\$1.00 PAID FOR SHOP NOTES

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

INDIVIDUALLY TESTED



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.

● Ask Our Jobber . . .

● 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".



