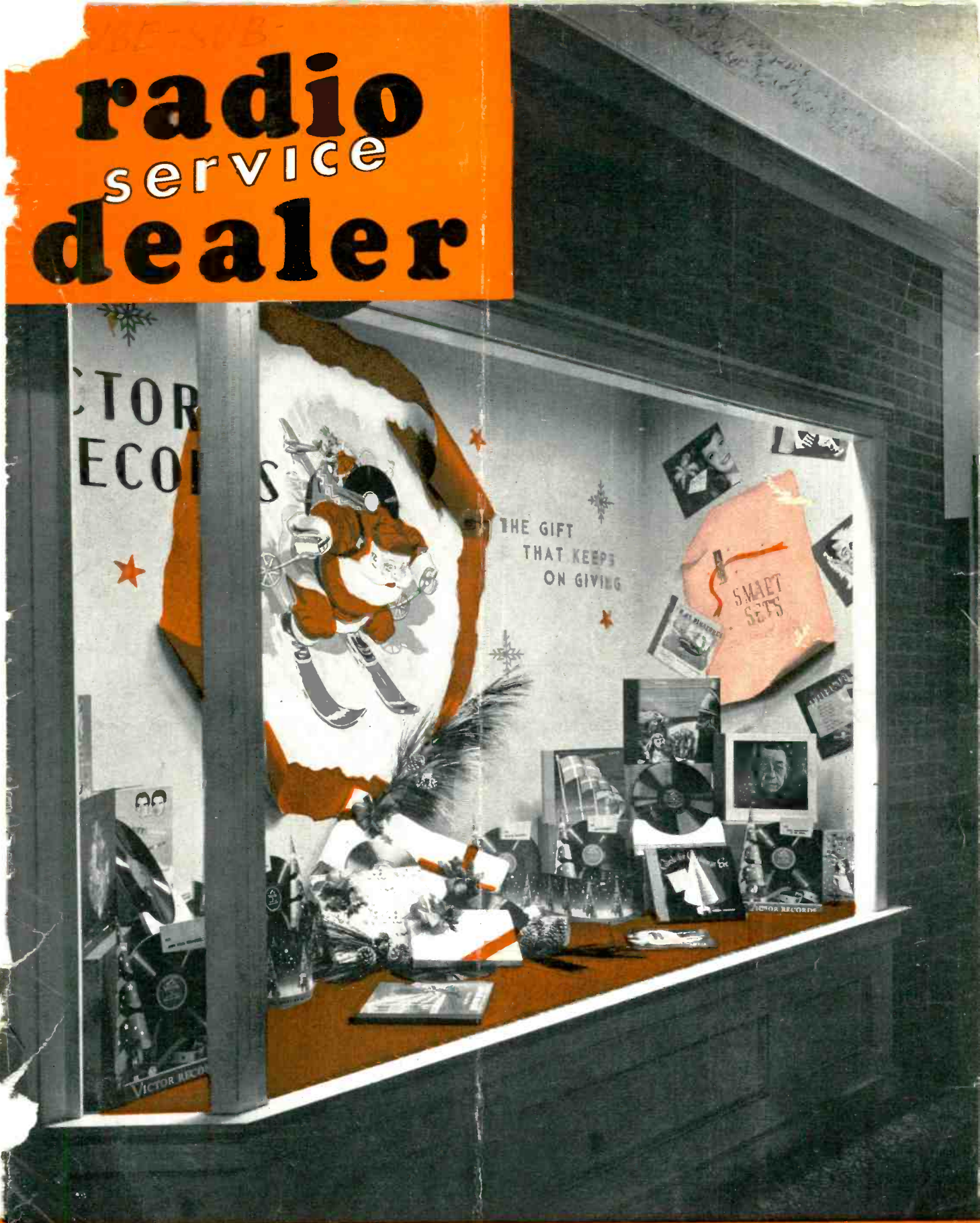
radio service dealer



HOLIDAY MERCHANDISING NUMBER

In This Issue:

Hard Selling Will Get the Business

The Boom in Records - Market for Radio-Combinations

EXCLUSIVE FEATURE:
TUBE SUBSTITUTION CHARTS

November, 1944

25c

A Good Way To Avoid Complications...

STANDARDIZE on MALLORY Replacement Parts

★

NO MATTER how carefully you do your work, the failure of an unknown replacement part will bring the customer storming back to your shop. Mallory approved Precision replacement parts will help you to avoid this loss of time, money and good will.

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MYE TECHNICAL MANUAL —108 pages of complete data on capacitors, noise suppression, receiving tubes, loud speakers, vibrators, phono-radios, automatic tuning and other valuable information. Available from your Mallory distributor...Price, $2.00.

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ARMY E NAVY

Don't Forget—Government War Bonds

radio service dealer

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

VOLUME 5, NUMBER 11
NOVEMBER - 1944

CONTENTS

SANFORD R. COWAN....*Editor & Publisher* LEWIS C. STONE.....*Managing Editor*
CHARLES H. FARRELL .*Advertising Manager* SYLVIA BORNKOFF.....*Circulation*

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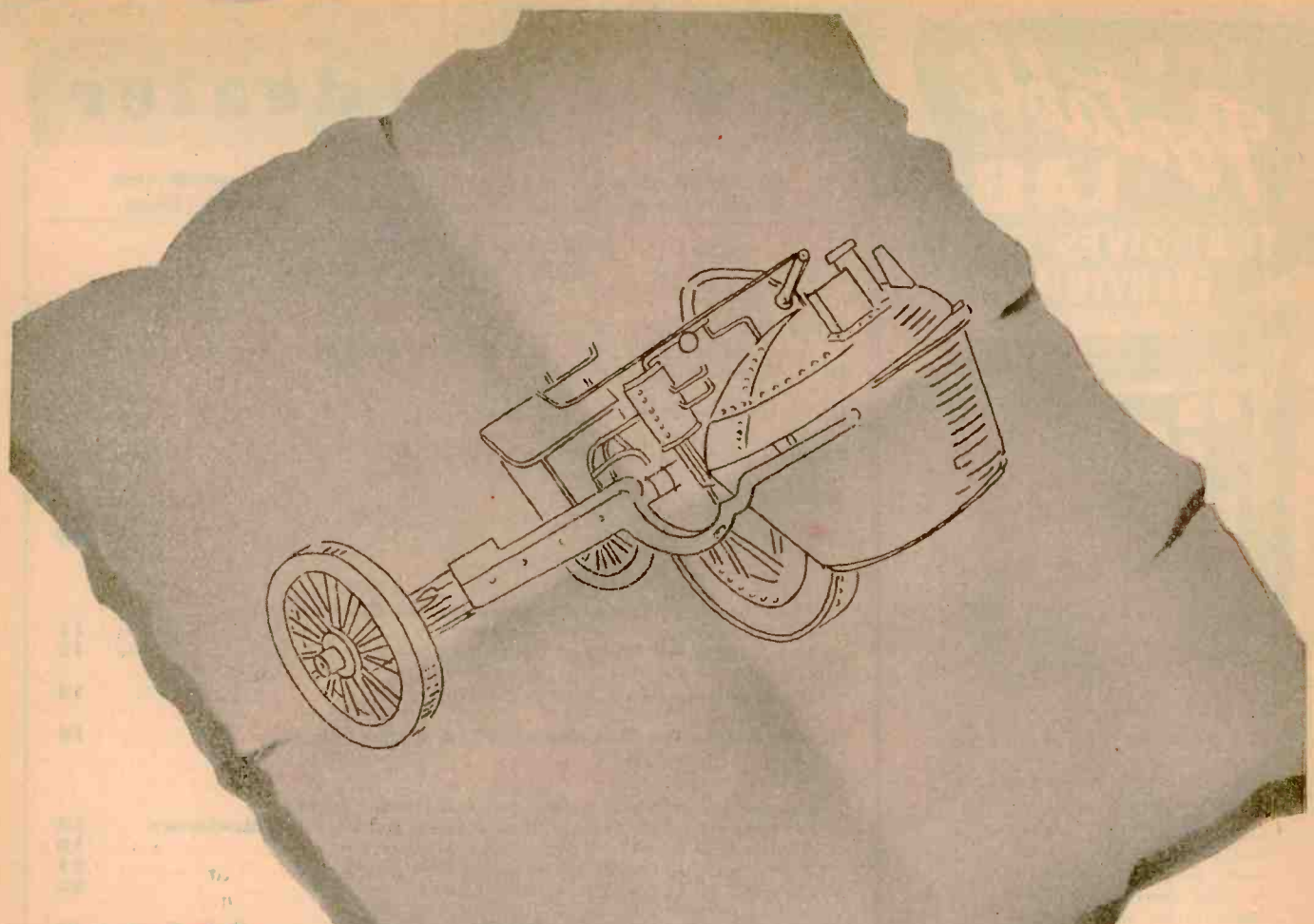


Experience Counts

That machine above was built by Nicholas Cugnot in 1769. It is the great, great, great grandfather of the modern automobile. Cugnot's machine was the original Stanley Steamer. It had a boiler in front and when it ran it might go as fast as 2½ m.p.h. That machine was a far cry from our modern car, but it was a fine idea. The reason it was not more successful was that Cugnot simply did not have enough experience.

In the manufacture of all products, Experience Counts.

The WARD PRODUCTS CORPORATION has long been a leader in the design and manufacture of antennas for automobiles and home radios. Many important design changes, pioneered by WARD, have become accepted standards in industry. WARD products are quality products, reflecting the workmanship of craftsmen using modern equipment. . . . For the finest antennas for all automobile and home applications, look to WARD!

BUY WAR BONDS

WARD Antennas

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

with the editor.....

Industry Conference

ELSEWHERE in this issue is a concise report of the October 19-21 Electronic Parts & Equipment Industry Conference. Highlight of the meeting was the announcement that a new committee, the Radio Parts Industry Co-ordinating Committee, has been formed —object: to solve the problems of parts manufacturers and distributors. We surmise the Committee will try to work out a proper plan whereby an allotment of replacement parts will be made available to distributors on V-Day rather than have all parts go to manufacturers who'll be demanding all they can get without reservation for new equipment production.

Time To Collaborate

THE National Electronic Distributors Ass'n, Inc. was established in 1939 "to advance the interests of and promote cooperation among its members." The N E D A 's Constitution reads, "Membership in the Association shall be limited to wholesale distributors of electronic equipment and replacement parts." No mention is made that retailers or service organizations are eligible.

Obviously a distributor who sells at retail or who does service work for the general public does not qualify for NEDA membership if the Constitution of that Association is strictly abided by. In past the officers of NEDA found it expedient not to censure or expel members who did retail selling or service work. Now NEDA has a new President. We urge him and his associates to give some thought to this subject. Thousands of service dealers now feel, and rightly so, that their distributors are in outright competition with them. This is an untenable condition.

Our industry would benefit from an organization like NEDA if most distributors were members and if all its members lived in accord with its Bylaws and Constitution. It can and should be accomplished. Harmony between distributors and their service dealer customers will be achieved when distributors stay on their side of the fence. 85% of the country's leading service dealer establishments subscribe to this publication and to the views expressed by this editorial. It's time to collaborate.

News On Tubes

TUBE manufacturers cannot state for publication their opinion of the WPB announcement of October 2nd that "combined military and civilian requirements for tubes after Germany's defeat will be 60 to 70 percent above present maximum production rates" which means there would be but few "MR" tubes until late 1945. Approximately 10 million tubes are now being made monthly but only 13 percent of these are reaching distributors monthly for intended civilian use.

The industry in general feels that the military services are building up too great a tube reserve stock. Meanwhile over 25 percent of all radios are now out of use, the great majority needing unavailable tubes. It would be perfectly proper for the RMA and NAB to suggest a review of the alleged over-stocking situation with the military authorities. Possibly a two month production run could be made expressly on civilian replacement types.

S. R. Lowan

RCA LEADS THE WAY

Plugging IDEAS that pay YOU in PROFITS

TAKE the RCA Preferred Type Tube Program, for example. A simple idea . . . concentrating demand on fewer tube types. A greater standardization of tube types in all makes of sets means simplified tube stocking for you. In addition, short manufacturing runs on tube types are inefficient. Longer runs mean greater uniformity and better tubes.

The idea was simple. Aggressive plugging by farsighted service-dealers, set designers, and by RCA sold it...and made it possible to prove that the Preferred Type idea really works.

And the payoff? Right in your cash register, as a result of more profitable service business.

Concentrating your tube sales on fewer types gives you:

1. *Faster turnover*
2. *Simplified ordering*
3. *Better deliveries*
4. *Lower tube costs*
5. *Reduced bookkeeping costs*
6. *Better tube performance*

Plugging the Preferred Type Program to help distributors, dealers and servicemen is another service for which you can look to RCA. It is a part of RCA's continuous merchandising program to provide sales support for you.

1919
1944

RCA

25 Years of Progress in Radio and Electronics

42-6731-23

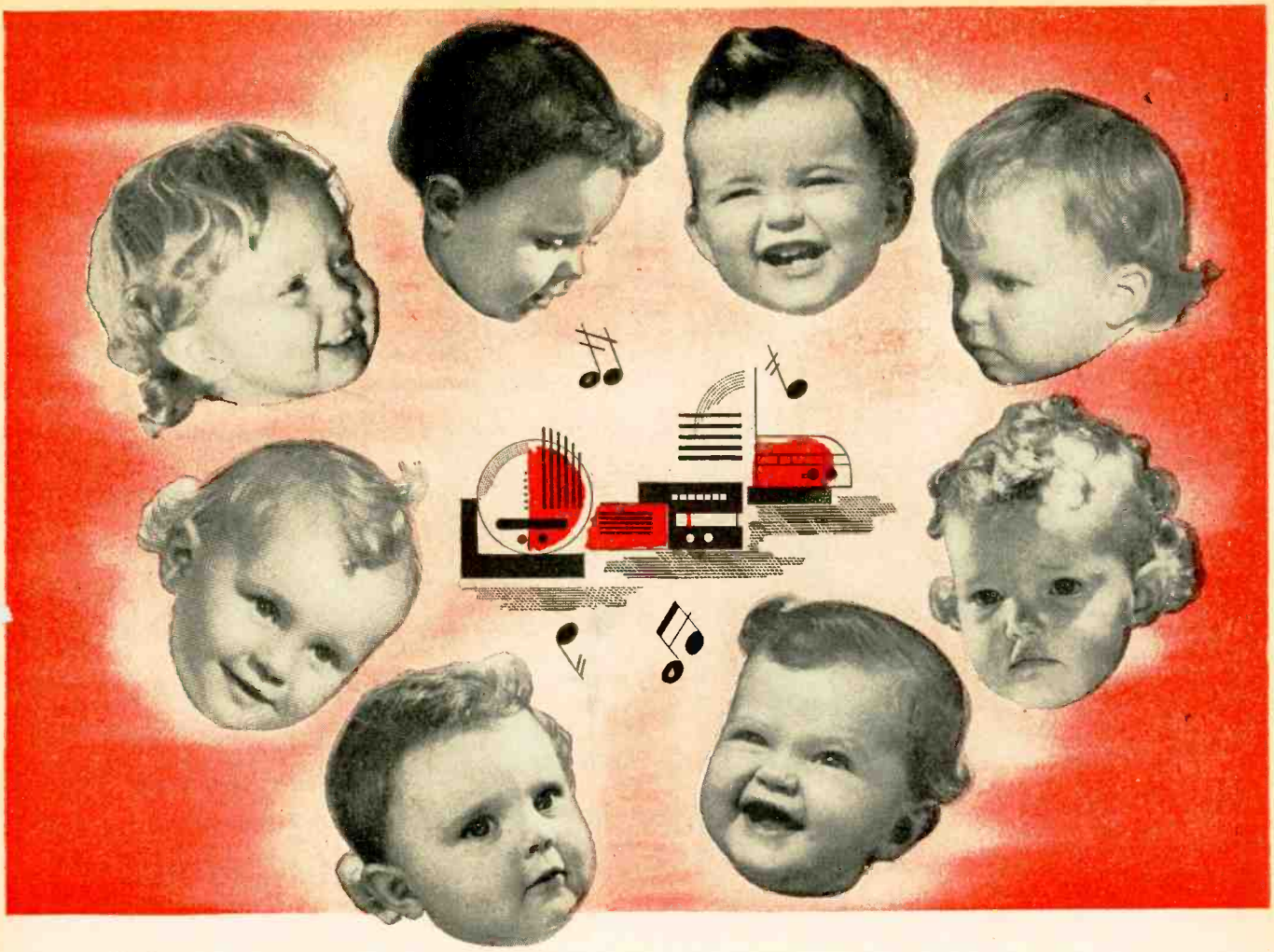
The Magic Brain of all electronic equipment is a Tube . . . and the fountain-head of modern Tube development is RCA.

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

RADIO CORPORATION OF AMERICA

RCA VICTOR DIVISION • CAMDEN, N. J.

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



SOME WILL BE OUTSTANDING !!!

Sure . . . all post-Victory radio sets will be new and different. They will be replete with enough new features, improvements and gadgets to astound most dealers . . . certainly all prospects. BUT (and it's a BIG "BUT") you can be sure that some *will be outstanding!*

You guessed it . . . Maguire Industries, Inc., Home Radio (Electronics Division) will have a prominent place in this outstanding group. Here's the reason: Maguire Industries' policy from the beginning has been based on the assumption that only the best research-engineering brains can conceive, design, and engineer products that will be outstanding in their field. Maguire Industries has been successful in obtaining the services of men acknowledged to be the best in the electronics field.

These scientists have produced a line of Maguire Home Radio Receivers devoid of all the common and uncommon "bugs" that harass listeners. This is a radio line you will want to display and sell. It guarantees customer satisfaction and the real profits that go with speedy sales and trouble-free operation.

Maguire Industries has won exceptional merit in wartime production . . . in the electronics field; in the small arms field ("Tommy" guns and other small arms); in the food processing field; in the oil producing industry. Now, Maguire Industries has turned the talents of its large staff of scientists, engineers, and technicians to creating products for after-Victory use.

A *tip* that costs you nothing . . . investigate the Maguire Home Radio Receiver Line now! You'll be surprised with Maguire Industries' liberal dealer policy as well as the exceptional radio. For full information, write Maguire Industries, Inc., 342 West Putnum Avenue, Greenwich, Connecticut today!

A NEW NOTE IN HOME RADIO

TRADE-MARK REG. U.S. PAT. OFF.

MAGUIRE INDUSTRIES, INC.
ELECTRONICS division

GREENWICH • STAMFORD • BRIDGEPORT • NEW MILFORD • NEW YORK

In & Around the Trade

Being a condensed digest of some of the happenings in and around the radio trade as compiled by the Editors

William J. Halligan (extreme right), of The Hallicrafters Co., introduced the military gentlemen who spoke at the "General Industry" luncheon of the Electronic Parts and Equipment Industry Conference held in Chicago last October. With him (l. to r.) Brig. Gen. J. V. Matejka; H. W. Clough, vice president, Belden Mfg. Co. and conference general chairman; Lt. K. Snyder, WAC; Comm. W. C. Eddy, USN.

Television Go-Ahead Urged

C. B. Jolliffe, chief engineer, RCA Victor Division, made the following recommendations in his statement before the frequency allocations hearing of the FCC recently:

1. That the FCC reaffirm its authorization for commercial television on standards recommended by the RTPB on an adequate number of frequencies to be selected below 300 mc, without limitations, physical or psychological, which would prevent it being universal and national in scope.

2. That it authorize the experimental use of a band of frequencies above approximately 450 mc, which can be used now for the experimental development of a new television system including color and which will provide room for an adequate number of stations to give a new television service when such new system has been adequately tested and determined by the Commission to be ready for the public and that the basis on which this additional service is introduced be determined at a later time when the system has been developed and is ready to serve the public.

The general idea is that the adoption of suitable frequency allocations will result in rapid design of home television receivers. Without prior knowledge of what frequencies television will be assigned, these designs cannot be drawn. The above recommendations are aimed at getting the wheels of the television industry moving without too much delay, and to enable those plants which are no longer engaged in war production to reconvert at the earliest possible moment.

Distributors Needed

Galvin Manufacturing Corp.'s new sales manager, William H. Kelley, describes some of the fundamental functions a radio distributor should perform, speaking for his organization: 1. Introduce and display the complete lines of Motorola home and car radios, military, police and fire radiotelephone systems and the "handie-talkie." 2. Carry a complete stock both of models and parts. 3. Help train the retailer's servicemen and salesmen. 4. Provide advertising, publicity and promotional aids and sales assists. 5. Stand by as a responsible, ready, able and willing trouble-shooter, reached by a five-cent phone call.

Lafayette Expedites & Expands

Two moves are announced by Lafayette Radio Corp., Chicago, due to increased business. One, rental of the entire fifth floor at its present location, where additional warehousing facilities together with the kit and cable department will be located. The other, is installation of a teletype connection, to expedite many industrial orders being received daily from all over the country.

Rauland Adds Visitron

Rauland Corp., Chicago, announce the recent purchase of the "Visitron," product of Phototube Division of GM Laboratories, Inc. of the same city. This acquisition, combined with the purchase two years ago of American rights to all patents and processes of the British-Gaumont electronic tubes, puts Rauland in a solid position in its field.

New G.E. Lineup

H. L. Andrews, vice president, announces another of General Electric's quinquennial rearrangements of men on the executive chessboard.

Newly created post of general sales manager of the appliance and merchandise department is given to C. R. Pritchard, who will be responsible to Mr. Andrews for all sales and sales policies of appliances and construction materials. New appointees responsible to Mr. Pritchard: A. M. Sweeney, manager of sales of major appliances; C. W. Theleen, manager of sales of traffic appliances and vacuum cleaners; J. H. Crawford, who continues as manager of sales of construction materials. A. L. Scaife is appointed merchandising manager for the entire appliance and merchandise department; L. H. Miller, manager of the household refrigerator division and C. J. Enderle, manager of the electric sink and cabinet division. New topman Pritchard comes from the General Electric Supply Corporation, where he has been vice president. M. B. Ross is manager of the heating device and fan divisions. R. O. Fickes, manager of the clock division.

More Mobile Radio Stations

Westinghouse Electric and Mfg. Co., announces six frequency modulation radio transmitters, five of them on rail-

(Continued on page 36)

Dr. G. Ziegler, Armour Research Foundation, plays back wire-recorder sounds of battle of Saipan for (l. to r.) Fred A. Ray, General Electric; Clifford J. Hunt, Lynn C. Holmes, Stromberg-Carlson; D. W. Pugsley, GE; Stanley H. Manson, Stromberg-Carlson; Marvin Camras, inventor of wire-recorder; B. Olney, Stromberg-Carlson; J. B. McConvey, Heroux Industries; C. T. Wandres, GE.

HARD SELLING WILL GET THE BUSINESS

Selling home radio receivers, refrigerators and other major household appliances will not be as easy after the war as a good many people are inclined to think. There will be new competitors. Every company has an ambitious program. There is going to be plenty of keen, intelligent, hard-hitting and no-holds-barred competition. It's going to be rough and tumble and the best man will win. "I don't go long," stated Mr. J. H. Rasmussen, ... took on his new duties as general sales manager, The Crosley Corp., in a recent speech to servicemen, "on those fancy pent-up demand, easy-to-make sales figures that come out of the numerous recent surveys. These surveys show that everyone is going to buy everything from an airplane to a new high-powered rifle. If we were to add up everything that everyone is going to buy, then we would have a dollar figure that would make our war debt look infinitesimal. And our horse-sense tells us 'that ain't horse-sense.'

"Today, Joe Doakes has a take-home of $70 per week, his wife $40 and his daughter another $40. After the war, Joe Doakes is still working—but the take-home is no longer $70 per week. He isn't working 56 hours a week any more; his wife and daughter have been laid off. Some of his friends have been laid off for a few months pending reconversion.

"That evening a salesman calls. This is no questionnaire, with a pleasant young thing asking what would they like to have—no money down. This time it's real business. If Joe says he wants it, the salesman will say, 'How much do you want to pay down NOW?'

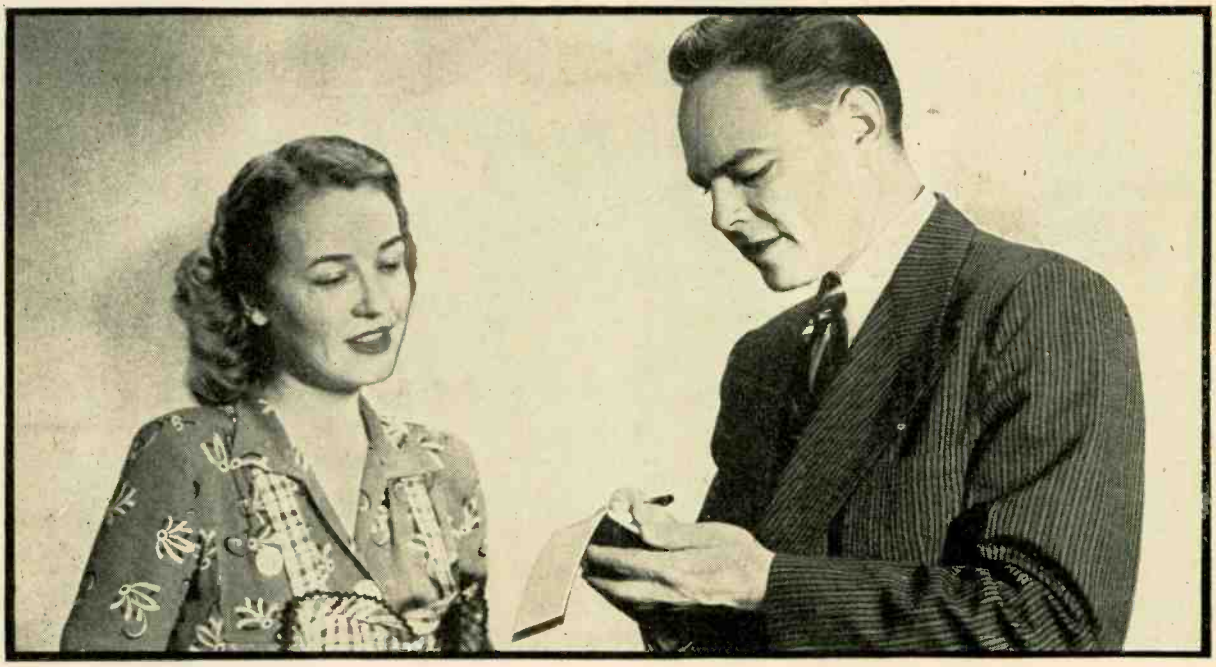
"When this happens, some of the people who told the questionnaire folk they were going to build an $8,000 house and buy everything that goes with it, will settle for a new refrigerator and a table model radio.

"So let's lay our plans on the ground—not up in the sky. . . . We are all set from a product and a distributor standpoint. But that's only the start of the job. The biggest task we have is a sales training job that carries on through to the retail salesman. And that is a truly big job. . . ."

The men " . . . who will roll up their sleeves and go to work in the good old-fashioned manner will be successful. They will have the satisfaction, once again, and the thrill, of having made a sale that required selling. They didn't get the order just because there wasn't enough to go around.

"There will be very little left over for those who insist upon continuing to wear rose-colored glasses. But there is going to be a lot of good, profitable business for those who prepare for it now." (See also RADIO SERVICE DEALER for October, page 15).

GET MRS. JONES' NAME IN YOUR LITTLE BLACK BOOK*



Bigger List—Better Business

Now you have Mrs. Jones' radio running smoothly again, and she's feeling mighty kindly toward you. She respects your opinion and has confidence in you. Don't let this opportunity slip by. Get Mrs. Jones' name in your "Rosy Future's" Date Book NOW—her name and facts on the new radio or phonograph she's been dreaming of. Then—when "delivery day" comes—cash in on the confidence you've earned. Pay Mrs. Jones another visit with that new MECK Radio or Phonograph—and let her buy from *you.*

Built to Perform—Priced to Sell!

*WRITE FOR *Free* "DATE BOOK" NOW

Pocket size, durable—get started on YOUR post-war plans now. Just write—it's free!

DEPT RSD-11

DISTRIBUTED NATIONALLY THRU RADIO PARTS JOBBERS

MECK RADIOS · PHONOGRAPHS
★ ★ ★
INDUSTRIAL SOUND

BUY WAR BONDS AND KEEP THEM

JOHN MECK INDUSTRIES, PLYMOUTH, INDIANA, U.S.A.

LOOK AHEAD for your TUBE SUPPLIES

Dealers encouraged to place orders ahead of time to get adequate tube supplies on time. Will aid manufacturers to schedule production of most wanted tube types.

RADIO tubes continue to be the big problem of the Radio Service Business. The number of tubes required by the military agencies is stupendous. The new super-bomber has over 800 tubes; some radar units use from 600 to 800 tubes each, and five complete extra sets of tubes are held for replacement reserves for each military unit. In spite of greatly increased facilities, because of the inherent intricacies of the military types and the more rigid inspections, the production of tubes today is numerically less than pre-war.

A few civilian tubes can be sandwiched in between Government orders. There are also a few over-runs and rejects. But these military types do not help the civilian shortage. The total number of civilian tubes available amounts to less than 1,500,000 per month. Before the war replacement tubes were used at the rate of about 33 to 36 millions per year. The increasing age of old sets and the lack of new radio sets has boosted replacement tube requirements to 60 or 70 million per year. If we get 18 million civilian tubes this year we will be lucky. Today, the average jobber gets about 30 per cent of the tubes he received in 1941.

How does this situation affect the dealer? A jobber who formerly sold, say, 60 thousand tubes a year (5 thousand a month) probably had at least 300 customers, who were in the service business or had service departments. The jobber now gets 15 hundred (30 per cent of 5 thousand) tubes per month—which is an average of 5 tubes for each of his 300 customers.

And here's the pay-off: The 15 hundred tubes the jobber receives are what the factories accumulate and allocate to him—not necessarily what he orders or needs the most. Among his 300 customers are some who formerly bought 3 hundred to 5 hundred tubes a month, and some who may have bought less than a dozen a month. The monthly allotment to the jobber may contain, for example, 10-6A7, 20-5Z3, 60-80, 6-1A7; no 12SA7, 35-50L6GT, etc., etc. How to allocate these tubes in a way that will keep everybody happy? The answer is, it can't be done.

So What?

. . . asks George D. Barbey (of the distributing firm of the same name in Reading, Pa.) in his comments addressed to dealers, from which this material is excerpted. We know that radio and radar will probably be one of the last industries reconverted to civilian production. There will be no new sets until well into 1945, the tube situation will not improve much before January next—and not even then, unless Germany is completely knocked out of the war. But, when the break comes, it will come fast.

On V-E Day there will be a lot of cancellations of military orders. Instead of letting tube machinery stand idle, the manufacturers will swing to civilian types, without loss of time. So what?

Advance Orders Needed

1. Q.—What tubes will the manufacturers produce? A.—They will manufacture against definite orders on file.

2. Q.—What orders will they have on file? A.—They will have the advance orders filed by the distributors.

3. Q.—Why are the distributors filing advance orders? A.—Because they believe in the future of the radio repair business, and wish to be in on the ground floor when civilian production begins.

4. Q.—How does the jobber know what to order? A.—His orders are partly based on experience and judgment but largely based on advance orders taken from service dealers. Only by checking dealer stocks and figuring requirements, based on sets out of service, can the actual needs of a territory be gauged. Only through a careful census of requirements can renewal of civilian business be anything but a wild scramble.

5. Q.—What factors will control the manufacturer's procedure in building up civilian stocks? A.—Tube production is affected by the following factors:

a. To build tubes economically, the factory must make a long run of one particular type.
b. During normal times a factory will run from a three months' to a year's supply of one type before changing the machinery to run another type.
c. Certain assembly lines can make only certain types of tubes.
d. It is possible to run only a few types through a factory at a time—one type on each production line.
e. If all factories would change over 100 per cent to civilian tubes on the same day, it would still take from four to six months until the 150 most important tube types could be built and stocked.
f. If a factory runs 50L6GT tubes on its first run, and makes immediate shipment, it will probably be six months before it can get around to building and shipping the same type again.
g. The total number of tubes of certain types used by the entire industry is so small that economy requires that one manufacturer makes all of them and exchanges them with the other manufacturer.

6. Q.—What, then, should the dealer do at the present time? A.—The dealer can do as follows:

a. Take stock, including "dogs," and make a list.
b. List the standard stock of tubes carried in normal times, as 1941-1942.
c. Make necessary adjustments to this standard stock to take into account decreasing demands for some types, and increasing trend of demand for other types.
d. List the probable requirements to put the "out of service" sets into operating condition.
e. With these lists before him, the dealer might make out an advance order, having the following considerations in mind:
   1. It is almost a "must" if the dealers wants to get tubes when the limitation order goes off.
   2. Ordering liberally. If the dealer orders a thousand tubes in advance, say, he will probably get no more than 10 per cent of the order the

first month after production starts. The balance will just dribble in.

3. Ordering plenty of the scarce types. The demand will be enormous, first shipments will be small, and when the first run of a type is sold out there may not be another run of that type for months.
4. Ordering everything on the list. The dealer will need the odd types because the repair of old sets will continue. There will not be the expected wild scramble for new sets, because many customers will have the old set repaired and wait to "see what happens" to FM and television.
5. No delivery date can be promised, or even estimated. Military requirements, cancellation of limitation orders, materials, man-power and the date of V-E day will determine production and delivery dates.
6. It is expected that tubes will never be any cheaper than they are today, so dealers need not worry about price.
7. By making up advance orders, dealers can help manufacturers plan their post-war production.

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* EDITOR'S NOTE: *The substance of the foregoing has been used by Mr. Barbey in talks before groups of radio service men and dealers in a number of cities. The material was made available through the National Electronic Distributors Association.*

More Electrical Servants

. . . from the "knife & fork" table appliance to the major home "aides and servants" . . .

. . . will be good for the dealer and for his service department. Newspapers are taking up the challenge of post-war electrical appliance sales (and advertising) by means of full page ads. "The Washington Post" headlines a series of ads (published in the interest of a prosperous post-war America) "Help Yourself to More Electrical Servants." The fellers who will make the stuff are sold to the public, " . . . Our manufacturers make the most reliable and trustworthy things on earth. They will offer you proved items they can stand behind and let radical new departures work their way slowly, as always, into the future American scene. So help yourself to electrical servants, tried and true—but improved—as soon as they're offered. . . . You'll get a big money's worth—and you'll help your country too. . . ."

The reader (who is almost any radio service and appliance dealer's actual or potential customer) is reminded that he can contribute to prosperity. ". . . A prosperous America calls for full employment. The first products off the production lines will be good products. They will bear the name and guarantee of reputable American firms. To meet the prescription for post-war prosperity, these products must be bought . . . This message is to reassure those who plan to buy or need to buy that they will be offered excellent electrical appliances. . . . Not to buy when you need, is to deprive yourself of necessary equipment and help slow up the employment that spells prosperity for all of us . . ."

Which is about as good a way as any we have seen of priming the American public to do its "buying bit" in the lines that will do the most good to the majority. Electrical appliances and radios have been the most imposed upon in the war of *materiel* production, and accordingly there is a deep backlog of demand in every consuming family for these items.

Advertisements like the above are intended to dispel the attitude discovered by many recent surveys which too many people have expressed, to "wait and see" before they buy the things they want and need after the war.

The part that the radio and electrical appliance dealers will play in the post-war period to enhance the prosperity—as well as the comfort standards—of the country is almost beyond computing. From the "knife and fork" table appliances to major household "aides and servants," these dealers will h the purchase, display, sale and servicing of every kind and type of electrical appliance used by every family throughout the nation.

Advertisements like the above are intended to start people thinking along practical, realistic lines regarding post-war products. RADIO SERVICE DEALER is glad to give its readers a picture of what the advertising industry is doing right now to promote the buying of electrical appliances and radios in the post-war and peace-time era which all of us await eagerly. —*L.C.S.*

MAKES SERVICE A GIFT

Holiday promotion puts this dealer on Xmas giving lists through Service Certificate.

SERVICE only is what Bill's Service Shop has been merchandising successfully for over a year in Pulaski, a small town of less than a thousand people. But a satisfactory service clientele is available from its rich N. Y. State farming territory and numerous hamlets nearby. Besides radio and home appliance service and repair work, the shop also handles electric fence installations, wind chargers and electrical farm equipment of all types.

The show window carries a placard, "We service everything electrical," the scope of the shop's capacity to do this work being pictured with numerous articles and appliances displayed in the window.

Bill's has several plans for this Christmas. Last year it tried issuing "Service Certificates" in amounts of $2.50 to $10. They will be repeated this year. Letters will be sent out describing the service certificates and pointing out their value as gifts. In its November ads, the shop stresses that such certificates will be remembered the year around. Certificates might be used any time for any number of service calls until the face value is exhausted. There is nothing elaborate about them: they are merely typewritten slips showing that a certain party is entitled to a certain amount of dollars' worth of radio and other service and repair work during the year.

Certificates are mailed special delivery in attractive holiday envelopes, together with appropriate greeting cards, to reach the recipients in time for Christmas. Last year Bill's sold many of these certificates, and expects to do even better this year.

For three weeks, running to the middle of December, the shop also has an ad running in the local paper. Under the heading "Don't miss out on your favorite Christmas Programs—have your radio checked now," Bill's lists special Christmas programs which will be heard on the air over the national hookups.

To stay in the good graces of its customers, the shop will not accept any new service work after December 17th, to enable Bill's to clean up all the repair jobs on hand in time for Christmas.

WHY BOOM IN RECORDS

Dealers will be interested in facts and figures on the tremendous market created by boom in records for post-war combination radio sales

by G. E. GUSTAFSON
Vice president in charge of engineering,
ZENITH RADIO CORPORATION

. . . Will Boost Sales of Radio Combinations

A SPECIAL MERCHANDISING FEATURE

The boom in records is getting bigger and bigger. Many a service dealer has found that this merchandise is a splendid source of income. For pointers on how big the record business is actually, and on modern methods of merchandising, readers are referred to 7-page feature which begins here.

1

Records in Demand

PUBLIC demand for records showed a definite record-playing trend in the two year period during which but few sets have been available for sale. Back in 1925 when radio first came actively onto the music scene, the demand for records and good artistry in records decreased considerably. The following ten years of intelligent planning and good direction of radio programs revitalized the popularization of all types of music. The American public became music conscious all over again. This trend has continued for the last eight or nine years to a point where today sales of records surpass the heydays of the phonograph era.

In 1937, dealers sold $16,000,000 worth of records, turning over some 31,000,000 individual discs. This demand increased year by year until in 1941, dealers' sales rose to $51,000,000 with 117,000,000 units sold. . . . An increase in both sales and volume of over 300% in a six year period!

The scarcity of materials in 1942 caused record sales to drop slightly to 110,000,000 discs which dealers sold for $48,000,000. But in 1943 sales rose and surpassed 1941's figures: dealers sold $52,000,000 worth, and turned over some 120,000,000 discs to get that money. Dealers did the biggest job in their record history!

Records in the hands of distributors and dealers have provided a splendid stimulant to sales and store traffic during these days of hard-to-get items. It is generally agreed that they have been one of the strongest factors in helping the majority of radio dealers to stay in business during the difficult product-less days of '42, '43 and '44.

With this constant and steady increase of record sales both in the popular and classic groups, it can be seen that good record playing facilities are going to be more in demand than ever, when they are again on the market.

2

IN making your plans for post-war sales and display have you, as a dealer, considered the fact that a waiting market for over 6,000,000 combination radio sets (more than the *total* production of all radios in 1938) is eager to purchase radio combinations that will furnish the millions of new home planners and new home owners with a complete variety of entertainment and the best in music?

At the outbreak of the war, there was a tremendous backlog of orders for radio combinations in table, console and deluxe models. The same people who wanted them then—and more, who have become record-playing enthusiasts during the past two years—are going to want them more than ever when they are available again.

Combination Sales Gain

In 1938, approximately 6,000,000 radios were manufactured, which dealers sold for $210,000,000. And how many radio combinations were sold? About 3.6% of the total—216,000 units—for which dealers received over $14,000,000. But this sum was almost 7% of the total sales!

The constant increase which carried on through 1941 (the last year of total sales figures available) brought the production of all radios to over 13,000,000 units, which dealers sold for over $460,000,000. In that year radio combination sales had jumped from the 3.6% in 1938, to 14%, with a total of over 1,825,000 combination sets produced.

Even more spectacular than the percentage of production increase was the value of dealers' sales—in excess of $156,000,000. This tremendous sum represented over 34% of the entire value of dealers' sales of *all* radios in 1941.

THE BOOM IN RECORDS

A SPECIAL MERCHANDISING FEATURE

New Post-War Selling Features

Leading record manufacturers are developing new techniques in producing "master" and copies to provide higher quality records with emphasis on less surface noise and more realistic reproduction. Obviously these advantages will not be available until after the war and until the critical materials needed for these improvements will make it practical on a scale large enough to permit widespread distribution of the new records.

On the combinations, automatic record changers, Frequency-Modulation and improved radio features will be combined to supply the advantages of FM fidelity for record reproduction. This will be made possible by the incorporation of certain of the FM components in the record-playing circuits of the sets.

The need for reduction in the size of some of the cabinets has been obvious. Compactness will definitely be studied in chassis and record changer designs to provide a better balance in furniture construction and appearance. And tone will come in for its share of improvement by acoustical adaptation of available cabinet space in the various models.

Storage space for records in use at the set will be improved. It must be considered that it will never be practical to include storage space within the radio cabinet in excess of albums for one evening's program. Coordination on the part of furniture manufacturers and cabinet specialists is expected to provide a selection of separate record-compartment cabinets of both closed and open bookcase styling.

Generally speaking, post-war plans include of course, table and console models, with either AM or FM reception and reproduction circuits, and manual or automatic record changers. All of these features may be combined in the deluxe models.

MECHANICS OF
Record Merchandising

by LEWIS C. STONE
Managing Editor

Spread of self-selection record merchandising proves this point-of-sale promotion device helps dealers build substantial volume increase with minimum selling help

SALES tests conducted recently by RCA Victor Division of Radio Corporation of America established a number of important basic pointers—chief among them, the principle of self-selection—on record merchandising, as a means of developing bigger volume sales on both single discs and record albums, in all categories.

The idea of self-selection has had plenty of workout in food stores, where this type of display has doubled the sale per customer. And besides, surveys by the company showed that customers came out of ordinary record stores with less merchandise than they went in to buy. Further, after contacting many types of retail outlets and seeing mass displays of books, expensive china, etc., it seemed desirable to work out something as modern for point-of-sale disc merchandising.

The arguments were plenty against self-selection, in the beginning. Some record dealers were of the opinion that discs of any kind should not be sold through self-selection because theft and breakage would be too high, that the clerk was too important a factor in the sale, and other reasons most of which did not tally with the experience of progressive retailers in other commodities.

Tests Make Good

The first practical test of the self-selective record selling technique, conducted in a number of retail outlets and departments proved that the public likes this method of shopping for records. Quotations from customers, taken from another survey: "It makes it easy for one who doesn't know much about music." "I'm re-

Figure 1

Figure 2

Above, this rack for popular best sellers is efficient for merchandising current hit-tunes. Only the tier-effect display unit need be built if counter tables are available. Left, the records share the selling job in a self-selection store. Here is a tier table display of populars, decorated for the Christmas season—an effective means of promoting more unit-sales at point-of-purchase.

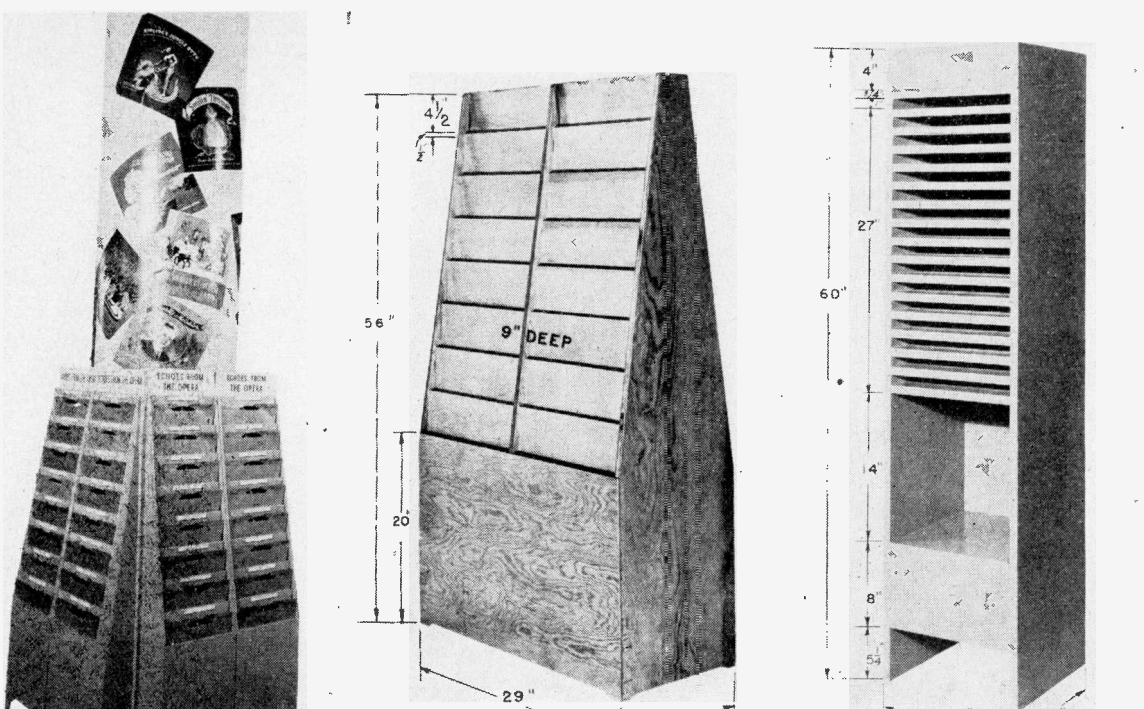


Figure 3

SALES UNITS THAT INCREASE THE UNIT-SALE PER CUSTOMER

Left, slant type rack displays records vertically, with a third of the record envelope showing. Center, basic dimensions for slant rack either for island display (back to back as shown) or for partition and column display. Right, single record racks display discs horizontally, six records to the slot. Dimensions are for the single unit, which you can combine for your massed displays.

minded of a lot of things I've wanted and forgotten." And—what is music to every music merchandiser—"Every time I come here I buy more that I intended to."

The self-selection merchandising test was discontinued after some months' operation. The customers continually asked when the "department" would be re-installed. Which proved the public liked the idea. But the company also proved to its own satisfaction that it had to go a long way in developing a really efficient self-selection operation. Analysis of the experiment indicated the need for improved fixtures to display albums and single records; for improved methods of mass display and promotion; and for better classification of discs and sets for customer-convenience.

Benefiting from this initial experience, a complete self-selection record department was installed in one of the first try-out stores. During its eight months' operation, operating procedures and physical facilities were under constant study and revision. By the end of that time major problems were solved satisfactorily. A basic operating pattern for dealers has been established, the highlights of which are given in this article.

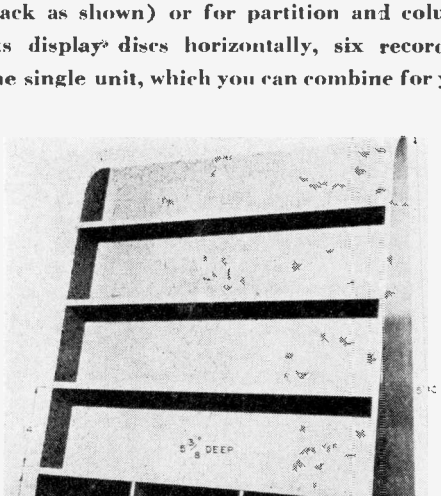


Figure 4

Rack for album display, with dimensions for constructing a typical unit. This is a partition fixture for showing sixteen 12-inch or twenty-four 10-inch albums. The width is not fixed: it can be varied to fit dealer's available display spots.

More Dollars for Dealers

Conclusions drawn from the tests:

1. Dealer sales volume can be increased by self-selection.
2. Dollar sales of classical single records, usually small by comparison, were brought up close to the volume secured from classical albums.
3. Sales production per square foot of record display area was maintained at a high level even in a larger area than the conventional record section or department.
4. Sales personnel could handle approximately three times the volume that it handled in a conventional record department. This means lower selling costs.
5. Approximately 90 per cent of the volume in the test operations was done on a cash basis.
6. Shop wear, theft, and breakage have been normal.

To make the merchandising pic-

(Continued on page 41)

DEALER-HELPS *for Bigger Xmas Sales*

This year Xmas record promotions feature compact and colorful point-of-purchase displays. Dealers can use units for window or inside spotlighting of top records

RCA-Victor:

A kit of Christmas material for dealers will contain eight holiday theme standee cards with easel backs. Each card will picture a Christmas tree and each highlights a different gift classification: "For Mother," "For Father," etc. The kit includes 25 feet (in five foot strips) of gummed paper valence material with seasonal decorations. It will also contain pads of blank gift certificates for recipients who want to do their own record choosing, and twenty title strips of Christmas hymns and favorites which are being plugged as standards. These strips fit single record merchandisers and mass record displayers.

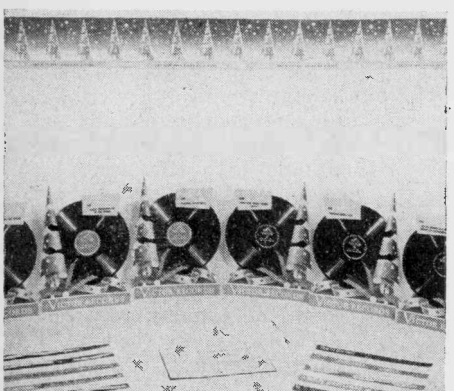
According to Jack Williams, director of advertising, this marks a radical departure from the company's usual Christmas promotion procedure. The usual system has been to get up a jumbo display piece which would take up a whole window. This year it is hoped that by putting out smaller display stuff which will fit into any window and which can be used also in any other part of the store, dealers will have a more flexible merchandising display.

Backed up by radio advertising on the "Music You Want" program, the Christmas promotion appeared in a double-page color ad in Life for October 30th and will be followed by another on December 9th. A 64-page booklet in four colors showing all the records plugged in the national advertising is being offered as a throw-away for dealers to give their customers. This booklet is expected to have a circulation of almost half a million copies. The company is also rushing the re-release of Milton Cross's reading of the familiar classic, "The Night Before Christmas," which will be housed in an attractive new four-color jacket with appropriate seasonal decorations.

Richard Gilbert, director of repert[illegible] for the company, is extremely e[illegible]astic about two new 12-inch recordings of Christmas Carols under Robert Shaw with Victor Chorale. The two records contain twelve [illegible] the world's favorite carols, all pe[illegible]ed at a snappy clip—unlike the [illegible] dirge-pace of such music.

A major release for Christmas is—for the first time—recording of a Toscanini performance of operatic excerpts, with soloist. This is Brunnhilde's Immolation scene from "Die Gotterdammerung," which depicts the complete collapse of the dream-world of Richard Wagner, Hitler's favorite composer. It is one Wagner-item which at this particular moment would really have Herr Schicklegruber chewing rugs. Secondary promotion will be given to a re-release of six records of Scandinavian songs, in a picture album by Lauritz Melchior.

In the field of children's records, ten albums will be re-issued, done up in attractive new packages decorated by



Above, part of the contents of dealer X'mas promotion kit by Victor. Overall size of full kit enables use alternatively as window display with other dealer lines, and for inside featuring on selling floor. Discs each highlight personal gift suggestions for various members of the family. Right, Asch albums display attractive illustrations in poster colors, highlighting topflight stars and selections. Counter easels accommodate individual albums for show at point-of-purchase.

artists and illustrators well known in the children's book field.

Selected for popularity as measured by dealer demand and past sales, the re-issues have also been chosen for their educational and entertainment value, and for the charm of the story they suggest to the child listener, who may be tomorrow's serious music lover.

For the convenience of dealers and customers, the children's releases have been broken up into three age groups: 6 and under; up to 12; and 12 and over. There are also re-issues, in the familiar red wrappers formerly used for all children's holiday packaging, of sixty 10-inch records of proven favorites, for the Christmas trade.

Columbia:

James Flora, advertising manager, announces that the company's Christ- dealer promotion this year fea- e theme, "Tidings of Comfort and Joy." This is being carried through all the merchandising—local advertising mats, large point-of-sale posters, and three-dimensional window displays.

There are four gift-suggestion hangers, two of which illustrate pop and Masterworks albums in full color. The other two give listings of children's records and Christmas music. A supplement lists all the records that will be available for holiday shoppers on the dealers' counters. The supplement is designed as a mailing piece, and also as a handy gift check list for shoppers within the store. The new 1945 catalog and a companion piece which lists all the Masterworks albums, illustrated, are also tied in with the Christmas promotion activity.

Holiday promotion brings dealers a "show-window within a show-window" in Columbia's three dimensional display. Advertised theme, "Tidings of Comfort and Joy," is tied in with gift suggestion hangers and posters for run-of-the-store use. Different sized mats are available to dealers for local advertising, carrying the theme slug featured in the general merchandising.

Regular disc favorites are featured by Decca in dealer promotions for the holidays. Sales are pushed with gay album covers, colored posters and counter-cards to catch the wandering shopper. Sonora's promotion gives the dealer the breaks with its all-year favorite "Uncle Don".

Decca:

Promotional plans to help the dealer get his share of the 1944 Christmas business fall into two categories. One is a group of colorful, attention-getting posters. The other is a similarly interesting group of counter cards. Both are for use at point-of-purchase—in the dealer's store.

Special selections of perennial favorites for Christmas selling are being offered to dealers. Bing Crosby is chief among them, singing: White Christmas, Silent Night, Adeste Fideles, Faith of Our Fathers, God Rest Ye Merry Gentlemen, Let's Start the New Year Right, I'll Be Home For Christmas. Bing also joins the Andrews Sisters in Jingle Bells, and Santa Claus is Coming to Town. Dick Haymes and the Song Spinners have made a brand new record of The First Noel, and Cradle Song of the Virgin.

The time of gift buying is held fitting for the plugging of year-around favorites, such as: "Oklahoma," in a new symphonic version by the Philharmonic Orchestra of Los Angeles under the direction of Alfred Wallenstein. And then there is Lewis Car-

roll's "Alice in Wonderland," with Ginger Rogers as Alice, conducted by Victor Young. Charles Laughton does a reading of "Mr. Pickwick's Christmas," from Charles Dickens, with musical accompaniment composed and conducted by Hanns Eisler. Norman Corwin directs "The Lonesome Train," an album of a musical legend telling the story of Lincoln's funeral train, with music by Earl Robinson. Charles Boyer offers readings in French of "Liberte, Egalite, Fraternite."

The merchandising effort on behalf of dealers has been planned to provide them with records that should appeal to everone's palate—young and old, in the Services or in civil life.

Sonora:

Herbert Summers Hall, vice president, indicates that due to the limited production of record lines this year, Christmas promotions will tend to tie in with a few outstanding items. A "red-hot" Christmas number is Uncle Don's Playland Album, which is being promoted with counter display cards and newspaper mats.

To tie in with the activities of the dealers on this album. the company has set aside a portion of its national advertising in which Uncle Don's album will be featured. The ads will run in Click, Liberty and American Magazine —totalling a combined circulation of over 5 million prospects per issue.

Asch:

Gift shopping is helped along by well-drawn poster decals, in full color, for display by dealers. They feature Burl Ives in American songs and ballads: Buckeyed Jim, Blue Tail Fly, Henry Martin, The Bold Soldier, Foggy Dew, Black is the Color, Sow Took the Measles and Poor Wayfaring Stranger. "American Folksay" is another album of American ballads and dances which include: Cindy, 900 Miles, Who Is Goin' To Shoe Your Pretty Little Feet and others, featuring artists like Wood Guthrie, Josh White, Lead Belly and Pete Seeger. Mary Lou Williams performs in an album-full of Little Joe, Roll 'Em, New Drag, Mary's Boogie, St. Louis Blues, and Lullaby of the Leaves. James P. Johnson is featured in an album called New York Jazz. An album of Blues offers Josh White, Jack Dupree, Sonny Terry, Nora Lee King and others. And a special Christmas note for young listeners is a re-telling of Old Testament stories of "In The Beginning"—Adam, Eve, Noah and His Ark, The Tower of Babel, Abraham, etc. Josh White has an album all to himself.

Merchandising displays for the promotion of the sale of this company's offerings of Americana consist of counter cards with easel backs, and special cardboard racks holding one album broadside-on for handy shopping.

Others:

As this issue of RADIO SERVICE DEALER goes to press, some record-producing companies are still in process of organizing their dealer promotions for Christmas. A few independents are in the enviable position of having far more orders for their discs than they can handle, in view of manpower shortages. They have therefore had t choose "not to run" into any spe promotional activities to help along to peak holiday sales.

Any such step would put them in an entirely false and uncomfortable position. Their problem for the present is not to push for peaks, but to keep pace with a peak demand from dealers that lasts throughout the year. And this notwithstanding the fact that the larger record manufacturers have recently entered the field of the populars with re-issues of earlier "takes" by nationally famous artists.

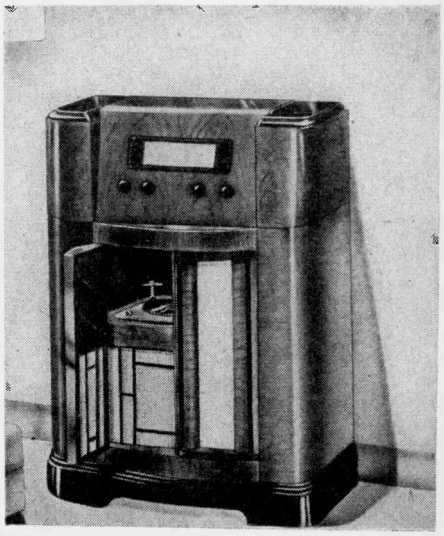
What Kind of Merchandise?

A FORECAST

Standard phonographs and disc records held best for home market. Low-cost record changers installed in more radio receivers postwar will up dealers' sales

BEFORE the outbreak of the war, the volume of record purchases had already equalled the all-time high achieved in the 'good old days' before the advent of radio. These totals are expected to be left far behind when record production begins to catch up with demand.

It is estimated (in a newsletter sent by RCA-Victor to its dealers and distributors) that only 15 per cent of the potential record market is equipped with phonograph turntables. Phonograph production for civilians stopped in April, 1942. With the resumption of phonograph



THE DISCS HAVE IT: Postwar radio combinations (like this one by Meck) continue record players for big disc-owning market. (See also page 34).

manufacture and the incorporation of phonograph turntables into a large percentage of postwar radio receivers, the market for records may be expected to increase enormously.

Phonograph records have come a long way since 1877, when Thomas A. Edison invented his famous tinfoil machine which not only recorded, but reproduced sound. Reproduction with the Edison machine was so crude that the "gadget" was thought to have no practicable value. The real commercial history of the phonograph dates back to 1897, when Emile Berliner developed a flat disc record with a laterally undulating groove, which not only vibrated the reproducing stylus, but guided it across the records by means of a spiral groove.

Tracing the development of recording, the eventual conversion of great concert and opera artists to recording industry (Enrico records, for example, have earned well over $3 million in royalties for him and his estate), and the important effect of radio on the musical tastes of people everywhere, it is believed that popular demand for recorded music of all types has been so great since the late thirties that the industry's record production has not yet been able to catch up with it.

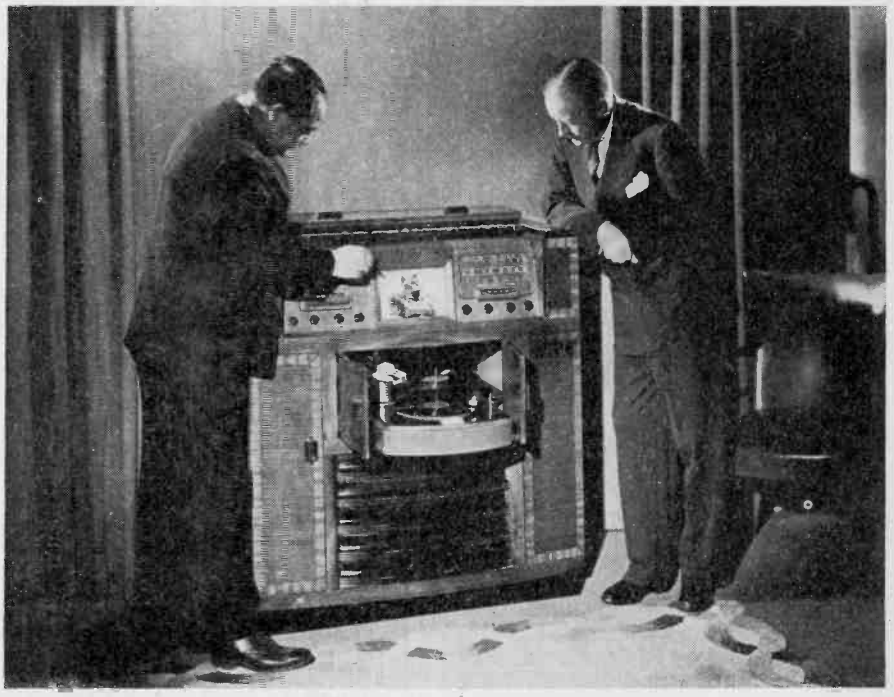
What Dealers Will Sell

As for recently-publicized so-called "revolutionary" methods of recording—such as strips of film, or tape, or a wire—research laboratories (such as those of RCA-Victor and other companies) are investigating the possibilities of these recording techniques. The conclusion seems to be that the present types of recording for home records is regarded as the most practical.

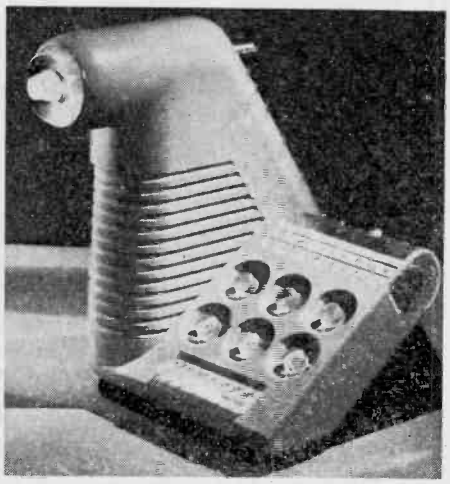
The disc method provides music of exceptionally high quality at low costs, in such simple form that a child can make full use of it. Moreover, the newsletter points out, discs offer the advantage of pre-selection. We may hear any portion of a symphony or popular hit at will, or all of it. The perfection of automatic record-changing mechanisms of low cost within recent years has made it possible to pre-select a symphony or other musical program that can be played for more than an hour. It is generally held, therefore, that nothing now contemplated in the manufacturers' laboratories or in use commercially at present shows any signs of offering such flexibility, tonal fidelity and simplicity, at low cost, as do the conventional disc and phonograph.

Looking ahead to post-war eventualities, dealers and distributors may expect many improvements in recorded music, but not necessarily overnight. The use of synthetics or plastics in record compounds will provide better records, with less surface noise and that are less liable to breakage. Further progress is anticipated by the development of techniques for recording orchestral music "for the dimensions of the home," as distinguished from performances designed for the concert hall or theatre, bringing about even more natural tone quality.

The chief obstacles in the way of meeting current demands for records are limited manufacturing facilities, manpower and packing material shortages. With the widespread use of industrial music—the reproduction of recorded music over plant broadcasting systems—to help increase war production, it appears that, as wartime restrictions on the manufacture of sound systems are lifted, there will be an even larger demand for the discs.



DISCS GO DE-LUXE: Working model of Admiral Corporation's new 8-in-1 radio-tele combination which dealers may soon offer for about $1,000. This "live" product is being admired by K. Turner and R. A. Graver, Admiral executives.



THE DISCS HAVE IT: Platters are the "dish" served up in music-crammed programs over the air, and also for rebroadcasts of important news and messages. At right, designers Barnes & Reinecke describe this ("the time is not yet") creation as a television entertainment unit of the future, with a radio and wire recorder instead of a phono-player to make it a complete entertainment unit.

AN EXCLUSIVE "RSD" FEATURE

DEVELOPED WITH THE COOPERATION OF THE ENGINEERING DEPARTMENT, SYLVANIA ELECTRIC PRODUCTS, INC.

UP-TO-THE-MINUTE

Tube Substitution Charts

KEY ARTICLE: CIRCUIT MODIFICATIONS REQUIRING ADDITIONAL RESISTORS

THE following article explains one of the ways in which a 150 ma. tube may be used to replace a 300 ma. tube in a receiver and also indicates a method for the substitution of a 300 ma. type for a 150 ma. tube. The tube types shown have simply been chosen as examples and do not indicate any specific equipment. The principles involved, however, are essentially the same regardless of tube types.

$$R1 = \frac{\text{Filament Volts of 150 ma. tube}}{.150}$$

$$R2 = \frac{\text{120 minus sum of tube voltages}}{.150}$$

Fig. 1 shows a typical 300 ma. filament string including a series resistance of approximately 150 ohms exclusive of the tapped section. The

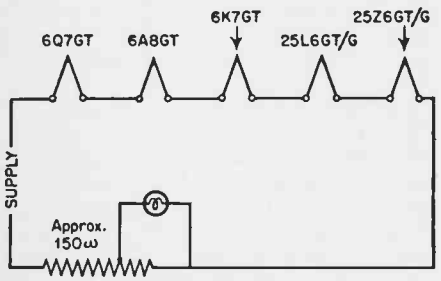


Figure 1.

resistor is shown as a tapped resistor since in many cases ballast resistors with the tap were used. In this case the pilot lamp rating will be less than 300 ma. Many receivers were built in which a 300 ma. pilot lamp was employed and no resistance was shunted across it. For those cases the resistor shunting the pilot light in Fig. 1 may be considered to be open.

Let us now suppose that the 25L6GT/G tube has burned out and that it is impossible to obtain another output tube of this type. Assume that the only power output tube obtainable is the 50L6GT. This tube requires only 150 ma. and, therefore, we must shunt the filament with a resistance which will by-pass 150 ma. of the total heater current. This will require a resist-

SUBSTITUTE TUBE CHARTS

THE following charts are the first 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 on page 24).

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.

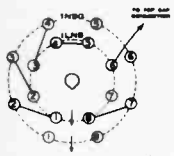
One of the biggest problems is finding a substitute which will fit mechanically into the space available. This must be found by trial for each job. Sylvania Lock-In types are shown as replacements whenever possible so that advantage can be taken of their small size. In many cases a Lock-In tube plus an adaptor will take up no more space than the original type.

RADIO SERVICE DEALER will continue this series of tube substitution charts in consecutive issues. The series will include 300 ma. tube types, battery tube types, and transformer and auto types. Please file this number of RADIO SERVICE DEALER for future reference, as the introductory article explaining the circuit modifications requiring additional resistors will not be run again, but will be referred to in future charts.

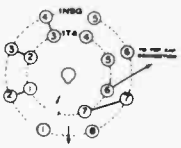
ADAPTOR CIRCUITS COMMONLY REQUIRED

AMPLIFIERS

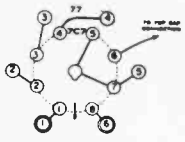
TYPE 1LN5 REPLACING TYPE 1N5G



TYPE 1T4 REPLACING TYPE 1N5G

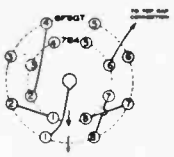


TYPE 7C7* REPLACING TYPE 77 / 6C5
TYPE 7A7 / 787* REPLACING TYPE 78 / 6D6

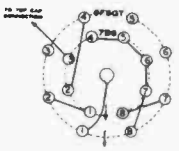


* REQUIRES 42 TO 80 OHMS ACROSS HEATERS IN AC-DC SETS

TYPE 7B4 REPLACING TYPE 6F8GT

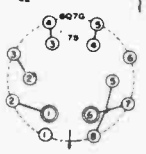


TYPE 7B6 / 7C6* REPLACING TYPE 6F8GT

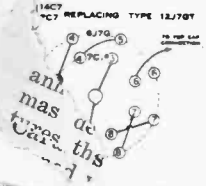


* REQUIRES 42 TO 80 OHMS ACROSS HEATERS IN AC-DC SETS

TYPE 79 REPLACING TYPE 6Q7G
TYPE 43 REPLACING TYPE 25L6
TYPE 41 / 42 REPLACING TYPE 6F6 / 6K6 / 6V6

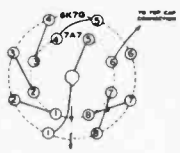


TYPE 7C7 / 7L7 REPLACING TYPE 6J7GT
TYPE 14C7 / 7C7 REPLACING TYPE 12J7GT

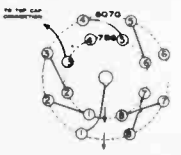


* REQUIRES 42 TO 80 OHMS ACROSS HEATERS IN AC-DC SETS

TYPE 7H7 / 7A7 REPLACING TYPE 6K7GT
TYPE 14H7 / 14A7 REPLACING TYPE 12K7GT

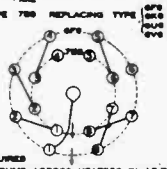


TYPE 7B6 / 7C6* REPLACING TYPE 6Q7GT
TYPE 7C6 / 14B6 REPLACING TYPE 12Q7GT



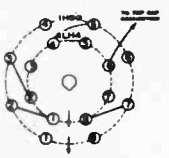
* REQUIRES 42 TO 80 OHMS ACROSS HEATERS IN AC-DC SETS

TYPE 1LA4 REPLACING TYPE 1A6
TYPE 25A6 REPLACING TYPE 25L6
TYPE 50A5 REPLACING TYPE 50L6GT
TYPE 14C5* REPLACING TYPE 25L6G / 25A6G
TYPE 7A8 / 10DL REPLACING TYPE 6C8GT
TYPE 7B8 REPLACING TYPE 6F8 / 6K6 / 6U6 / 6V6

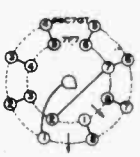


* REQUIRES 175 OHMS ACROSS HEATERS IN AC-DC SETS AND 42 OHMS IN SERIES STRING

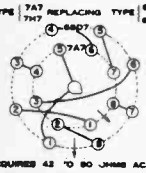
TYPE 1LH4 REPLACING TYPE 1H6GT



TYPE 7Y7 REPLACING TYPE 6BC7GT

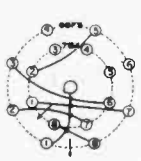


TYPE 7C7 / 14C7 REPLACING TYPE 12BJ7GT / 6BJ7GT*
TYPE 14H7 / 14A7 REPLACING TYPE 12BK7GT
TYPE 7A7 / 7H7 REPLACING TYPE 6BD7GT / 6BK7GT



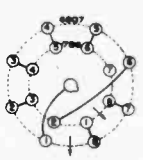
* REQUIRES 42 TO 80 OHMS ACROSS HEATERS IN AC-DC SETS

TYPE 7B4 REPLACING TYPE 6BF8

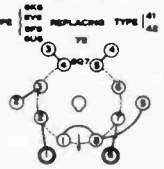


TYPE 7H7 REPLACING TYPE 6BH7GT

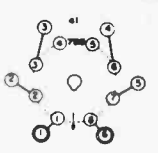
TYPE 7B8 REPLACING TYPE 6BD7
TYPE 14B8 REPLACING TYPE 12BD7



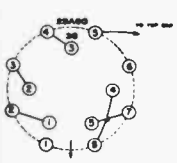
TYPE 6Q7GT REPLACING TYPE 75
TYPE 25L6 REPLACING TYPE 43
TYPE 6K6 / 6V6 / 6F6 / 6U6 REPLACING TYPE 41 / 42



TYPE 7B9 REPLACING TYPE 41 / 42

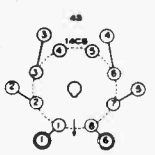


TYPE 38 REPLACING TYPE 25A6G



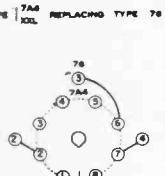
ADD 70 OHMS IN SERIES WITH HEATER IN AC-DC SETS.

TYPE 14C8 REPLACING TYPE 43



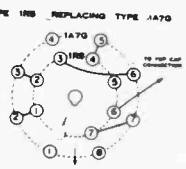
REQUIRES 175 OHMS ACROSS HEATERS IN AC-DC SETS AND 42 OHMS IN SERIES STRING

TYPE 7A8 / 10DL REPLACING TYPE 78



CONVERTERS

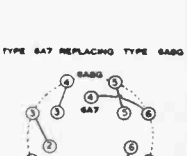
TYPE 1N5 REPLACING TYPE 1A7G



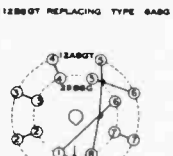
IN SOME LOCATIONS SENSITIVITY MAY BE TOO LOW FOR AVAILABLE SIGNAL STRENGTH

TYPE 6K8G / 6J8G / 6A8G REPLACING TYPE 6A7

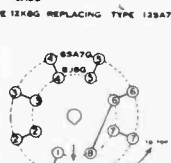
TYPE 6A7 REPLACING TYPE 6A8G



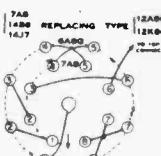
TYPE 12S8GT REPLACING TYPE 12A8GT
TYPE 12S8GT REPLACING TYPE 6A8G



TYPE 6J8G / 6A8G REPLACING TYPE 6SA7GT
TYPE 12K8G REPLACING TYPE 12SA7GT



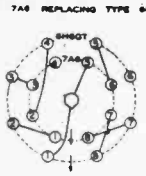
TYPE 7B8 / 7A8* REPLACING TYPE 6A8G / 6J8G / 6K8G
TYPE 7A8 / 14B8 / 14J7 REPLACING TYPE 12A8GT / 12K8G



* REQUIRES 42 TO 80 OHMS ACROSS HEATERS IN AC-DC SETS

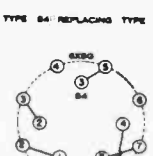
RECTIFIERS

TYPE 7A6 REPLACING TYPE 6H6GT

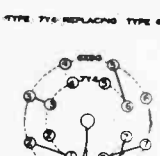


REQUIRES 42 TO 80 OHMS ACROSS HEATERS IN AC-DC SETS

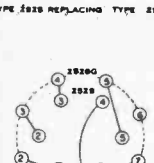
TYPE 84 REPLACING TYPE 6X5G



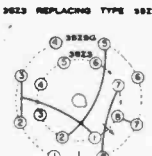
TYPE 7Y4 REPLACING TYPE 6X5G



TYPE 25Z5 REPLACING TYPE 25Z6G



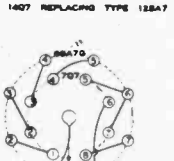
TYPE 35Z5 REPLACING TYPE 35Z5GT-G



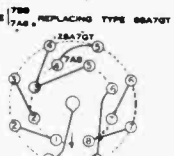
OTHER PROVISION NECESSARY FOR PILOT LAMP

TYPE 7Y4 REPLACING TYPE 84

TYPE 7Q7 REPLACING TYPE 6BA7GT
TYPE 14Q7 REPLACING TYPE 12BA7

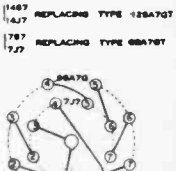


TYPE 7A8 / 14B8 REPLACING TYPE 12BA7GT
TYPE 7B8 / 7A8* REPLACING TYPE 6BA7GT



* REQUIRES 42 TO 80 OHMS ACROSS HEATERS IN AC-DC SETS

TYPE 14Q7 / 14J7 REPLACING TYPE 12BA7GT
TYPE 7B7 / 7J7 REPLACING TYPE 6BA7GT



INNER CIRCLES REPRESENT THE PINS OF THE TYPE OF TUBE AVAILABLE FOR USE IN THE SOCKET WIRED FOR THE TYPE SHOWN AS THE OUTER CIRCLE. THE SOLID LINES SHOW THE WIRING FOR EITHER AN ADAPTOR OR FOR RECONNECTING TO THE SAME OR TO DIFFERENT SOCKETS.

ance of 333 ohms. A 300 ohm resistor will be perfectly satisfactory in this application. Originally the total voltage drop across the tubes was 68.9 volts leaving 48.1 volts drop across the series resistor. In the revised circuit the total voltage drop across the filaments of the tubes for proper operation will now be 93.9 volts. This means, therefore that the series resistor must be reduced in value to approximately 80 ohms in order that 300 ma. will flow through the filament string. This series resistor may be in the form of a line cord or actually may be a resistor mounted in the receiver itself. If it is in the line cord, a resistor of from 150 to 175 ohms may be shunted across the cord provided room may be found to locate this resistor. This resistor will, of course, become quite warm and must be placed in such a position that the added heat from the resistor will not cause wax in condensers to melt. If the resistor is mounted in the receiver to begin with, and if a 75 to 80 ohm resistor of the same physical size can be ob-

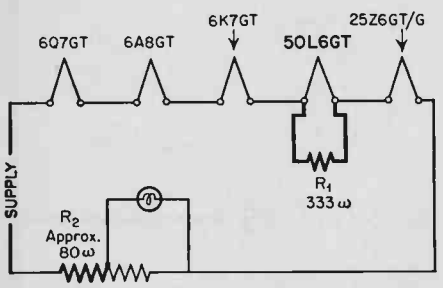


Figure 2.

tained, then it should be substituted for the one which was originally in the receiver.

The same general procedure must be followed if we wish to replace any one of the other tubes in the string with a 150 ma. tube. Fig. 2 illustrates in heavy lines the changes which must be made.

To summarize, there are three things which must be done in making a change of this kind:

1. The filament of the 150 ma. tube must be shunted.
2. The series resistor must be reduced in value so that 300 ma. is still available for the filament string.
3. These resistors must be located in such a place that the added heat will not cause trouble.

$$\text{R1 or R2} = \frac{\text{Sum of tube voltages across resistor}}{.150}$$

$$\text{R3} = \frac{\text{Old tube volts—new tube volts}}{.300}$$

Let us now consider the filament string shown in Fig. 3. A great many more receivers are on the market employing a circuit similar to the one shown. This differs from the circuit shown in Fig. 1 in that no series resistor is employed and that the pilot light is lighted from a tap on the 35Z5GT/G filament.

No series resistor is necessary since the sum of the voltages required across the entire filament string is 122.8 volts. A receiver with such a circuit comes in to be repaired and the 50L6GT has an open filament. As you no doubt have learned, this is probably the most difficult

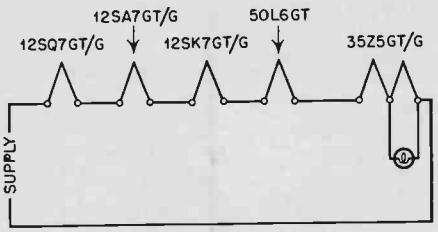


Figure 3.

type of tube to obtain. You find, however, that the jobber does have some 25L6GT/G tubes and assume they are the only power output tubes he has available for series receivers. This tube requires 300 ma. filament current. However, it can be employed provided we rewire the circuit in such a manner that 300 ma. can be supplied to the filament of the 25L6GT/G. This can be accomplished by shunting the three 12-volt tubes with a 250 ohm resistor as shown in Fig. 4 and by shunting the 35Z5GT/G with a 233 ohm resistor (250 ohms would be satisfactory).

The sum of the voltages across all of the filaments now adds up to 97.8 volts, therefore, a series re-

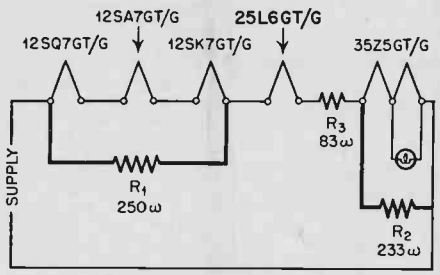


Figure 4.

sistor must be added to the string so that the total will add up to approximately the line voltage. The value of this resistor should be approximately 83 ohms. This resistor may be added at any place in the string but it must be added in such a position that the total 300 ma. flows through that resistor. If the tube which has to be replaced is located at either end of the filament string such as the 35Z5GT/G or the 12SQ7GT/G in Fig. 3, then only one shunting resistor would be required. The biggest problem may very well be to find a place for the three resistors which will be required in most instances.

The power dissipated in these resistors will be considerable and precautions must be observed to prevent the heat developed from causing damage to the receiver. The wattage dissipated by a receiver changed over in the manner indicated in Fig. 4 dissipates twice the wattage that the receiver originally was designed for and all of that heat must be gotten rid of so that permanent damage to condensers and other parts in the receiver will not result. As in Fig. 2, the final changes are indicated in Fig. 4 with heavy lines.

The wattage rating of the resistors required in these circuits is found by multiplying the resistor current in amperes by the voltage across the resistor.

$$W = E \cdot I$$

Thus in the example shown in figures 3 and 4 the watts dissipated in R1 will be

$$37.8 \times .150 = 5.7 \text{ Watts}$$

37.8 comes from 3 tubes at 12.6 volts each, and the .150 amperes is the current through the resistor, another .150 amperes flows through the tubes.

Similarly the watts dissipated in R3 will be

$$25 \times .300 = 7.5 \text{ Watts}$$

The wattage rating of a resistor is the amount it can safely dissipate in the open air.

Unfortunately it is nearly always impossible to place these resistors in the open, and for use in confined spaces, like under the chassis, a factor of safety of at least 2 and preferably 3 is necessary, making the above values 15 and 20 Watts respectively.

To summarize, when a 300 ma. tube is used to replace a 150 ma. tube, there are three things which must be observed:

1. Shunt resistors must be added to the 150 ma. tubes in the receiver so that the tube which is being used as a replacement can obtain its full 300 ma.
2. A series resistor which will carry 300 ma. must be added to restore the voltage distribution across the filament string to its original value.
3. The series and shunt resistors must be placed in such a manner that the additional heat now developed in the receiver will not cause permanent damage.

Obviously there are many changes which may have to be made in equipment other than those indicated but the examples given were chosen as typical ones which you no doubt will have to make in the future. It is hoped that these suggestions will save you time in keeping your customers' receivers in condition.

Tube Substitution Charts

by ENGINEERING DEPARTMENT
SYLVANIA ELECTRIC PRODUCTS, INC.

REQUIRED TYPE	POSSIBLE REPLACEMENTS	NO CHANGES	FIL. VOLTS	FIL. CURRENT	REWIRE SOCKET	CHANGE SOCKET	REALIGN	ADD TOP CAP CONNECTION	REMOVE TOP CAP CONNECTION	CHANGE BIAS OR PLATE VOLTS	NOTE NUMBER
		A	B	C	D	E	F	G	H	K	
6D8G	7A8					E	F		H		
	14J7		B			E	F		H		
	14S7		B			E	F		H		
	14B8		B			E	F		H		
	12A8GT*		B				F				
	12K8G*		B				F				
	25B8G		B		D		F				
9	For 300 MA. types see type 6A8G and for procedure see text.										
6G6G	14A5		B			E				K	2
	35A5		B			E				K	2
	35L6GT*		B							K	2
	50A5		B			E				K	2
	50L6GT*		B							K	2
	50C6G		B							K	2
	For 300 MA. types see type 12A5 and for procedure see text.										
6L5G	12J5GT*		B								
	14A4		B			E					
	14E6		B			E					9
	12J7GT*		B		D			G			4
	12SJ7GT*		B		D						4
	7C7					E					4
	14C7		B			E					4
	6W7G				D			G			4
	For 300 MA. types see type 6C5G and for procedure see text.										
6S7G*	6SS7G*				D		F		H		
	12SK7GT*		B		D		F		H		
	12K7GT*		B				F				
	7B7					E	F		H		6
	14A7/12B7		B			E	F		H		6
	14E7		B			E	F		H		
	14H7		B			E	F		H		6
	12J7GT*		B				F				1
	12SJ7GT*		B		D		F		H		1
	7C7					E	F		H		1
	14C7		B			E	F		H		1–6
	For 300 MA. type see type 6K7G and for procedure see text.										
6T7G	12Q7GT*		B								
	12SQ7GT*		B		D				H		
	7C6					E			H		
	14B6		B			E			H		
	14E7		B			E			H		3
	14R7		B			E			H		3
	12SF7		B		D				H		3
	12C8		B		D						3
	For 300 MA. types see type 6Q7G* and for procedure see text.										
6W7G	12J7GT*		B				F				
	12SJ7GT*		B		D		F		H		
	12SH7		B		D		F		H		6
	7C7					E	F		H		
	14C7		B			E	F		H		
	12C8		B		D		F				9
	14R7		B			E	F		H		9
	For 300 MA. types see 6J7G and for procedure see text.										

REQUIRED TYPE	POSSIBLE REPLACEMENTS	NO CHANGES	FIL. VOLTS	FIL. CURRENT	REWIRE SOCKET	CHANGE SOCKET	REALIGN	ADD TOP CAP CONNECTION	REMOVE TOP CAP CONNECTION	CHANGE BIAS OR PLATE VOLTS	NOTE NUMBER
		A	B	C	D	E	F	G	H	K	
	For use as audio amplifiers types under 6S7G may also be used.										
7A6	12H6G*		B			E					
	14F7		B		D						4
	12SL7GT*		B			E					4
	XXD		B		D						4
	14AF7		B		D						4
	For 300 MA. types see 6H6G and for procedure see text.										
7A8	14B8		B				F				
	14J7		B				F				
	14S7		B				F				
	12A8GT*		B				F	G			
	12K8GT*		B				F	G			
	6D8G					E	F	G			
	25B8GT		B			E	F	G			
	For 300 MA. types see 6A8G and for procedure see text.										
7B7	14A7/12B7		B				F				
	14H7		B				F				6
	6S7G*					E	F	G			
	6SS7G*					E	F				
	12SG7		B			E	F				6
	12SK7G*		B			E	F				
	12K7GT*		B			E	F	G			
	For 300 MA. types see 6K7G and for procedure see text. See also types under 7C7 and note 1.										
7C8	14B6		B								
	6T7G					E		G			
	12Q7GT*		B			E		G			
	12SQ7GT*		B			E					
	For 300 MA. types see 6Q7G and for procedure see text.										
7C7	14C7		B								
	12J7GT*		B			E		G			
	12SJ7GT*		B			E					
	12SH7G*		B			E					6
	6W7G					E		G			
	12C8		B			E		G			9
	14R7		B		D						9
	For 300 MA. types see 6J7G and for procedure see text. For use in audio amplifiers types under 7B7 may also be used.										
12A8GT*	7A8		B			E	F		H		8
	12K8GT*						F				
	6D8G		B				F				
	14B8					E	F		H		8
	14J7					E	F		H		8
	14S7					E	F		H		8
	25B8GT		B		D		F				8
	For 300 MA types see 6A8G and for procedure see text.										
12C8	12SF7				D		F		H	K	
	14E7					E	F		H		
	14R7					E	F		H	K	
	For 300 MA. types see 6B8G and for procedure see text.										

TUBE SUBSTITUTION CHARTS

REQUIRED TYPE	POSSIBLE REPLACEMENTS	NO CHANGES	FIL. VOLTS	FIL. CURRENT	REWIRE SOCKET	CHANGE SOCKET	REALIGN	ADD TOP CAP CONNECTION	REMOVE TOP CAP CONNECTION	CHANGE BIAS OR PLATE VOLTS	NOTE NUMBER
		A	B	C	D	E	F	G	H	K	
12F5GT*	12SF5GT*				D				H		
	12SL7GT*				D				H		9
	6T7G		B		D						9
	12Q7GT*				D						9
	12SQ7GT*				D				H		9
	7C6		B			E			H		9
	14B6					E			H		9
	For 300 MA type see 6F5GT and for procedure see text.										
12J5GT*	6L5G		B								
	14A4					E					
	14E6					E					9
	12J7GT*				D			G			4
	12SJ7GT*				D						4
	7C7		B			E					4
	14C7					E					4
	6W7G		B		D			G			4
	For 300 MA. types see 6J5GT and for procedure see text.										
12J7GT*	12SJ7GT*				D		F		H		
	12SH7G*				D		F		H		6
	6W7G		B				F				
	7C7		B			E	F		H		8
	14C7					E	F		H		8
	12C8				D		F				9
	14R7					E	F		H		9
	For 300 MA. types see 6J7GT and for procedure see text.										
	For use as audio amplifiers types under 12K7G may also be used.										
12K7GT*	12SK7G*				D		F		H		
	12SG7				D		F		H		
	6S7G*		B				F				
	6SS7		B		D		F		H		
	14H7					E	F		H		8–6
	7B7		B			E	F		H		
	14A7/12B7					E	F		H		8
	14E7					E	F		H		9
	25B8GT*		B		D		F				9
	For 300 MA. types see 6K7G and for procedure see text.										
	See also types under 12J7GT and Note 1.										
12K8GT*	7A8		B			E	F		H		8
	12A8G*						F				
	14J7					E	F		H		8
	14S7					E	F		H		
	6D8G		B				F				
	25B8GT*		B		D		F				
	14B8					E	F		H		8
	For 300 MA. types, see type 6K8G and for procedure see text.										
12Q7GT*	12SQ7GT*				D				H		
	6T7G		B								
	7C6		B			E			H		8
	14B6					E			H		8
	14E7					E			H		
	14R7					E			H		
	12SF7				D				H		3
	For 300 MA. types, see type 6Q7G for procedure see text.										
12SA7GT*	14Q7					E	F				8
	14B8					E	F				8
	14J7					E	F				8
	14S7					E	F				8
	12A8GT*				D		F	G			
	6D8G		B		D		F	G			
	7A8		B			E	F				8
	12K8GT*				D		F	G			8
	For 300 MA. types see type 6SA7 and for procedure see text.										
12SF5GT*	12F5GT*				D			G			
	12Q7GT*				D			G			
	12SQ7GT*				D						
	12SL7GT				D						
	6T7G		B		D			G			
	7C6		B			E					
	14B6					E					
	For 300 MA. types see type 6SF5 and for procedure see text.										
12SJ7GT*	12SH7G*						F				
	12J7GT*				D		F	G			
	6W7G		B		D		F	G			
	7C7		B			E	F				8
	14C7					E	F				8
	12C8				D		F	G			
	14R7					E	F				8
	For use in audio amplifiers types under 12SK7G may also be used.										
	For 300 MA. types see type 6SJ7G and for procedure see text.										
12SK7GT*	12K7GT*				D		F	G			
	6S7G*		B				F	G			
	12SG7						F				8
	6SS7		B				F				
	7B7		B			E	F				
	14H7					E	F				8
	12B7/14A7					E	F				8
	14E7					E	F				
	See also types under 12SJ7 and Note 1.										
	For 300 MA. types see type 6K7G and for procedure see text.										
12SQ7GT*	12Q7GT*				D			G			
	6T7G		B		D			G			
	7C6		B			E					
	14B6					E					8
	14E7					E					
	14R7					E					
	12SF7					E					3
	For 300 MA. types see type 6Q7GT and for procedure see text.										
12SR7*	6ST7*		B								
	14E6					E					
	12SF7					E					4
	12C8					E		G			4
	For 300 MA. types see Type 6R7G and for procedure see text.										
14A4	14E6				D						9
	12J5GT*					E					
	6L5G					E					
	6ST7		B			E					
	12SR7		B			E					
	For 300 MA types see type 6J5G and for procedure see text.										
14A5	35A5		B							K	2
	50A5		B							K	2
	6G6G		B			E				K	2
	50C6G		B			E				K	2
	35L6GT*		B			E				K	2
	50L6GT*		B			E				K	2
	12A6					E					
	For 300 MA. types see type 12A5 and for procedure see text.										

TUBE SUBSTITUTION CHARTS

REQUIRED TYPE	POSSIBLE REPLACEMENTS	NO CHANGES	FIL. VOLTS	FIL. CURRENT	REWIRE SOCKET	CHANGE SOCKET	REALIGN	ADD TOP CAP CONNECTION	REMOVE TOP CAP CONNECTION	CHANGE BIAS OR PLATE VOLTS	NOTE NUMBER
		A	B	C	D	E	F	G	H	K	
14A7/12B7	7B7		B				F				
	14H7						F				6
	6S7G*		B			E	F	G			
	6SS7		B			E	F				
	12SK7GT*					E	F				
	12SG7					E	F				6
	12K7GT*					E	F	G			
	For 300 MA. types see type 6K7G and for procedure see text.										
14B6	7C6		B								
	6T7G		B			E		G			
	12SQ7GT*					E					
	12Q7GT*					E		G			
	12SF7					E					3
	12C8					E		G			3
	For 300 MA. types see type 6Q7G and for procedure see text.										
14B8	7A8		B				F				
	14J7						F				
	14S7						F				
	12A8GT*					E	F	G			
	12K8GT*					E	F	G			
	25B8GT*		B			E	F	G			
	6D8G		B			E	F	G			
	For 300 MA. types see type 6A8G and for procedure see text.										
14C7	7C7		B								
	6W7G		B			E		G			
	12SI7GT*					E					
	12J7GT*					E					
	12SH7					E					6
	For use as audio amplifiers see also types under 14A7.										
	For 300 MA. types see type 6J7G and for procedure see text.										
14E6	12SR7					E					
	6ST7		B			E					
	12SF7					E					4
	12C8					E		G			4
	For 300 MA. types see type 6V7G and for procedure see text.										
14J7	14B8						F				
	14S7						F				
	7A8		B				F				
	6D8G		B			E		G			
	12A8GT*					E	F	G			
	12K8GT*					E	F	G			
	12B8GT*					E	F	G			
	For 300 MA. types see type 6A8G and for procedure see text.										
14Q7	12SA7GT*					E	F				
	14B8				D		F				
	14J7				D		F				
	14S7				D		F				
	12A8GT*					E	F	G			
	6D8G		B			E	F	G			
	7A8		B		D		F				
	12K8GT*					E	F	G			
	For 300 MA. types see type 6SA7 and for procedure see text.										
14R7	14E7									K	
	12SF7					E				K	
	12C8					E		G		K	
	For 300 MA. types see type 6B8G and for procedure see text.										

REQUIRED TYPE	POSSIBLE REPLACEMENTS	NO CHANGES	FIL. VOLTS	FIL. CURRENT	REWIRE SOCKET	CHANGE SOCKET	REALIGN	ADD TOP CAP CONNECTION	REMOVE TOP CAP CONNECTION	CHANGE BIAS OR PLATE VOLTS	NOTE NUMBER
		A	B	C	D	E	F	G	H	K	
25B8GT*	No good single tube; types 12SF5 and 12K7G together.										
	12B8GT*		B	C			F				
	6P7G		B	C	D		F			K	
	6F7		B	C		E	F			K	
35A5	50A5		B								
	14A5		B							K	2
	12A6		B			E				K	2
	50C6G		B			E				K	
	35L6GT*					E					
	50L6GT*		B			E					
	70L7GT		B			E					9
	For 300 MA. types see type 25L6G and for procedure see text.										
35L6GT*	50L6GT*		B								
	70L7GT*		B		D						9
	50C6G		B								
	12A6		B							K	2
	14A5		B			E				K	2
	35A5					E					8
	50A5		B			E					
	For 300 MA. types see type 25L6G and for procedure see text.										
35Y4	35Z5GT*					E					
	35Z3				D						10
	45Z5GT*		B			E					
	50Y6GT*		B			E					10
	50Z7G		B			E					
	40Z5		B			E					10
	45Z3		B	C		E					10
	70L7GT		B			E					9–10
	35Z4GT*					E					10
	For 300 MA. types see type 12Z3 and for procedure see text.										
35Z3	35Y4				D						
	35Z5GT*					E					
	45Z5GT*		B			E					
	50Y6GT		B			E					
	50Z7GT		B			E					
	40Z5		B			E					
	45Z3		B	C		E					
	70L7GT		B			E					9
	35Z4GT*					E					
35Z4GT*	35Z5GT*				D						
	45Z5GT*		B		D						
	35Z3					E					
	35Y4					E					
	50Y6GT		B		D						
	50Z7GT		B		D						
	40Z5		B			E					
	45Z5G*		B		D						
	70L7GT		B		D						9
	45Z3		B	C		E					
35Z5GT*	45Z5GT*		B								
	35Z4GT*										10
	35Z3					E					8–10
	35Y4					E					
	50Y6GT		B		D						10
	50Z7GT		B		D						
	40Z5		B								
	45Z3		B	C		E					10
	70L7GT		B								9–10
	For 300 MA. types see type 12Z3 and for procedure see text.										
40Z5	35Z5GT*	A									
45Z5GT*	35Z3		B								
			B			E					10

TUBE SUBSTITUTION CHARTS

REQUIRED TYPE	POSSIBLE REPLACEMENTS	NO CHANGES A	FIL VOLTS B	FIL. CURRENT B	REWIRE SOCKET C	CHANGE SOCKET D	REALIGN E	ADD TOP CAP CONNECTION F	REMOVE TOP CAP CONNECTION G	CHANGE BIAS OR PLATE VOLTS H	NOTE NUMBER K
	35Y4		B				E				
	35Z4GT*		B			D					10
	50Y6GT		B			D					10
	50Z7GT		B			D					10
	45Z3				C		E				10
	70L7GT		B			D					10
50A5	35A5		B								
	14A5		B							K	
	12A6		B				E			K	
	50C6G						E				
	35L6GT*		B				E				
	50L6GT*						E				
	70L7GT*		B				E				10
	For 300 MA. types see type 25L6G and for procedure see text.										
50C6G	35L6GT*		B							K	
	50L6GT*									K	
	70L7GT*		B			D				K	10
	12A6		B							K	
	14A5		B				E			K	
	35A5		B				E			K	
	50A5						E			K	
	For 300 MA. types see type 25C6G and for procedure see text.										
50L6GT*	50C6G									K	
	35L6GT*		B								
	70L7GT*		B			D					
	12A6		B							K	2
	14A5		B				E			K	2
	35A5		B				E				
	50A5						E				8
	For 300 MA. types see type 25L6GT and for procedure see text.										
50Y6GT	117Z6GT*		B	C							
	50Z7G					D					
	70L7G					D					4
	For 300 MA. types see type 25Z6 and for procedure see text.										
	When used as a half-wave rectifier the following will substitute.										
	35Z3		B				E				
	35Z4GT*		B			D					
	35Z5GT*		B			D					
	45Z5GT*					D					
	35Y4		B				E				
	70L7GT*		B			D					9
50Z7G	50Y6GT*		B			D					10
	70L7GT*		B	C		D					4–10
	117Z6GT		B	C		D					10
	See also type 50Y6GT above.										
70L7GT*	70A7GT					D					
	117P7GT*		B	C		D				K	2
	117N7GT*		B	C		D					2
	117L7/M7GT		B	C		D					2
XXD	14AF7	A									
	14F7									K	
	12SL7GT						E			K	
	12AH7GT						E				
	12SC7						E			K	

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 heater voltage on the substitute tube is different from the required type. In most cases this can be taken care of by changing or shorting out a section of the series resistor. In cases where the resistor is in the line cord this is difficult unless the total voltage can be increased enough to make a line resistor unnecessary.

C. Indicates that the heater current of the substitute tube is different from the desired tube and that parallel resistors must be used as explained in the article which precedes these charts.

D. In these cases the tube socket is the same but some rearrangement of the connections may be necessary. It may only be necessary to be sure that contacts connected to elements of the substitute tube which are not required in that circuit are not used as tie points.

E. Requires a different type of 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 tubes. Self bias circuits give some automatic correction but this should be measured and changed if necessary to prevent early failures.

1. The use of a sharp cut-off pentode in place of a remote cut-off tube may cause great distortion in locations when strong signals are available. If no other substitute can be found 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 or volume 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 actual plate volts.

4. This type can be used as a triode by tying screen and suppressor to the plate. As a rectifier tie all grids to plate.

5. This substitute satisfactory only if cathodes of the two diodes are tied together.

6. Screen voltage should be decreased to prevent oscillation with this higher gm tube.

7. Screen voltage may be increased for this type.

8. Circuit for this substitution is given on last few pages of this booklet.

9. Unused elements should be connected to chassis or cathode terminal.

10. Pilot lamp may be omitted or provided for by other means.

** The G, GT, GT/G or metal types may be used interchangeably where space and shielding requirements permit. Realignment may be required to allow for differences in capacity*

SYLVANIA NEWS
RADIO RETAILER EDITION

NOVEMBER *Published in the Interest of Better Sight and Sound* 1944

HUNDREDS OF PRIZES FOR RADIO RETAILERS

6th War Bond Drive Keyed to Pacific War

The coming 6th War Bond Drive will be geared primarily to the task facing us in the Pacific, according to Ted Gamble, National Director of the War Finance Division, U. S. Treasury.

"The job of the 6th War Loan," he told the merchant leaders, display experts and press representatives assembled at a luncheon sponsored by the War Advertising Council, "is to sell the war all over again to the people."

Charles W. Alexander, originator of the display plan, stressed the fact that the display contest was designed to give the participants maximum honor, prestige, and prizes.

CONTEST RULES

1. Only displays devoted exclusively to the Sixth War Bond Drive will be considered. And each display must feature a $100 War Bond, or *reproduction thereof.*

2. Photographs of displays should be marked "RADIO DIVISION" on reverse side, followed by the name of the contestant, name and address of the store, dates when and place where the display was on view to the public. Send only photos of displays – not display material.

3. Photographs should be 8" x 10" glossy prints. They may be photographs of a single display, or of a group (in which case, they should be joined together).

4. All photographs become the property of the Contest Committee and will be presented to the U. S. Treasury for its use.

5. Displays will be judged according to sales appeal, originality, attention-value and artistry.

6. All entries are to be mailed to the Sixth War Bond Display Contest, care DISPLAY WORLD, Cincinnati 1, Ohio. The closing date is December 26, and entries must bear a postmark no later than midnight of that date.

Sylvania Sponsors War Bond Display Contest $1000—TOP PRIZE

Hundreds of Radio Service Shops and Radio Retailers from Coast to Coast will have the opportunity to win War Bond prizes totalling $10,500 maturity value, through the Sylvania-sponsored 6th War Loan window display contest. Confined to radio outlets—*and radio outlets only*—the chance of winning will be unusually high for every entrant. What is more, every entrant automatically qualifies for a *state*, *regional* and *national* prize.

JUDGES NAMED TO PICK WINNERS

Panels of judges are being chosen for each state, section, district, and for the nation. The panel will always include one representative of an advertising association, the advertising manager of a concern not competing, a public spirited citizen, a newspaper editor, and a commercial artist.

As the judges will have to make their decision according to what they see on the photographs submitted, Sylvania urges contestants to submit clear, sharp prints.

Ideas Count

Your window may be large or small; your shop may be on the main thoroughfare or a side street but to the judges the decision will be based on the cleverness of the idea and the ingenuity with which it is carried out.

Remember one thing—the window display is to be designed to *sell War Bonds*—not to advertise your services or Sylvania Electric Products, Inc. The more bond selling force you build into your window display, the more chance you have of walking off with one of the really big money prizes.

Who gets the Thousand Dollars

Some radio man is going to get himself a $1000 War Bond. Hundreds of others will get smaller ones. Details are not all complete but write *today* to Sylvania, Emporium, Pa., and get in line for some real dough.

Sylvania will announce complete details of the contest to all dealers and servicemen by means of special mailings.

SYLVANIA ELECTRIC PRODUCTS INC.
Radio Division · Emporium, Pa.

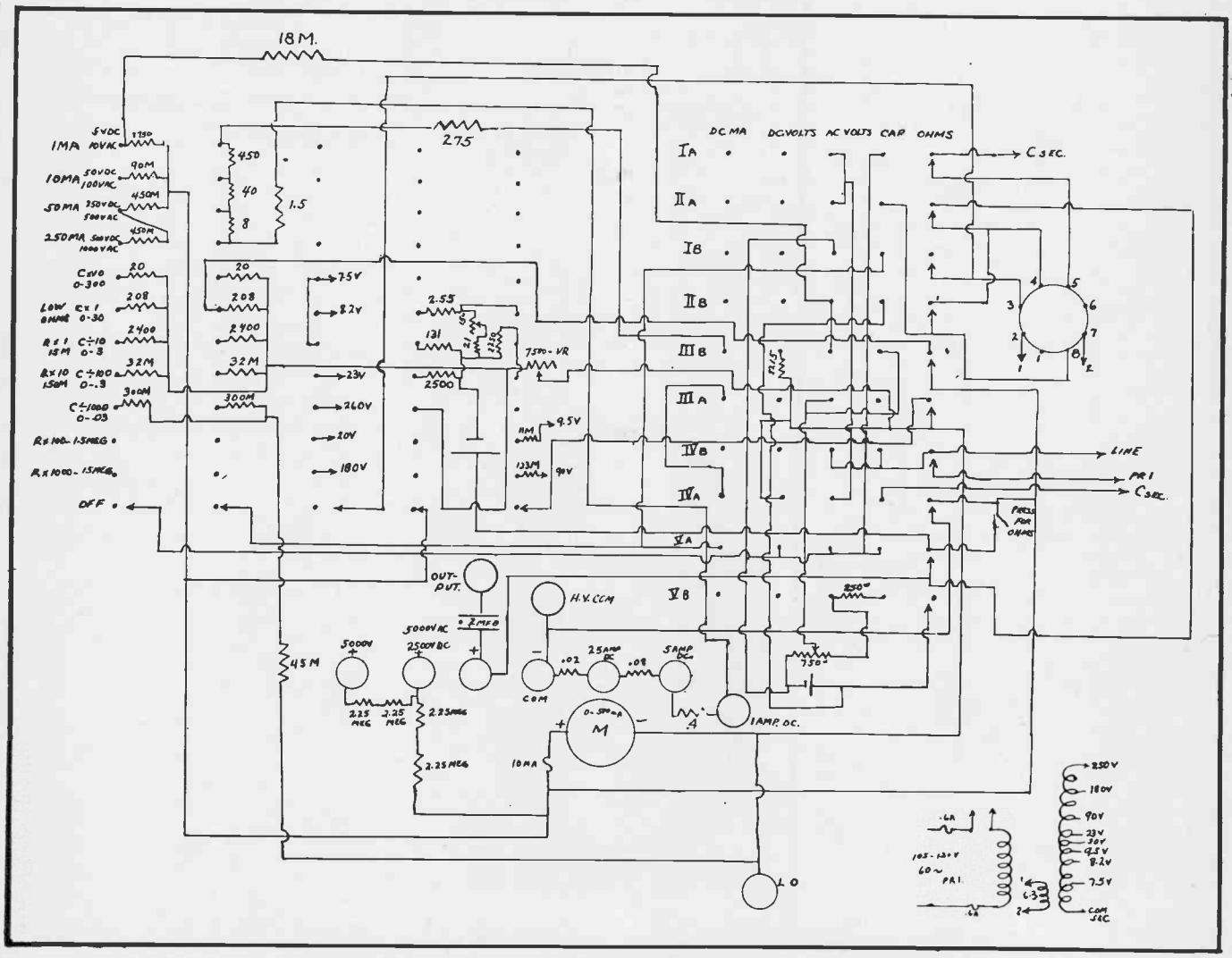
MAKERS OF FLUORESCENT LAMPS, FIXTURES, ACCESSORIES, INCANDESCENT LAMPS, RADIO TUBES, CATHODE RAY TUBES, ELECTRONIC DEVICES

Technical Service Portfolio

SECTION XLIII

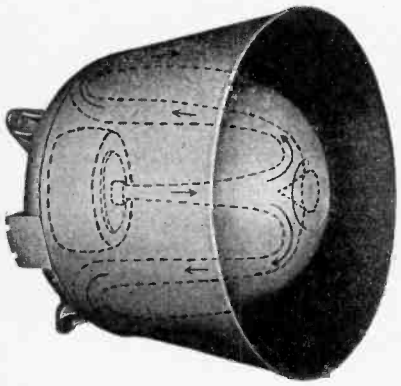
TEST EQUIPMENT CIRCUITS—Part 3

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.



Radio City Products Co. Model 419 (Improved 414) Multi-Tester

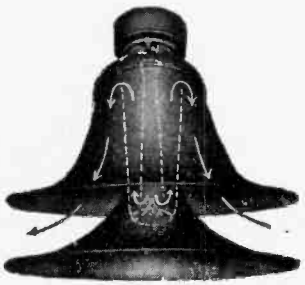
A Safe Bet for Steady Sales



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

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

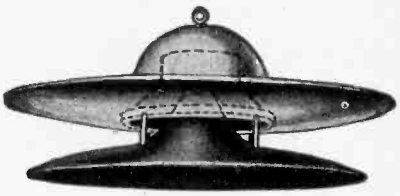
Left—RADIAL HORN SPEAKER; a 3½′ re-entrant type horn. Projects sound over 360° area. Storm-proof. Made of RACON Acoustic Material to prevent resonant effects.



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

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

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



SEND FOR CATALOG

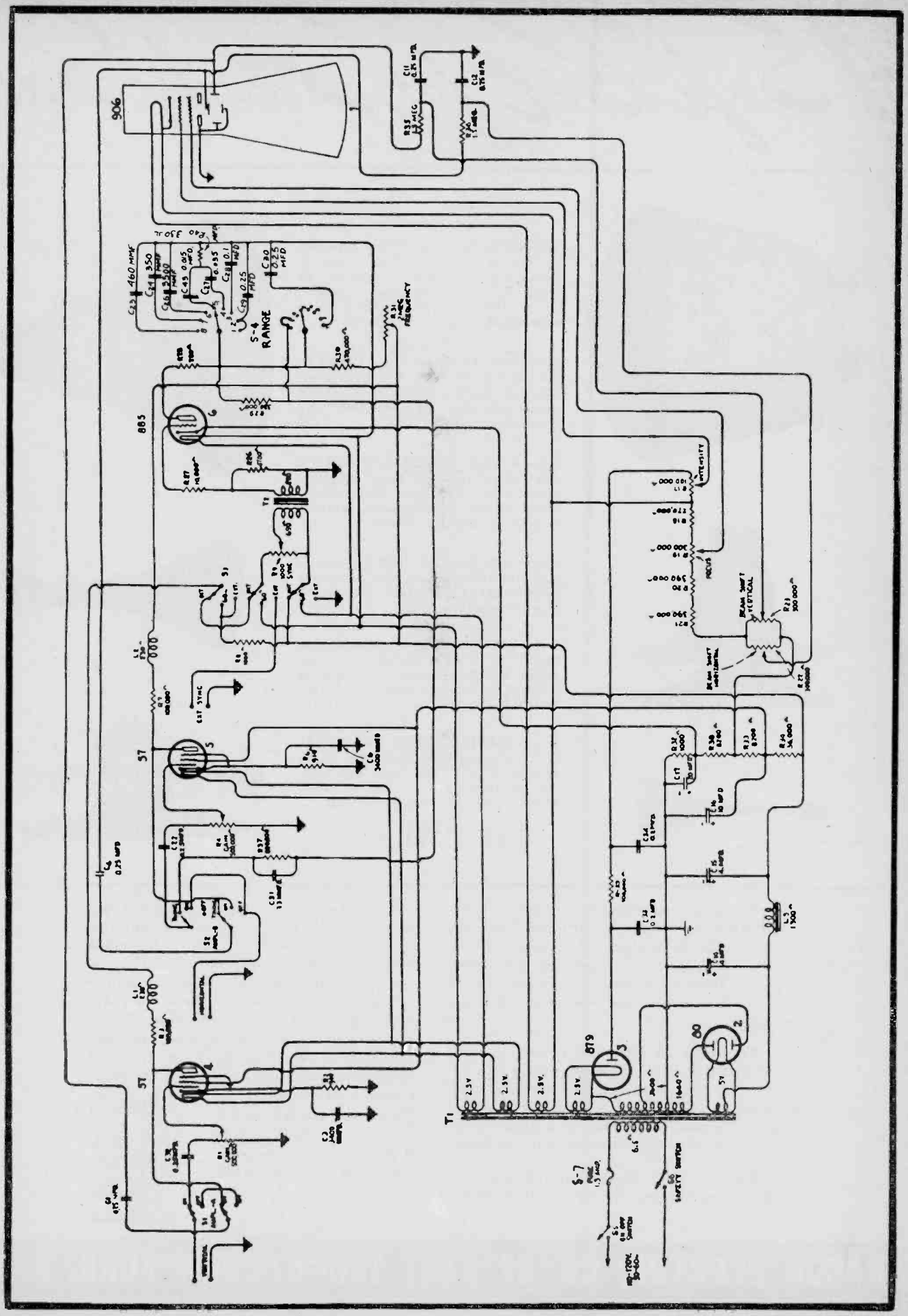
RACON, pioneer and world's largest manufacturer of loudspeakers, horns and driving units, is working at capacity filling diversified orders — speakers for Army, Navy, Maritime Commission, Signal Corps, etc. and industrial use. Now we are planning ahead.

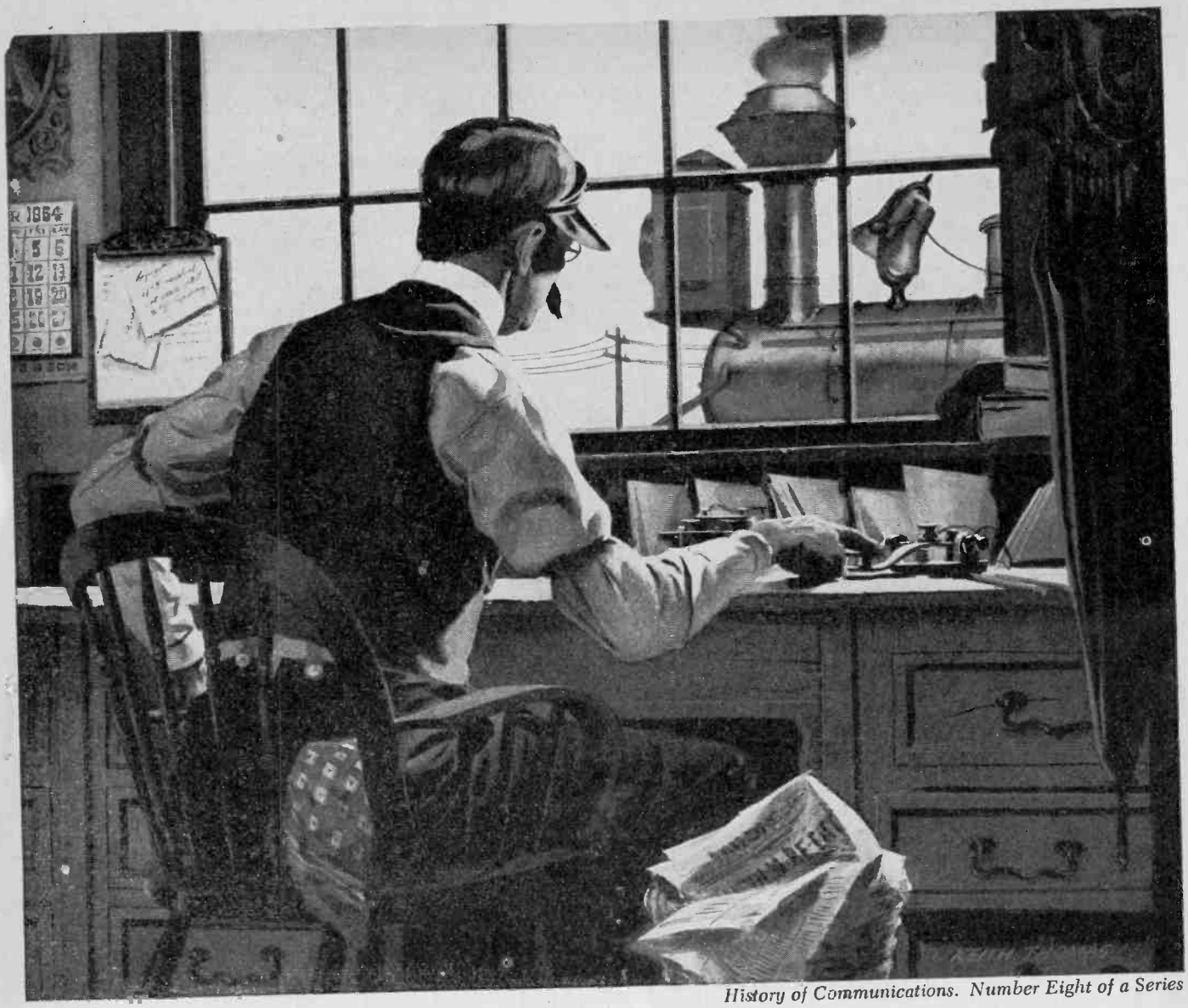
Practically all industrial firms are users, or potential users of some type public-address, paging or sound distribution system. Statistics prove that a properly planned sound system installation is a good investment which in time generally pays for itself.

RACONS have always enjoyed a steady, high sales volume. We believe they always will, for our products are the finest that money can buy, or engineering skill produce. Receiver units supplied with either metal or plastic diaphragms. RACON products generally cost less than competitive brands because a lower power-rated and lower-priced RACON will outperform higher power-rated units of other make. In other words, don't let catalog list-prices fool you. Basic costs and rated outputs are the prime factors worth considering. That's why leading soundmen prefer and specify RACONS, they are dependable—a safe bet for steady sales and satisfied users.

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

Radio Corporation of America Cathode Ray Oscilloscope (Type 122-B)





History of Communications. Number Eight of a Series

EARLY RAILROAD COMMUNICATIONS BY TELEGRAPH

Communication by telegraph was probably one of the first of the electronic arts which met with commercial success in America. Of constant interest to every boy in a small town, the telegrapher down at the depot was a hero – a man of great science. With the advent of faster locomotives, telegraphy was a speedy method of traffic control.

Today, and for the postwar period, the picture will include electronic voice communications for the streamlined trains which travel one hundred miles per hour. There must be a more flexible control via electronics, plus the added possibility of passenger luxury in radio telephones. Universal stands ready as an electronic manufacturer to serve in the era of applied electronics.

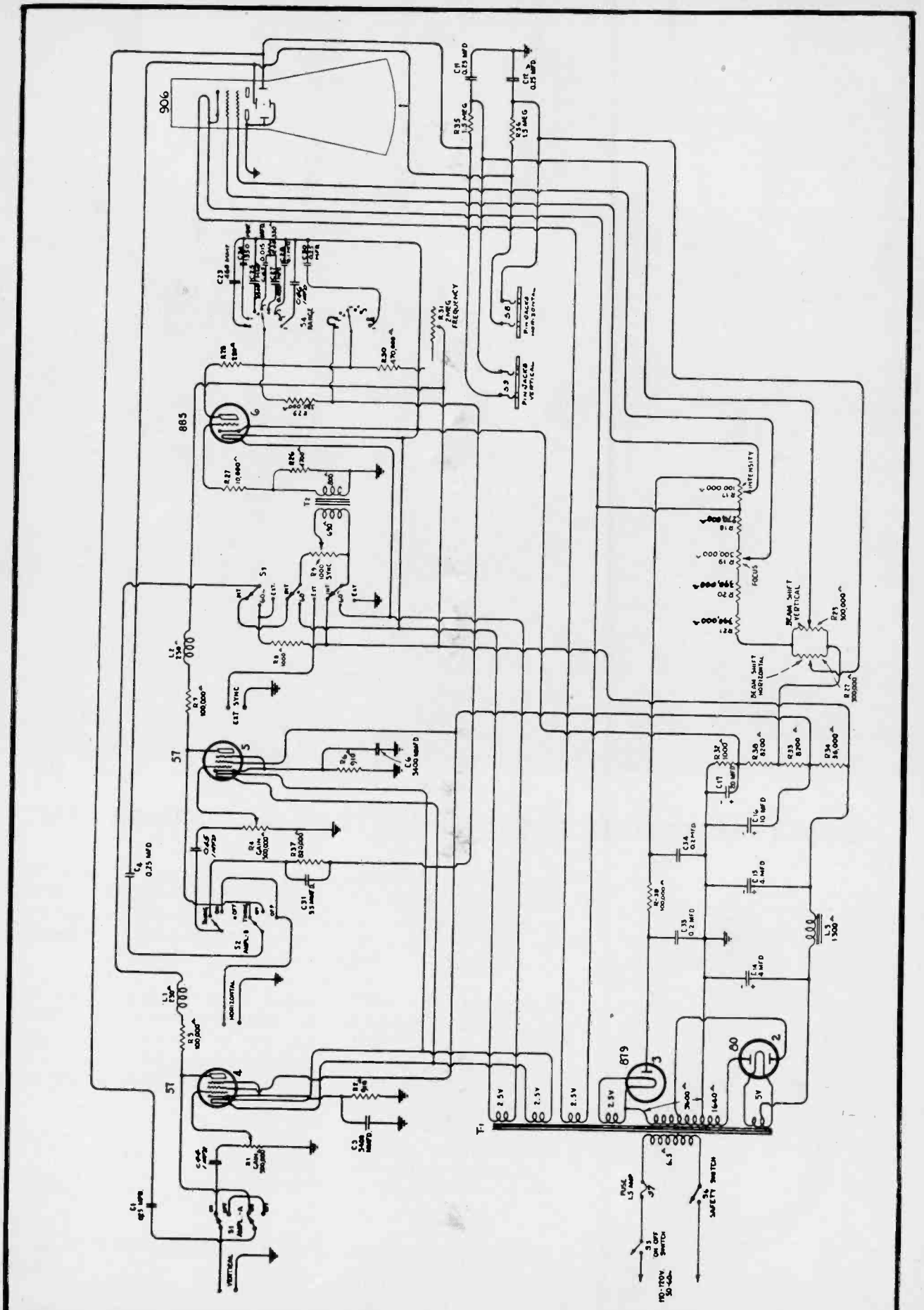
< Model 1700-UB, illustrated at left, is but one of several military type microphones now available to priority users through local radio jobbers.

UNIVERSAL MICROPHONE COMPANY

INGLEWOOD, CALIFORNIA

FOREIGN DIVISION: 301 CLAY STREET, SAN FRANCISCO 11, CALIFORNIA · CANADIAN DIVISION: 560 KING STREET WEST, TORONTO 1, ONTARIO, CANADA

Radio Corporation of America Cathode Ray Oscilloscope (Type TMV 122-D)



A REVIEW of the Electronic Parts & Equipment Industry CONFERENCE

by **SANFORD R. COWAN**
EDITOR

WHEN the Electronic Parts & Equipment Industry Conference opened on October 19th at Chicago, practically every manufacturer, representative and distributor was present. In round figures there were five hundred men from each group, or a total of fifteen hundred.

The author feels the Conference was a terrific success, if only because of George D. Barbey's swansong speech on the subject of distributor-service dealer strained relationships. But, the reader will find that covered in a following paragraph.

Jobbers Feared Parts Shortage

Distributors—(more than 60% of the NEDA membership attended)—were primarily interested in trying to ascertain whether or not parts manufacturers will provide for their needs when V-Day comes. It was feared that many parts manufacturers might be tempted to neglect the replacement parts field, come V-Day, in a mad scramble to get a share of the vast new-equipment business. (New-equipment business meaning parts sold to receiver manufacturers for assembly in new sets). Distributors' fears in this regard were dispelled as the reliable, old, established replacement parts manufacturers gave pledges that their jobbers' needs will not be overlooked.

Convention attenders were pleasantly surprised to note that many new manufacturers (at least new to radio distributors), contracted for booths and were all set to sign up new outlets. Appreciation of the vast post-war potentialities undoubtedly brought out the newcomers. Of course, distributors seeking new lines and sources of supply literally swamped all exhibitors. The conference periods of two to three hours daily were far too short. In a word, business at the show hummed, transactions being contingent upon war orders getting priority.

George D. Barbey, who retired as president of NEDA. Photo of new president, W. O. Schoning, came too late to show.

The Speakers Said:

At the first luncheon-meeting, Arthur "Red" Motley, publisher of *American Magazine* spoke on "Postwar Selling." So dynamic and forceful was this speech that most listeners appreciated, for the first time perhaps, the true meaning of advertising and planned merchandising as contrasted with passive selling because there is a great demand. It was stressed that standard, advertised brands are easier to sell, afford greater profit margin and are conducive to increasing repeat business.

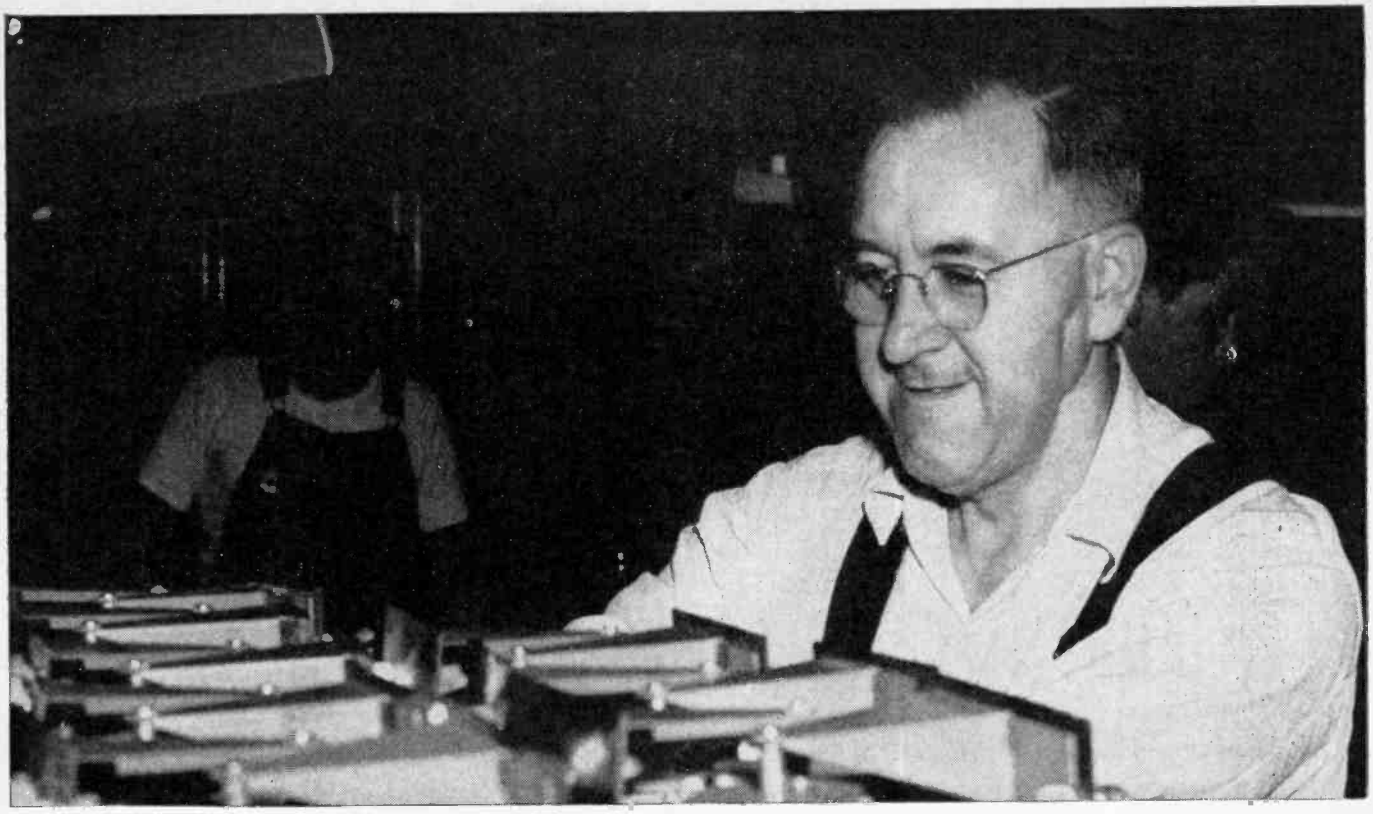
The second luncheon-meeting's speaker, Edward Butler of P. R. Mallory & Co., Inc., described a "Check-sheet for Post-War Planing." Here again, in a forceful manner, it became apparent that sound merchandising and planning must be incorporated now in the scheme of things if businessmen hope for a successful growth in the hectic days ahead.

The concluding luncheon speaker, Dr. W. R. G. Baker, a vice-president of General Electric Company, talked on "Electronics." He must have startled his audience when, for the first time, he, as an authority on the subject, blandly admitted that too much glamor and wishful thinking by zealots has been attached to the subject of electronics. The art has its potentialities and objectives, said the doctor, but many have been led to believe that everything can be done, and everything should be done by some electronic application, which, of course, is entirely unsound and unwarranted.

Barbey's Bombshell

From a service dealer's viewpoint, two statements by George D. Barbey, retiring president of NEDA, addressing distributors wrapped up the whole show. How some of the jobbers squirmed when the shoe pinched was a pleasant sight. Said Mr. Barbey, " . . . too many of you kept your tube allotments for over-the-counter sales . . ." and, ". . . it is about time for you to realize that you ought to be either in the wholesale business, or the retail business, and, 'Never The Twain Shall Meet' ". (RSD readers know that this distressing condition has long been a prime plank in our editorial platform. We offer a deep bow of appreciation to Mr. Barbey for recogniz-

(Continued on page 34)



MEN OF MEISSNER

...ON THEIR FACES ARE THE SMILES OF PRIDE IN WORK WELL DONE

In the little city of Mt. Carmel, Illinois — famous for music and electronics — the men of the Meissner Manufacturing Company are now devoting their skill and experience to speeding the final day of Victory. All were hand-picked for their jobs — many "grew-up" in the business, doing their share toward making the name Meissner stand for the ultimate in radio quality. They have had the pleasure of turning out perfect work — felt the thrill and satisfaction that comes with achievement. And in the bright, post-war world of tomorrow, it will be these same men of Meissner that add new fame to the name of Meissner radio and other electronic equipment.

Skill PLUS "Know How" — The secret of Meissner's reputation for superb quality precision work is more than just great skill and intricate machines. It is a combination of these two, PLUS the "know how" that comes only from years of experience.

Expert—His is a heritage for producing far-famed quality. Mt. Carmel, Illinois, is said to have more electronic technicians per thousand population than any other city in America.

Meissner's Precision-el—that's the name earned by the Meissner personnel for their skill, and for the pride they have taken in doing their precision work right.

MEISSNER MANUFACTURING COMPANY • MT. CARMEL, ILL.

ADVANCED ELECTRONIC RESEARCH AND MANUFACTURE

Export Division: 25 Warren Street, New York; *Cable,* Simontrice, New York

CONFERENCE

(from page 32)

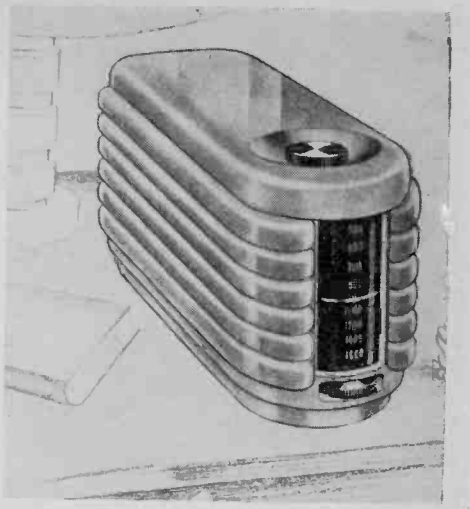
ing an industry evil, and for supporting our efforts.—ED.).

The newly elected officers of NEDA are: President: W. O. Schoning; Vice-Pres., A. D. Davis; Sec'y-Treas., A. Lippman. Directors: H. M. Carpenter, M. L. Deutschmann, L. W. Hatry, L. Miller, S. Poncher, A. C. Stallman, E. Wilkinson, W. A. Wilson and S. Zionts. (It is hoped that these gentlemen will peruse the editorial "Time to Collaborate" appearing in this issue).

Concluding notes: a vast number of surplus merchandise venders present at Chicago were hoping to garner any available military rejects, or excess parts. Distributors would do wisely to squeeze the squirts out, for if perchance some of this merchandise would turn up in service shops it may lead to a flood of repaired-set breakdowns.

Television Broadcasters Conference

The first annual conference of the Television Broadcasters Association will be held in New York, December 11-12, at the Hotel Commodore. It is intended to bring together persons and organizations from all fields sharing interest in the progress of television—broadcasters, manufacturers, advertisers, advertising agencies, production concerns, motion picture makers, electronics engineers, etc. Applications for attendance can be had by addressing Dr. Allen B. DuMont, president of the association, 500 Fifth Ave., New York 18, N. Y.



One of 17 models shown at the Chicago Conference — a four-tube superhet plastic job, standard broadcast.

Meck Shows New Radio Line, Describes "Preferential Distributors Plan"

The John Meck Industries of Plymouth, Indiana, introduced the 194X line of radios and phonographs to radio parts jobbers from all sections of the country and a number of foreign countries, at the National Electronic Parts Distributors Conference, Chicago, October 19, 20 and 21. John Meck, president, was, in his own words, "overwhelmed at the enthusiasm displayed by the jobbers. We expected a large attendance at our showing, but when I say that the turnout exceeded our fondest hopes, I put it very mildly."

W. W. Montgomery, sales manager, outlined to the jobbers the new and original Meck "Preferential Distributors Plan" which guarantees deliveries to jobbers of their first year's radio requirements. Mr. Montgomery said, "This Preferential Distributors Plan is as new as it is unusual. We believe that most radio jobbers face the postwar era with the knowledge that they will not be able to secure the radios they will require to supply their customer's needs. Under our plan Meck jobbers estimate the number of radios they will require during the first postwar year, place their order for their first two months' requirements and they are guaranteed the balance of their estimated yearly requirements. When the entire production of the Meck factory has been allocated, no additional distributors will be signed up. We believe it better to provide fewer Meck jobbers with all the radios they require for profitable operation, than to add so many that each will receive only a few of the radios they require."

The Meck line includes table models, table radio-combinations, console combination, portables and farm sets in addition to three phonograph models. Illustrations of 17 models were shown. (See illustration on page 16.)

Distribution of Meck radios and phonographs will be secured through radio equipment jobbers exclusively, and the jobbers already appointed are out in their territory offering dealers guaranteed deliveries of their Meck radio requirements under the "Preferential Dealer Plan."

SPRAGUE TRADING POST

A FREE Buy-Exchange-Sell Service for Radio Men

URGENTLY NEEDED—25Z5 tube. Morton Bardfield, 4 Brinsley St., Dorchester 21, Mass.

FOR SALE OR TRADE—35-watt amplifier, 2 mike inputs, 1 phono input, complete with tubes and desk-type crystal mike. Want test equipment. Glen C. Ridgway, 4914 E. 31st St., Kansas City, Mo.

SELLING OUT—155 tubes in cartons; 20 slightly used tubes; mike velocity and amp. "Lobe" condenser tester, $10. W. P. Pombriant, Radio Service Laboratory, 75 Birch St., Biddeford, Maine.

WILL TRADE—Readrite #730A point-to-point tester and Triplett #666H AC-DC pocket V-O-M for a good 8mm. movie projector. Theodore Van Dongen, 6051 Manistique, Detroit 24, Mich.

FOR SALE—#185 Clough-Brengle unimeter, $40; 12K7, 22, 6A6, and 6L6 tubes, list. C. M. Williams, 551 Putnam Ave., Zanesville, Ohio.

FOR SALE OR TRADE—24A and 47 tubes, almost new—test perfect. Urgently need sig. generator, multitester, and 0-1 milliameter. Jack W. Streater, 68 W. Marshall, Lansdowne, Pa.

WILL TRADE—Latest model Underwood portable typewriter; K & E LogLog Duplex decitrig slide rule and case; and B & S micrometer, 13RS, 0 to 1 inch, for new and used tubes. S. L. Pearl, 558 Parkside Ave., Brooklyn 26, N. Y.

FOR SALE—Candler system of touch typewriting, $3.50. Morris Dorsey, 442 Cherokee Ave., S.E., Atlanta, Ga.

WANTED—Rider's Manuals 1 to 5 (abridged); also vibrater tester and auto radio "A" power units. Smith's Radio Lab., 705 Croton Ave., New Castle, Pa.

FOR SALE—Altec-Lansing speaker, in modernistic cabinet; Hallicrafter's S-31 AM-FM tuner; Bogen 25-watt amplifier with tone expansion; and Webster-Rauland phono changer. All A-1 with tubes. Lessere, 28 Beekman Place, New York City.

WANTED—Tube checker, preferably Superior #1240, Radio City 309P or Readrite #432A. Don Morton, 2012 N. 23rd Place, Phoenix, Arizona.

FOR SALE OR TRADE—Variable condensers, r-f chokes, Hammerlund five-prong isolantite socket, adjustable phono-oscillator coil, and National vernier dial. Want RCA crystal pickup #9868, or crystal cartridge. James S. Messler, 835 Berkeley Ave., Trenton 8, N. J.

WANTED—Late edition Sprayberry or NRI complete radio course. Albert Spector, 178 Cornell St., Roslindale 31, Mass.

URGENTLY NEEDED—NRI Triplett portable laboratory #1775-B, and Rider manuals 2 and 9. Burton's Radio and Paint Shop, 109 West Market St., Fayetteville, Tenn.

WANTED—Radio tubes and parts. Raymond Lewis, 722 N. Shedwick St., Philadelphia, Pa.

WANTED—20-30 watt portable, P.A. amplifier with 2 speakers, and multimeter. W. E. Schutz, McLaughlin, S. Dak.

FOR SALE—"Knight" 20 watt HI-FI phono-amplifier, practically new, with built-in automatic volume expansion, complete with 15" HI-FI coaxial Jensen speaker #JHP52, $75. R. M. Jachman, 626 Thomas Ave., Forest Park, Ill.

WANTED—Rider manuals, series 7 to 12, 6-45v. portable "B" batteries, (standard "B" batteries suitable), and 2-4½v. "C" batteries. M. Chattinger, 3546 E. Canfield, Detroit 7, Mich.

URGENTLY NEEDED—Sig. generator, inexpensive model in good condition. Lester Garber, R.R. 1, Box 52, Eureka, Ill.

FOR SALE—Complete radio equipment, stock and business—including all-wave oscillators, multimeters, radios, four P.A. systems with mikes and speakers, new parts, tubes, filters, etc. Plenty of sets in community—radius of 75 miles for repair work—can turn over case records. D. R. James, Broken Bow, Nebraska.

WANTED—Late model tube checker. S & J Appliance, 218 E. 26th St., Chicago, Ill.

FOR SALE—Hickok counter type tube tester, Philco automatic record changer with cutting arm, Superior channel analyzer "Modern Radio Servicing" by Ghirardi, and Rider manual #8. $140 for all. Supreme Co., 107 E. Long Ave., New Castle, Pa.

FOR SALE OR EXCHANGE—Argus C3 w/case, excellent condition, and Eastman Kodaslide #1 w/case. Want Echophone EC-1 or equivalent ac-dc communication receiver, and multitester. G. M. Charles, Keams Canyon, Arizona.

WANTED—All-wave sig. generator in good shape, and late model tube tester. Melvin Gassert, 324 E. Kansas, Arkansas City, Kans.

WILL SWAP OR SELL—Tube tester in A-1 shape for small table radio, portable combination or electric. Jacques McCormick, St. F.X. University, Antigonish, Nova Scotia, Canada.

WILL TRADE—35L6GT, 1A7G, 1N5G, or 12SQ7GT, for urgently needed 117Z6GT. Joseph A. Carroll, 1570 Summit ave., Hillside, N. J.

WILL TRADE—1S4, 1Q5, 6H6, and 6P5 tubes for 25B8 tube. H. W. Smith, Route 1, Rocky Mount, Va.

WANTED — Good quality pre-selector. Lloyd Beckworth, Chief Engineer, Radio Station WLOG, Logan, W. Va.

WANTED — Communication receiver in fair condition, approximately $50. David R. Walker, RM1C, U.S.C.G., C.G.C. Tamarack, c/o Submarine Training Activity, Manitowoc Shipbuilding Co., Manitowoc, Wis.

FOR SALE OR TRADE—New 6K7; also used tubes; 2A7, 01A, 6X5GT, 6J7, 235, 59, 6K7-G, 14H7, and 280. Want a small tube or set tester. Robert E. Davis, Box 65, Damascus, Ohio.

WANTED—Superior #1230 sig. generator and Superior #1240 tube tester. Norris Hathaway, R.2, Adrian, Mich.

FOR SALE — Triplett #1671 vibrator tester, Sprague interference analyzer, Zenith test speaker (variable impedance), Vibroplex, Hallicrafter's Sky Challenger II, #SX18, with crystal filter. O. J. Rasmussen, 1129 N. 26th St., Billings, Mont.

FOR SALE OR EXCHANGE—Two Crosley #417 interoffice communication sets, complete with tubes, etc., in perfect working order. Want up-to-date all-wave sig. generator. J. B. Tannehill, 210 S. College, Salem, Ill.

URGENTLY NEEDED — Hickok #530-P tube tester. Sgt. Fred A. Rauher, Hqs. & Hqs. Co. T. C. S., N.O.A.A.B., New Orleans, La.

FOR SALE—Portable Federal recorder, 10" limit, complete with microphone and loudspeaker, and stock of blank records. K. A. Rose, Box 546, Macon, Ga.

WANTED—American Code reader unit and master Teleplex unit. Also, any width paper tapes of Morse land code or International Morse radio code. H. E. Leigh, Sr., 801 Clintonia ave., San Jose 10, Calif.

FOR SALE OR EXCHANGE—Meissner F. M. Converter. Want crystal pickup phono motor and recorder. A. M. Stump, 311 Marathon ave., Dayton 6, Ohio.

WANTED—Echophone EC-1 or similar receiver, in A-1 condition. S/Sgt. William S. Hagstrom, Sqdn. "N," 331st. Box 212 Barksdale Field, Louisiana.

WANTED — Small recorder, comm. receiver, V-O-M, astatic crystal pickup and arm or what have you? Harold McLean, 2nd Lt. A.C., Base Radio Officer, C.A.A.F., Childress, Texas.

YOUR OWN AD RUN FREE

This is Sprague's special wartime advertising service to help radio men get needed parts and equipment, or dispose of radio materials they do not need. Send your ad today. Write PLAINLY—hold it to 40 words or less. We'll do everything we can to help you—and the fact that thousands of pieces of Radio-Electronic equipment are in operation today as a result of sales or "swaps" made through The Trading Post offer convincing proof of the far-reaching effectiveness of this service. Ads offering equipment for sale bring best results, and will be given priority.

Different Trading Post ads appear monthly in Radio Retailing Today, Radio Service-Dealer, Service, Radio News, and Radio Craft. Sprague reserves the right to reject ads which do not fit in with the spirit of this service.

When buying Capacitors—please ask for Sprague's by name. We'll appreciate it!

HARRY KALKER
Sales Manager

SPRAGUE PRODUCTS CO., DEPT. RSD-114, North Adams, Mass.

(Jobbing distributing organization of products manufactured by SPRAGUE ELECTRIC COMPANY)

In Trade

(from page 6)

road locomotives and the other on the site of the world's first scheduled radio broadcast, soon will form the nation's newest communications network.

Immediate purpose of the system will be to speed wartime switching operations to and from Westinghouse plants in East Pittsburgh, Trafford and Linhart, Pa., by allowing switching orders to be delivered to engines wherever they are within the five square mile area occupied by the plants. Up to now engines completing a series of operations perhaps as much as five miles from the dispatcher's office had to travel back to that office for new instructions. New instructions can not be given by static-free radio, at will, to each engine at any location on the company's 25 miles of switchtracks.

Specifications: main station, 50-watt FM transmitter; mobile transmitters, 40-watts; and all six stations will broadcast in the 10-meter band, a wave length too low for home receiver pick-up.

Two-network P-A System

Radio servicemen who are getting their share of p-a and intercom. work—and according to the mail that comes in to RADIO SERVICE DEALER there are quite a number—are aware of the extreme care that must be taken to get the systems to operate without interruption, especially on special occasions.

RCA engineers recently designed a two-network public address system to assure uninterrupted broadcast of ceremonies at the launching of an aircraft carrier and two cruisers in Philadelphia.

Designed especially for this occasion, the system was made proof against severed wires or detached connections. The engineers aligned 120 high-powered loud-speakers into two circuits, capable of functioning as a combined network. In an emergency, either channel was capable of carrying the full program alone. Every second loudspeaker was connected to an alternate network so that a complete sound system would still be available if one of the circuits were accidentally put out of commission. Volume control could be manipulated to compensate for reduction of the number of speaker outlets in such an event.

Microphones, amplifiers and sound mixers were likewise set up in duplicate to make the public address system mechanically and electrically foolproof. Microphones were installed at six principal points — on each of the three launching platforms, the speaker's platform, the band stand and the pumping room of the Navy Yard drydocks. (P.S. —The ceremonies went off without a hitch).

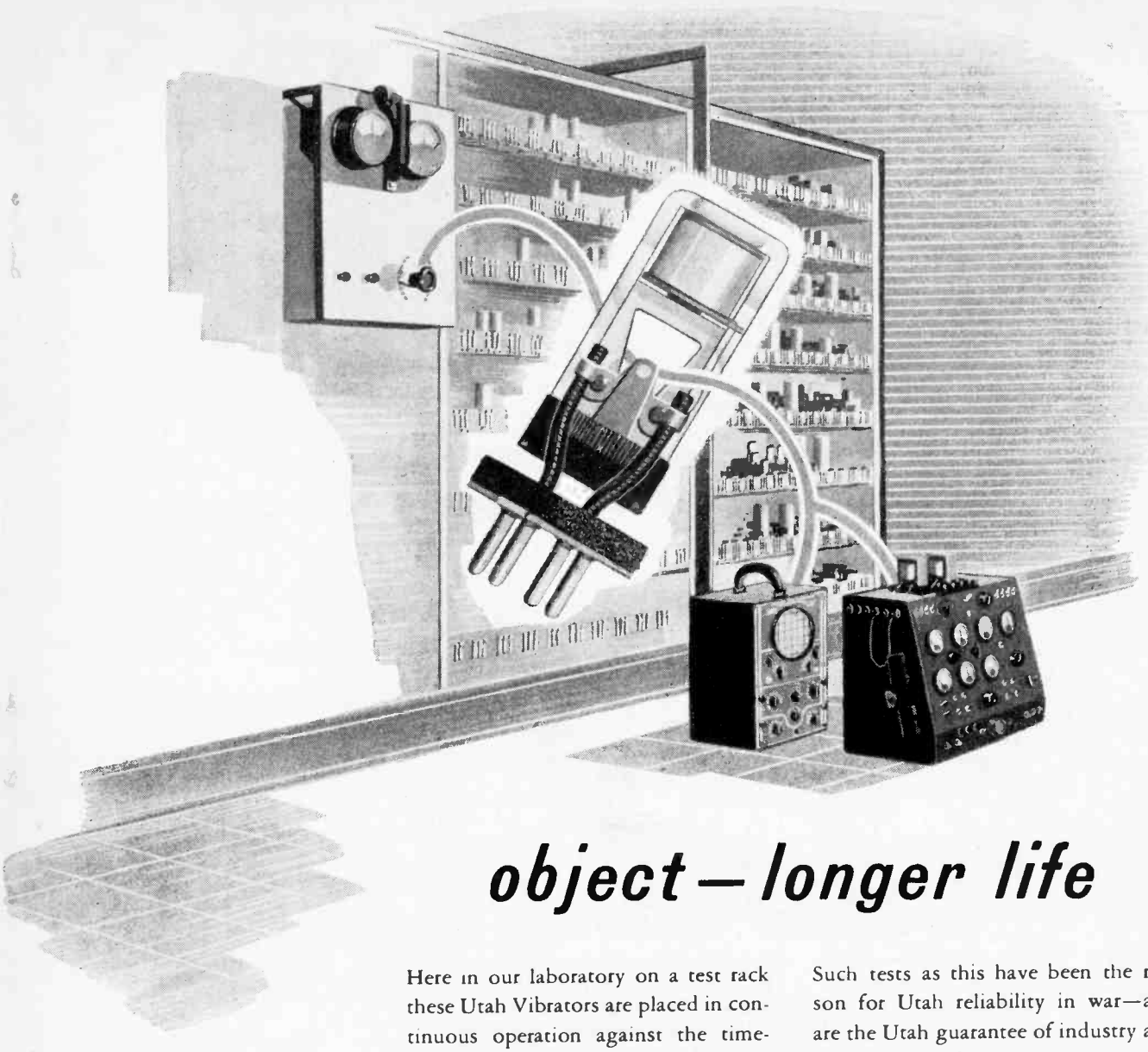
Aerovox Gets "E"

S. I. Cole, president, Aerovox Corp., accepted an Army-Navy award for outstanding capacitor production. Over 5,000 attended the ceremonies.

Television Priced

According to Thomas F. Joyce, general manager radio, phonograph and television department of RCA Victor, television is ready for the public. Postwar television home receivers will be offered ranging in price from about $150 for a table model to $395 for a large projection model including standard and frequency modulation reception. The sets will be better as to picture size, detail, brightness, contrast and simplicity of operation. He urged the Federal Communications Commission to permit television to go ahead in its present channels. thus opening the way for added postwar employment and greater economic expansion. If the green light is given, television re-

(Continued on page 38)



object—longer life

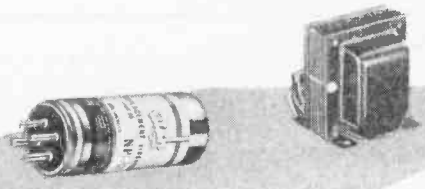
Here in our laboratory on a test rack these Utah Vibrators are placed in continuous operation against the time-clock until they finally break down.

Thus Utah engineers prove the worth of design and the quality of materials that give their product such an enviable record of long, trouble-free service.

Such tests as this have been the reason for Utah reliability in war—and are the Utah guarantee of industry and consumer satisfaction in peace.

★ ★ ★

Every Product Made for the Trade, by Utah, is Thoroughly Tested and Approved



Keyed to "tomorrow's" demands: Utah transformers, speakers, vibrators, vitreous enamel resistors, wirewound controls, plugs, jacks, switches and small electric motors.

utah

Utah Radio Products Company, 836 Orleans Street, Chicago 10, Ill.

In Trade

(from page 36)

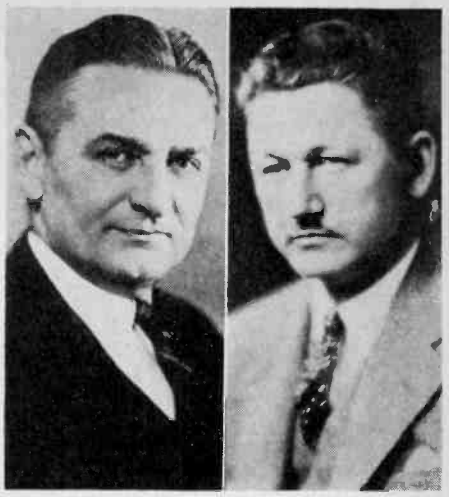
ceivers should be available and on the market nine to twelve months after civilian production is authorized.

Admiral De-Luxes a Combination

Ross D. Siragusa, president, announces the Admiral Corporation, Chicago, has perfected an 8-in-1 combination television-radio-phonograph which will probably sell at retail for $625 to $1,000. The working model, used in the company's laboratories for some time, is equipped to provide an image 5½ by 8 inches in its standard television receiver; also, standard and FM radio reception; short-wave; automatic phonograph and home recorder. Distributors saw the new model early in November at a meeting in Chicago.

Westinghouse Ready for Radio

Walter C. Evans, vice president, announces that the company's plant at Sunbury, Pa., has been selected for production of all basic types of home radio receiver equipment as soon as its war production commitments permit. With the acquisition of a Hazeltine license organization of the receiver division for manufacture and distribution is progressing rapidly. Headquarters will be in Sunbury.



David J. Finn James W. Cocke

RCA Regional Appointments

Frank M. Folsom, vice president in charge of RCA Victor Division of the Radio Corporation, announces David J. Finn is manager of the Chicago region, and James W. Cocke manager of the Dallas-Atlanta region, with headquarters in Dallas.

Universal Returns to Recorders

In addition to its continuance of microphone manufacture, Universal Microphone Co., Inglewood, Cal., will return to the recording field when civilian production is authorized. Until about five years ago the company made complete professional recorders. The new activity will embrace the making only of recording components for firms making their own radio chassis for assembly in their own complete recorders and combinations. The line will include cutting heads, recording mechanisms, assemblies and other parts and accessories.

Hoffman Distributors

H. Leslie Hoffman, president, announces Hoffman Radio Corp., Los Angeles, has appointed three coast distributors: Stubbs Electric Co., Portland, Ore., Love Electric Co., Seattle, Wash., Western Radio & Electric Co., San Diego, for Imperial and San Diego counties.

Garod's Personality Campaign

Personalities of the stage, screen and radio are now playing a starring role in the Garod Radio Corporation's advertising campaign. John Boles, star of "One Touch of Venus," Joan Roberts, featured in "Oklahoma," and Lucille Manners, soprano star of radio and concert stage have appeared in the first three advertisements of this series.

The advertising features famous stars whose endorsement has claimed much attention, since the Garod radios are their present and post-war choice. The program will be extended so as to bring before the public more of the outstanding personalities who, in their limited leisure chose the Garod radio. Future full-page ads will include such names as Harpo Marx, Danny Kaye, Vera Zorina, and many others. *(Continued on page 44)*

HOW'D YOU LIKE TO GET THESE 2 GHIRARDI BOOKS *for* CHRISTMAS?

What could be finer for Christmas, more appreciated, or longer remembered, than a gift that will help you for years to come in building a better more profitable Radio Service business? What could be more appropriate for a man in the service who wants to equip himself NOW for a better post war job?

And so here's a real hot Christmas buying tip: If you're buying a gift for someone in Radio (or in the armed services) give him one or both of these helpful, money-making books. Or if a friend or relative is wondering what in the world to get *you* this year, why not drop a hint that nothing would please you more or help you more than a Ghirardi book? Hand them the coupon below. *This year of all years, PRACTICAL gifts are the order of the day!*

CUTS TESTING TIME *IN HALF* STOPS GUESSWORK ON SERVICE JOBS

Maybe the screw-driver and plier serviceman isn't so dumb these busy days after all! Certainly not if he has learned to substitute A. A. Ghirardi's big 3rd edition RADIO TROUBLESHOOTER'S HANDBOOK for a lot of unnecessary troubleshooting! Simply by first turning to the 404-page Case History Section of this big book when a radio is brought in for repairs you can save a whale of a lot of time. Nine times out of ten, you'll find exactly the clue you need to repair it promptly—*and without any elaborate testing whatever!* Servicemen everywhere say that it helps them turn out from 50% to 100% more work in a given time! They're making more money as a result—*and how!*

Don't confuse this Handbook with previous editions. This is the big new enlarged 3rd edition. It is completely revised. It contains NINE MORE SECTIONS of vital new material. It brings you fingertip data on 75 subjects absolutely essential to every-day radio service work.

And remember! You dont' have to study the Handbook before it starts working for you. It goes right to work the minute you get it. It's like having a fast-working new helper who really "knows his stuff." It is designed throughout, and carefully indexed, to give you the specific information you need—*when you need it.* Hundreds of servicemen have written unsolicited letters to tell us that it has more than paid for iself in time saved the first time or two they referred to it.

DIAGNOSING — LOCATING — REPAIRING

Features of the RADIO TROUBLESHOOTER'S HANDBOOK include the most comprehensive and authoritative Case History section ever compiled. This contains common receiver Trouble Symptoms, their causes and remedies for practically every radio now in use—over 4,000 models! In addition, there is the most modern, most helpful tube chart you've ever seen; tube and parts substitution data; I-F alignment peaks for over 20,000 superhets; a big section on I-F transformer troubles—and numerous graphs, charts, helpful hints, and data compilations that will help you do every job better—and, generally, in a small fraction of the time you'd normally take.

This big, beautifully bound HANDBOOK costs you only $5 complete ($5.50 foreign) and you buy it on an UNRESERVED 5-DAY MONEY-BACK GUARANTEE. You cannot lose!

THE BOOK THAT GIVES YOU BASIC SERVICE WORK TRAINING

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Enclosed find $..... for books checked (send postpaid); or
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City & Dist. No. ..... State .....

The books that help you repair ANY kind of Radio equipment EASIER—BETTER—~~FASTER~~—MORE PROFITABLY

The "eye-dea" of this bond-appeal shot is to draw your attention to the whacking contest offering hundreds of prizes for radio service dealers. Caption provided by the sponsors reads, in part, "Hurry! There's no time to lose! You, too, can capture one of the 580 war bond prizes totaling $11,000 to be awarded to all retail radio stores and service shops throughout the country who will feature a $100 War Bond in their windows to promote the sale of war bonds in their communities in the 6th War Loan Drive starting November 20th."

JOBBER PRIZES ADDED TO 6th WAR LOAN DRIVE CONTEST FOR DEALERS

In addition to sponsoring the Retail Radio Store and Servicemen's Section of a national window display contest in connection with the 6th War Loan Drive, Sylvania Electric Products, Inc. will—according to Paul S. Ellison, director of advertising—run a special contest for jobbers. This will add another $1,000 in war bonds to the prize list of $10,000 already announced (RADIO SERVICE DEALER, October).

A total of 580 prizes is listed, beginning with 10 grand national prizes and 10 sectional prizes. War Bond prizes in these groups will carry special Treasury Citations for the nationals, Honor Awards for the regionals.

Grand National Prizes
Each Includes a U.S. Treasury Citation

First	$1,000
Second	500
Third	250
Fourth	150
Fifth	100
Sixth to Tenth	50

The first five sectional prizes are $50 each, plus honor award for competing nationally. The sixth to tenth prizes are honor awards for competing sectionally.

Retail radio stores participating in this contest will make photographs of their displays—which must feature a $100 War Bond—and send them to the Sixth War Bond Drive Display Contest Committee, care of Display World, Cincinnati 1, Ohio. All displays will be judged for their originality, sales appeal and attention appeal.

By the way, you don't have to display a real War Bond. A number of blow-ups of the official $100 War Bond will be available to dealers who write to Advertising Department, Sylvania Co., Emporium, Pa.

Surrender

STARTS WITH WAR BOND SALES

Official U. S. Coast Guard photo.

Two members of the shortening Berlin-Tokyo Axis captured fighting side by side in France.

A CONTINUOUS flow of money is the first requisite of a continuous flow of manpower and matériel to the fighting fronts.

Money, raised in continuous War Bond sales, makes it possible to attack—to attack unceasingly until the Axis is forced into total, unconditional surrender!

Retailers of America, our armed forces expect you to help make them the best trained, best equipped, best cared for fighters on land, sea and air. They want to finish the fighting at the earliest possible moment. They want to get home to the jobs that you will have helped to provide through built-up post-war purchasing power—*by selling more War Bonds than before!*

War Bond selling is your part of the job of bringing about the Axis' unconditional surrender. Keep working at it. Drive your War Bond sales to an all-time high. Then drive them higher! higher!! higher!!!

Back the Attack!

SELL MORE THAN BEFORE!

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 38)

Wilcox-Gay's line-up of giant C.A.A. transmitters ready for the front. The company announces a new, more versatile post-war "Recordio" for dealers.

Bendix Radio Compass

The War Department allows the release of the fact that over 75 thousand radio compasses have been delivered to the armed forces since Pearl Harbor by the Bendix radio division. Many of the improvements made to increase effective range, accuracy and sensitivity of new-type automatic radio compasses and other communications devices developed for war production will be incorporated in the line of home radio sets which the company plans to manufacture as soon as the military situation permits, according to William P. Hilliard, general manager.

New Service Manual

W. C. Noll, manager, General Electric appliance product service section, announces a new household refrigerator service manual is ready for distribution to servicemen. The manual covers all G-E sealed machines made since 1934, including late monitor tops and flatops. There are more than 200 pages, with 300 pictures and drawings. Which should make it very useful to the servicemen—and particularly profitable—as there are well over 3,000,000 of the company's refrigerators in customers' homes.

Ceramic Insulation

Culminating seven years of continuous research, the Sprague Electric Co., North Adams, Mass. has evolved a process for depositing a thin ceramic (inorganic) coating on copper, nickel, and other types of wire.

This new insulation is known as Sprague CEROC 200. When applied to copper wire it maintains desirable electrical characteristics at a continuous operating temperature of 200° C. as compared to the present limit of 105° C. for conventional Class A insulations such as enamels, varnishes, and other organic materials. Thus, by designing motors, transformers, chokes, and similar equipment to utilize the full maximum operating temperature of CEROC 200, smaller sized equipment can be designed to do larger-sized jobs, as a very substantial increase in volt ampere rating can be obtained.

A new bulletin describing this important development will gladly be sent on request to the manufacturer.

G.E. Booklet "Sells" Radio

First of the major radio receiver manufacturers to break the ice with performance and appearance forecasts of postwar home radio and television equipment, General Electric has just issued a handsome four-color booklet for distribution to consumers. The booklet actually illustrates the innovations which will be available to the public after the war.

Resumes Mikes for the Trade

James L. Fouch, president, announces a new model of the series D-20 dynamic microphone, the first the Universal Microphone Co. has presented to the trade since 1940. It will be manufactured in four impedances, with a range of 50 to 8,000 cycles. The company will also resume production of some of its KD and 15MM models, both of which are dynamics; the 200 series, a dynamic handi-mike model; and X-1 and XX, both carbons.

Cecil L. Sly, vice president and sales manager, states that distribution will be through factory representatives and parts jobbers, the usual company channels.

It's a Gift—for Customers

Here's a novel—and timely—take-off on the custom of sending gifts to customers at Christmas time. The customary business-appreciation gift is sent to the customer s son, daughter or some other person in his immediate family who is in the armed service. The way it works: a form letter is mailed to each customer telling about the plan and asking for names of the recipient's service sons, daughters or other relatives. The customer simply fills out a post-paid reply card and drops it in the mail. Then the gifts are sent out. Customer's reactions to this idea: "It is such unusual kindness and thoughtfulness which makes all of us . . . appreciative." The firm which thought this one up: Walker-Jimieson, Chicago—who are undoubtedly creating valuable good will for themselves.

Mike Booklet

Electro-Voice Corporation announces an illustrated booklet on various types of communications microphones. Nine models are described, together with prices and specifications. Dealers can get copies free by addressing the company at 1239 South Bend Ave., South Bend 24, Ind.

Juke Box Repairs Allowed

Production of parts for the repair or renovation of used automatic phonographs — coin or token-operated, is again permitted by WPB, subject to material conservation orders. The manufacture or assembly of automatic phonographs from either new or old parts is still prohibited by L-21. However, persons who wish to make or assemble these products or to make or transfer parts for other than repair or renovation purposes may apply for permission under terms of priorities regulation 25, "spot authorization" procedure. Limitation Order L-21 has been amended to permit the manufacture of repair parts for these products to be resumed after two and one-half years of non-production.

Silex Adds Combination Iron

Frank E. Wolcott, president, announces Silex Company, Hartford, Conn., is going into production of the first WPB-authorized batch of electric irons. The new appliance combines steam with dry heat. A lever enables the woman to change from steam to dry heat instantly, or vice versa, while she is ironing.

This is an attractive merchandising feature for the dealer, according to the manufacturer. The new product will be advertised nationally, and attractive point-of-sale counter displays will be available to those dealers who can get the merchandise to sell. Production is limited for the time being, in accordance with WPB restrictions. The iron will be distributed the same as the Silex coffee makers, through recognized jobbers of electrical and hardware products, and others.

Popular Ne-O-Lite Tester

General Cement Mfg. Co., announces the new G-C Ne-O-Lite Test Lite—a handy, inexpensive trouble shooter, for testing A.C. lines, polarity of A.C. or D.C., blown fuses, tracing ground line in A.C. circuits, as a radio frequency indicator, and for many other uses by radio servicemen. Can be used on voltages from 60 A.C. to 500 A.C. or D.C. New counter display card holding 20 units has a list price of $20. Address inquiries to 919 Taylor Ave., Rockford, Ill.

Torque Screw and Bolt Driver

Said to completely eliminate all danger of over or under-tightening, thread stripping, material-damaging, a new torque screw and bolt driver is announced by Richmont, Inc., 215 W. 7th Street, Los Angeles. It is 7¾" long, with a 1.30" diameter handle.

Known as the Livermont Roto-Torq, this new driver may be adjusted to any torque desired between 1 inch pound and 25 inch pounds for setting screws, small nuts, bolts, etc. Because it disengages itself at the proper torque, it is impossible for the operator to tighten beyond the prescribed fit or tightness. Two models are available: one with a screw driver as an integral part of the shank, the other with a quarter-inch square drive. Adjustments may be made from outside the handle by an easily read calibrated vernier arrangement.

Service Calls a Source of

POST-WAR SALES PROSPECTS FOR DEALERS

Walker-Jimieson, radio and electronic distributors in Chicago, offer a post-war sales and service prospects card to aid radio service dealers in doing a prosperous business after the war. The serviceman takes one of these cards with him when he makes a call and fills it out in accordance with his own observations and with the customer's answers to his questions. He notes the various types of radios and appliances now in the home, and those in need of repair or likely to need repair in the future. He records the customer's interest in FM, television and other features. When he returns to his shop he files the card for future follow-up.

The idea is that the dealer will review the cards after the war to determine the "hot" prospects for each type of radio or appliance he handles, or will handle as a result of his prospect survey. The card provides space for recording follow-ups of service calls, phone calls, letters, etc. The dealer's exact relationship with each customer can thus be seen at a glance.

With the help of similar cards, every radio service and appliance dealer can make his own "Gallup" polls in his own trading area, and roll up a sizable roll-call of real, live prospects for himself. The point is, the *factual* information contained on the cards must be converted—through repeated follow-ups—into *actual* sales. (See, "Bigger Sales," RADIO SERVICE DEALER, page 15, October).

SERVICE PROSPECTS

Customer Has_____ Radio Sets In Home And Car.
Makes & Models_____
Models Out Of Order_____
Repairs & Parts Needed_____
Tubes Needed_____
Other Appliances In Home:_____

Models Out Of Order_____
Repairs & Parts Needed_____
Models Beyond Repair_____
REMARKS:_____

SALES PROSPECTS

RADIO

Customer Will Purchase New Radios ☐ Yes ☐ No Interested in:
☐ Console ☐ Table Model ☐ Television
☐ Portable ☐ Bantam Portable ☐ FM
☐ Auto Set ☐ Phonograph Combination

APPLIANCES

Customer Will Purchase New Appliances ☐ Yes ☐ No Interested In:
☐ Range ☐ Refrigerator ☐ Washing Machine ☐ Air Conditioner
☐ Electric Roaster ☐ Waffle Iron ☐ Toaster ☐ Deep Freeze
☐ Flat Iron ☐ Mangler ☐ Coffee Maker ☐ Mixer ☐ Dish Washer
☐ Electric Razor ☐ Vacuum Cleaner ☐ Electric Clock

REMARKS:_____

This method helps dealers to prospect for customers ahead of time, accomplishes two things: number of buyers for lines carried; possible leads on additional lines.

MEN IN THE NEWS

Jack F. Crossin

Hamilton Sales Director

A. A. Juviler, president, Hamilton Radio Corp., makers of "Olympic" radios, announces the appointment of Jack F. Crossin as national sales director. With a 20-year business record, Mr. Crossin was on the executive staff of The Crosley Corp. for the past four years. He is now engaged in setting key distributor commitments for the company's contemplated lines of table model, portables, FM and AM consoles, radio combinations and television sets. A comprehensive program of trade promotion and national consumer advertising is under way.

Crosley Sales Manager

J. H. Rasmussen, general sales manager, announces the appointment of L. C. Truesdell as sales manager of the manufacturing division of The Crosley Corporation. He will have charge of all field operations, in addition to being responsible as assistant commercial manager. Mr. Truesdell, with 20 years' experience in appliance merchandising, replaces B. T. Roe, who left Crosley to become vice president and general manager of J. N. Ceazen Co., Crosley distributor in Los Angeles.

L. C. Truesdell

MEN IN THE NEWS

Donald H. Mitchell

Mitchell Gets Award

Donald H. Mitchell chief engineer, Galvin Mfg. Corp., was presented with the War Workers Award by the Chicago Tribune for developing the "Handie Talkie"—the now famous portable, battery operated, two-way radio used at the battlefronts. The award was made in the presence of high officials of the corporation.

Ad Index

$1.00 PAID FOR SHOP NOTES

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

The Customer will rule again

and that day draws closer and closer!

A famous economist writing in his daily newspaper column recently said: "After the war our economic system will again cater to many buyers . . . individuals and their families . . . instead of to a single customer—the government. Then we will see once more that it is the customer who determines the type, the quality and the price of goods which will be produced and distributed. The customer's power lies in his freedom to exert or withhold his purchasing power, and we know that he is going to have plenty of purchasing power when Victory brings us Peace and normal living once again."

MOTOROLA RADIO ENGINEERS, DISTRIBUTORS AND DEALERS WILL BE READY

The Motorola organization is intact. Our war job has been the designing and building of radio communications for our armed forces . . . and we have delivered them in great quantity. Because of this expanded activity in radio, our own field, there will be a minimum of conversion necessary in the Motorola engineering laboratories and factories.

The Motorola Radio Engineers who originated and developed the famous "Handie Talkie" . . . who built the improved F-M Walkie Talkie and the Cavalry Guidon set for our armed forces . . . are ready for their Post-War job of building America's Finest F-M Radios for Home and Car.

★ ★ ★ ★

Millions of American *customers* who have carefully nursed their Motorolas through this war will be rewarded one day soon with the finest Radios ever to bear the Motorola trademark.

Motorola Engineers who were famous in peacetime for radio that *delivered* peak performance will have pleasant surprises for you in Motorola Post-War Radio for Home and Car.

GALVIN MFG. CORPORATION • CHICAGO 51

Motorola Radio

F-M HOME & CAR RADIO • AUTOMATIC PHONOGRAPHS • TELEVISION • F-M POLICE RADIO • RADAR • MILITARY RADIO COMMUNICATIONS

NEW COMPLETE RADIO TUBE DATA BOOK BY RAYTHEON

THE new complete data on tubes, including characteristics, outlined drawings and basing diagrams of all standard receiving tube types; simplified interchange information including over 1600 substitutions; hearing aid tube data and technical information regarding radio panel lamps. All this is included in the new Raytheon Tube Data and Substitution Chart prepared by the Technical Service Department of Raytheon Manufacturing Company.

The value of the technical information in this manual is inestimable and yet it may be obtained FREE from your Raytheon receiving tube distributor. Everyone concerned in the repair and maintenance of radios must have this ready reference book.

This manual is the first step in a tremendous merchandising plan which will bring you better business. This program teamed up with the superior, "Plus-Extra" quality Raytheon Tubes, will assure you of better customer goodwill, faster turnover and greater profits.

Raytheon Manufacturing Company

RADIO RECEIVING TUBE DIVISION

Newton, Massachusetts • Los Angeles • New York • Chicago • Atlanta

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

RAYTHEON

High Fidelity

RADIO AND ELECTRONIC TUBES

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