

radio service dealer



Stroboscopic
Phono check
See Page 32

In
This
Issue:

Filling Out The WPB-617 Form
★
Parts' Store Goes To War - AM vs. FM

may, 1944
25c



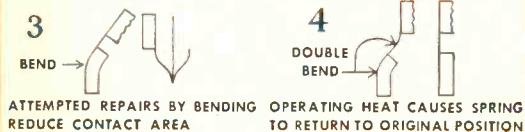
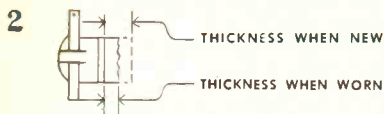
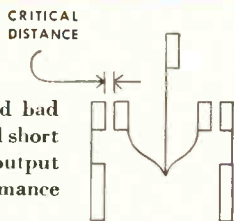
Precision Production Means Careful Inspection, Too

Common Errors in Attempted Vibrator Repairs

If you are thinking about tearing that vibrator out of the can and "working" on it, beware! Remember that individual parts of the vibrator mechanism are selected to operate with each other—adjusted to give maximum voltage output for the longest life. When contacts wear to the point of failure, attempts to bend or rework springs and arms can never return the vibrator to efficient operation.

1 SPACING

If too close, arcing and bad wave result in noise and short life. If too wide, low output voltage and poor performance can be expected.



This business of building a vibrator goes far beyond just "putting a few parts together." It involves close control of material in the fabrication of every part followed by systematic inspection. Assembly operations are performed by skilled operators. But the assembly is only the beginning.

After the delicate mechanism is ready for the can a highly skilled technician carefully adjusts the contacts. Another inspector then checks the exact spacing on the "Shadowgraph," a Mallory-designed instrument that enlarges the image of the tiny contact hundreds of times for the most minute adjustment. After the proper adjustment the vibrators are further checked for actual performance. Other trained technicians carefully adjust each mechanism on an Oscilloscope to insure correct, exact wave pattern. It is only after these complete and exhaustive tests that the vibrators are sealed in the cans and permitted to bear the Mallory trade-mark.

When you buy a Mallory vibrator you can be assured of its quality and performance, backed by the most rigid selection of materials, production methods, precision adjustment and inspection in the industry.



Buy More War Bonds

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

Mallory Helps for the Radio Service Engineer

MYE TECHNICAL MANUAL
—408 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.

14TH EDITION RADIO SERVICE ENCYCLOPEDIA
Complete information on repairing any make or model of receiver. Circuit references, original part numbers and recommended replacements. Available from your Mallory distributor... Price, 95 cents.



P. R. MALLORY & CO., Inc.

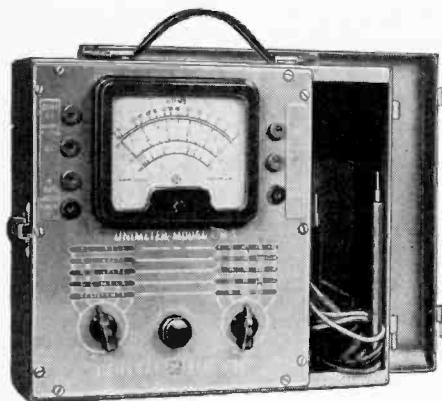
MALLORY

Approved Precision Products





UNIMETER



• Completely portable all-around utility instrument, ideally suited for reliable service work. Large meter calibrated to reduce the error possibility in readings makes the G-E unimeter a popular one with servicemen.

Other General Electric units available for testing electronic circuits and component parts are: audio oscillators, oscilloscopes, condenser resistance bridges, signal generators and other utility test instruments.

For complete details about the new General Electric line of SERVICE TESTING EQUIPMENT, please fill out the coupon below. . . .

FREE
CATALOG

**ELECTRONICS DEPARTMENT
GENERAL ELECTRIC CO.
Schenectady, N. Y.**

Please send, without obligation to me, the General Electric Testing Instrument Catalog, D-5 (loose-leaf), for my information and files.

Name _____

Company _____

Address _____

GENERAL ELECTRIC
164-C8
Electronic Measuring Instruments

May, 1944

RADIO SERVICE DEALER

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

VOLUME 5, NUMBER 5

MAY - 1944

CONTENTS

With The Editor	2
Manufacturer's Post-War Plans, etc.	
In & Around The Trade	4
Electronics are an excellent Post-War bet	
Parts Store Goes To War	6
How a big parts' store converted to war work	
Shop Notes	9
Hints and short-cuts for the serviceman	
How To Fill Out The WPB-617 Form	10
A necessary before selling industrial sound installations	
AM Answers The Challenge of FM	14
One answer to the FM challenge of multi-channels	
A Tube Simple Rejuvenator	16
A tube rejuvenator for the serviceman to make	
DISCUSSION	20
What's doing in the recording world	
Letters To The Editor	22
The Hue & Cry of the readers	
FM-Tele News	23
Short items in the FM, television and allied fields	
ELECTRICAL APPLIANCE RETAILING SECTION	
Refrigerator Repair Hints	18

SANFORD R. COWAN <i>Editor & Publisher</i>	KARL A. KOPETZKY <i>Managing Editor</i>
JOHN H. POTTS <i>Contributing Editor</i>	HENRY F. KROEGER, JR. <i>Photography</i>
ROCCO D. NAVIGATO <i>Art</i>	SYLVIA BORNKOFF <i>Circulation</i>
CHARLES H. FARRELL <i>Advertising Manager</i>	

Copyright, 1944
COWAN PUBLISHING CORP.

Executive & Editorial Offices: 342 Madison Ave., New York 17, New York
Member of the Audit Bureau of Circulations.

Midwestern Editorial Offices: 7645 North Sheridan Road, Chicago 26, Illinois

RADIO SERVICE DEALER is published monthly at 34 North Crystal Street, East Stroudsburg, Pennsylvania, by the Cowan Publishing Corp., Executive & Editorial Offices: 342 Madison Avenue, New York City 17, New York. Subscription rates:—United States and Possessions \$2.00 for 1 year, \$3.00 for 2 years; elsewhere \$3.00 per year. Single copies: 25c. Printed in U. S. A. Entered as Second Class Matter October 3, 1941 at the Post Office at East Stroudsburg, Pa., under the Act of March 3, 1879. All subscribers should allow at least three weeks for change of address. Everything concerning subscriptions should be directed to Circulation Dept., 342 Madison Ave., New York 17, N. Y. Material submitted must contain a self-addressed stamped return envelope. While every effort will be made to handle articles with care, the publisher assumes no responsibility. Material accepted is subject to any revisions, including change to, or omission in "by-line" as well as author's name, which in the opinion of the publisher may be deemed necessary or expedient. Payment will include all photographs, sketches, diagrams as well as all of the author's right, title and interest in and to the material submitted. Material submitted will be considered to have been released by the person or persons shown or mentioned therein, and the authors agree to hold this publisher harmless from any manner of suit or damage resulting from the printing of said pictures or articles.

with the editor

Manufacturers Plans

PRACTICALLY EVERY MANUFACTURER, and many leading distributors, of appliances and radios has been interviewed by our staffmen within the past three weeks in an effort to ascertain their post-war plans. In all cases manufacturers admit that their primary and secondary post-war objectives have already been decided, subject to revision only if the war continues for a very long time. (The consensus is that the war will end in late 1945 or early in 1946). For what it's worth, we pass on our "findings":

There will be a dozen or more new, big manufacturers in both the appliance and radio manufacturing fields. So the number of franchises a dealer may choose from will not be too limited. The old-time manufacturers will try to protect their old customers by giving them first preference. The new-comer manufacturers are now seeking distributors and are lining up potential dealer outlets. Old, established manufacturers are satisfied with their pre-war distribution setups, as a whole. But they are slated for a surprise because many old distributors don't feel the same way, and are shopping around *sub rosa* for new lines that might have more saleability. Knowing that some manufacturers will be able to get back into civilian production quicker than others has caused some distributors to try to guess who will be the "quickie-deliverers"; hop-

Replacement Units Are Needed Now

EVERY ONE OF THE Hooper and Crosley reports recently issued show that there continues to be a consistent decline in the number of radio sets in use. For example, C. E. Hooper, Inc., reports for April 15 an average evening program rating of 9.9 down 0.5 from last report, down 0.8 from a year ago. Average sets-in-use 29.5, down 2.3 from last report, down 0.1 from a year ago.

Members of the R.M.A. meet-

ing that by grabbing those lines they will be able to make a clean-up before the others get into stride. Such short-sighted distributors are riding for a fall, because the public, having once made up its mind about any given brand of set desired will wait for same to arrive at dealers'.

An interesting thing about post-war radios and appliances is this: there will be many new specialty items in the high-price field. For example, one set maker plans a line of super-deluxe, precision instruments, in beautiful consoles, to be priced from \$750 to \$3000. No, the sets won't have back-scratchers or X-ray fluoroscopes, or any fancy gadgets other than multi-band high fidelity circuits, but they will be true musical instruments for which there has always been a limited demand, not heretofore satisfied entirely. And in the appliance field, one prominent manufacturer plans to release what could be called the "complete modern kitchen," which will be just that, with every known modern appliance incorporated in one project, saleable in unit multiples, from automatic garbage disposal units down through dish-washers. Architects will grab at the opportunity to specify such complete electrified installations for new homes to be constructed, and the dealers or distributors who handle such class merchandise will probably do very well for themselves.

ing last month opined that the stepped-up radio-for-war production program now in effect will require the entire effort and resources of the industry throughout 1944 with no prospect of any civilian production, except for a limited number of replacement tubes and parts, before 1945.

Meanwhile WPB again reversed itself by declaring that now, because of the man-power

(Continued on page 29)

MEISSNER OF MT. CARMEL



Beauty — and Accuracy! Top-grade personnel, brought up in a community where electronics skill has become a heritage, give Meissner products their far-famed quality. There are hundreds doing similar work.

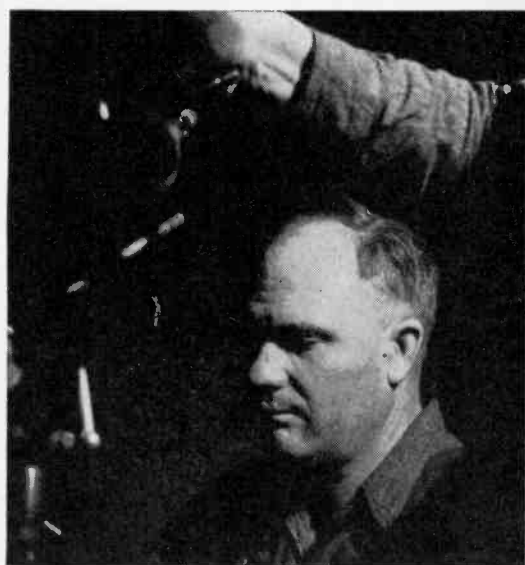


Close Co-operation! This is a factory conference at Meissner's Mt. Carmel plant. Here production plans are worked out for maximum harmony, top efficiency.

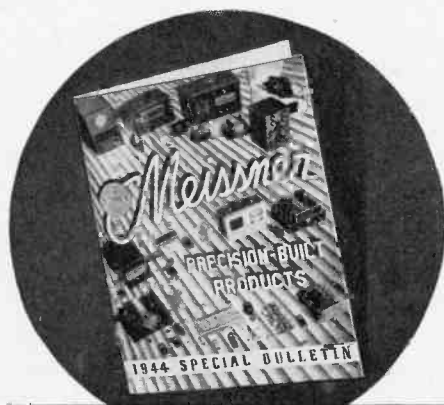


Trouble for the Axis! Youthful vision here combines with mature judgment to keep Meissner in the forefront of electronics progress. These men are testing.

Why all eyes in the
Electronics Industry
are on
this little city
in Illinois



Precision-el—that's the name earned by Meissner personnel because of their skill at all types of precision work. Here is one of many Meissner veterans.



**Just Out!
Special 1944 Bulletin!**

—showing radio parts in Meissner's 1944 line. Contains complete descriptive matter, with pictures. Now, more than ever, you need to know what the market offers. Send for your copy today. The supply is limited. It's free. Write to address below.



MEISSNER

MANUFACTURING COMPANY • MT. CARMEL, ILL.

ADVANCED ELECTRONIC RESEARCH AND MANUFACTURE

In & Around the Trade

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

Sylvania Promotes 'Pat' Patterson

C. W. Shaw, general sales manager of the Radio Tube Division of Sylvania Electric Products Inc., has announced the appointment of W. G. "Pat" Patterson as manager, Distributor Sales, California Division.

Patterson has been with Sylvania in a sales capacity since 1935, working in both the radio tube and lighting divisions of the company. His experience in the radio field is widespread and dates back to 1922, when he was with Radio Station KFI in Los Angeles. Pat's knowledge of the radio service dealer's problems has been enriched by experience gained while operating a retail radio and service business in Los Angeles. He has a wide acquaintance among radio men on the Pacific Coast, and he is also a charter member of the Radio Pioneers Club. Having been active in amateur circles for years, Pat holds amateur license number W6HWT.

Robt. C. Berner to Join Emerson Radio Staff

Robert C. Berner has resigned from the WPB to return to Emerson Radio & Phonograph Corporation as Assistant to President Abrams.

Mr. Berner has been Chief of the Contender Section of the Office of Civilian Requirements for the past year. In 1941 he was one of the first members of the Division of Civilian Supply of the old OPM, where as Assistant Chief he helped to organize the Consumers' Dur-

able Goods Branch, which was responsible for converting many civilian industries to war work. He was Chief of the Radio Section during the period when the civilian radio industry was being converted to war production.

Sonora's New Plan

The formulation of an unemployment compensation program to help solve postwar unemployment problems was announced today by the Sonora Radio & Television Corporation of Chicago, now manufacturing aircraft communications equipment.

Under the Sonora Plan, payment of \$20.00 per week for a maximum of 18 weeks will be made in the event any employee is laid off. Such payments will begin after the 18 weekly payments from the state; or if for any reason the state payments are not made to the employee, payments from the Sonora fund will begin immediately.

The entire cost of the unemployment compensation fund, which was created primarily to care for employees who are without employment due to conversion of the plant from war production to peacetime activity, is taken care of by the company. No contribution or payroll deduction is required from any employee.

"If every industry in the nation would promptly adopt a similar plan, I am sure we can avoid any serious unemployment problem after this war," Jos. Gerl, president of Sonora, said. "It has been our experience," he



John M. Smith, who resigned from RCA to join P. R. Mallory & Co., Inc., Indianapolis, as Vice-President in Charge of Manufacturing, recently

pointed out, "that funds contributed by the company are deductible as legitimate expense on war contract negotiations and from corporation taxes."

One of the outstanding features of the plan is that employees in the armed forces will be eligible for benefits of the fund upon their release from the service. In the event they have given their lives, the Sonora plan calls for payment of a sum equal to 18 weeks' unemployment compensation to next of kin.

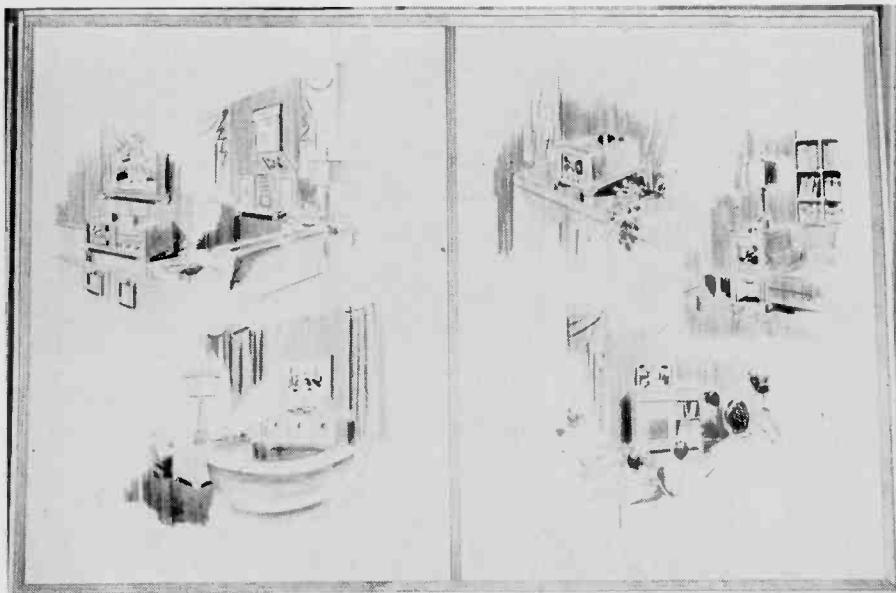
"We have instituted the unemployment compensation fund to make sure our organization is kept together," Gerl said. "The majority of our workers are of the highly skilled type, and we are of the opinion that it is a moral responsibility of Sonora to make certain our employees have a feeling of security."

The reason the Sonora payments begin after the State compensation is ended, Gerl said, is because the employee would not be eligible for state compensation if he had any income from the employer.

N.C.C. Offers Free Book

Readers who would like to have a free copy of the first complete story of the development and uses of dry batteries should write to National Carbon Company, Inc., 30 East 42 St., New York 17, N. Y., for it. They will receive an illustrated 48-page booklet that has attracted much attention for its readable and authentic text. It is now used by the Navy, Coast Guard and Marine Corps Training Divisions, as well as many colleges and other educational institutions.

"The Inside Story of Dry Batteries: A Guide for Students," is the title. The booklet has been prepared by scientists of National Carbon Company, Inc., the country's oldest and largest dry battery manufacturer, and takes the reader from Alessandro Volta's discovery of the electro-chemical principle, in 1798, to the efficient units of today. The offer is made on the condition that no more than a single copy can be sent to each applicant.



Sketches of the General Electric Company's new television receivers



How to Behave in a Storm by Don Herold

Any upset may be an opportunity to grow—and remodel.

It may be awfully uncomfortable—but it can be darned valuable.

Last summer, lightning struck our summer cottage and burned off the south end. Well, it gave us a chance to enlarge our living room.

This war hurts a lot of us. But it is going to give many folks a chance to get some perspective on themselves.

A lot of radio service men are in a terrible stew right now. Parts and help are hard to get. It's a mess!

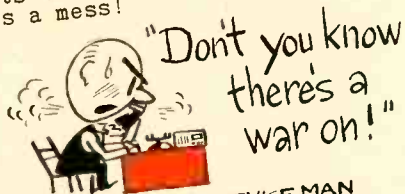


PHOTO OF A RADIO SERVICE MAN
THROWING AWAY POST-WAR BUSINESS

But, at least, it's different! And it can be stimulating. And after it's all over, you can have things different.

Maybe this is the time to revise your shop—straighten it up—switch it around—get it spic and span.

This certainly is the time to make postwar plans—to think of a future twice as big as your past—to start to get wise on coming new products in radio and allied lines. And it is a time to make

friendly prospects out of customers in trouble—to help boom your business in those days to come.

As a typical consumer, I'm itching for better postwar radio equipment and all the other new electrical gadgets that are on the way.

"I'm going to tidy up the place and tidy up my mind"



And, incidentally, I have more confidence in dealers who let it be known that they string with famous manufacturers and use high grade parts—for instance INTERNATIONAL RESISTANCE UNITS.

No. 4 in a series of special messages prepared by America's famous business writer, humorist and cartoonist, Don Herold. . . . In sponsoring these Don Herold "broadcasts," IRC pays tribute to the thousands of Radio Service Men who, whenever possible, specify and use IRC resistance units in their work.



INTERNATIONAL RESISTANCE CO.

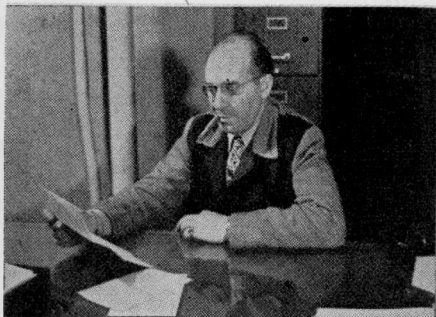
401 N. Broad St. • Philadelphia 8, Pa.

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



Parts' Store Goes to War

by Samuel Poncher



The author seated in his office from which he directs the store operation

ON THE "day that will live in infamy" we were not totally unprepared for what was to come. We had been seeing the hand-writing on the wall for some time, and with the slow dwindling of amateur radio supply business we had been casting around for a suitable substitute. As things worked out, we were already set for the duration. Selling to the war plants became our business—the fast, prompt deliveries, sometimes right from our stock, and more often by lumping our orders, which got the war plants the small items so hard to order from manufacturers, and so difficult to keep track of. We became specialists in radio parts supply for radio stations, for laboratories, for



A portion of the rear of the store is devoted to back-orders. Those which are partially completed are kept in metal trays on the counter

schools (both of the armed services and those catering to them), for radio equipment manufacturers holding short, "trial" orders from Uncle Sam, and for the supplying of other jobbers (at list prices less usual discount).

To do a proper job we have had to keep a stock *on hand* of over 10,000 items; and it has been a continual struggle to keep these at full strength. It has meant many trips to our supplier's plants, much arguing with Washington, and a keep-after-it-with-priorities-effort. For, except for that business which is legally priority-free, everything we sell is on the basis of that precious piece of paper in one form or another.

Probably the best non-priority merchandise from the dollar-sale angle has been sound recording discs. Originally, we carried these only as an accommodation for our customers. After Pearl Harbor, they became one of our best as well as our first civilian lines.

We have been asked many times, "How do you pick your lines?" Our answer is that we don't pick them; that the customers do. When we find that we get repeated requests for a certain type of merchandise, we generally get it in. But during the war we have been specializing. Normally we will try to get anything a customer asks for, providing that his priority rating warrants it. We do no direct solicitation of war plants, though we are doing a minor bit of advertising. We use the *Chicago Purchasor* and *QST*, employing institutional copy; and recently we have put a small radio program on the air over *WJJD*, one of Chicago's largest independent stations.

This means but little, and all our business adds up to the fact that we are giving service with a capital "S"; and it is this service that is doing our selling!

With only 8 employees against the 12 we had pre-war, we are still able generally to give 4-hour delivery! How this is done makes an interesting study, and one which will pay other dealers dividends, if properly administered and used.

When an order is received, it is

sent to an order-picker or one of our technical staff for filling. If we have it in stock, or the greatest part thereof, it is assembled and sent to the shipping clerk. He makes out a shipping ticket in duplicate. One copy is filed alphabetically under the customer's name and the other goes with the order, which is promptly shipped or delivered.

With the shipping ticket and the original order as a starter we make out a card which contains the customers' names, their permanent addresses and the amount in dollars which has been shipped with the date of shipment. That is all. To that card is added the amount, day after day, that is shipped. Thus the cards serve at once as a shipping record for each named customer, and at the same time make us a *live* mailing list! We believe that we have the best and liveliest mailing list in the business! It will some post-war day pay off handsome dividends.

What do we do with partially or completely unfilled orders? Those which are un-rated and un-filled (or unfillable) are immediately cancelled. We find that there is small use cluttering up our account books and the records with a long list of these unfilled or unfillable orders merely waiting "for a break." Those with priority are treated a bit differently by virtue of the Government regulations.

A double system is used to ensure that the "priority" clients get their



Shipping is done from this small space in the back. All usual means of transportation are employed, including the author's car if needed

"A Ham store is doomed", said the wise guys! But this was once when they were wrong. Using unique methods and featuring superb service, Newark Electric has won its battle

merchandise as soon as possible and at the same time to see to it that they are not served out of turn, when more than one orders the same material. A card is made out for each line of merchandise, and each customer's name is marked down thereon with the number of the items of that line ordered by him. Secondly, a copy of the customer's back-order is typed and filed alphabetically by customers' names.

The purchase order we place on our supplier contains the name of the customer for whom the merchandise has been ordered; and when the material is received by us, it is first checked off the card and then against the back-order blank and then shipped to him. The customer's name appearing on the suppliers order determines who should get the material. In this manner the supplier, the customer and our office can all cooperate to expedite the same order, should pressure make this necessary. Meanwhile the lesser parts of the clients' orders are filled, placed in small trays and put away to await the arrival of the rest of the order from our suppliers. This system is used only if more than one item has to be waited for; and there is no use in shipping the lesser amounts. Normally, whenever merchandise is received from the suppliers, it is shipped promptly and thus the customers do not wait.

To keep up with the supplier's situation as well as our customers' orders, a good memory is needed plus a system. With the "line-of-

merchandise" cards mentioned above, it is a simple matter to riff through these cards once a week, then get on the phone to the suppliers and keep the ball rolling! It has been this, plus the fact that lumping the small orders make sizeable stacks with good, high priorities, that has enabled us to get the material rapidly, and has given us better-than-average results in the matter of delivery.

On those customers whose credit permits their being sold on "open account," we keep the normal and quite the usual set of books. However, the filling of "open-account" orders does not one whit differ from our other business which is all on a cash basis.

Perhaps a bit of information on the premises from which we operate would be of interest. We occupy two floors. On the first floor is our store, our stock and our shipping. On the second floor we have our offices and some other small stock space. There are two executives; besides the author there is his brother, Abe Poncher. We started in radio business in 1931 and purchased our firm, Newark Electric Company in 1934.

Talking generally, we feel that the greatest shortage is in tubes and transformers. Actually, there is a shortage in almost every type of radio component and this varies from day to day and from week to week. Still our outlook "for the duration" is very good. We believe that we have filled a very necessary niche in the war production picture; and we feel that the Post-War picture will be good also.

In Post-War we have made no definite plans other than we shall again back the radio amateur to the hilt. We are not forming any "salvage plans" because we think the Post-War radio picture has yet to crystallize. We feel that after the War, the licensed radio amateur and the hobbyist will come back in greater numbers than ever before; and that it will be only a matter of time before he will be on the air with his own FM and television which, in itself should boost the both of these along tremendously.

We plan to handle FM converters and FM receivers and also some Sound Systems. These are about

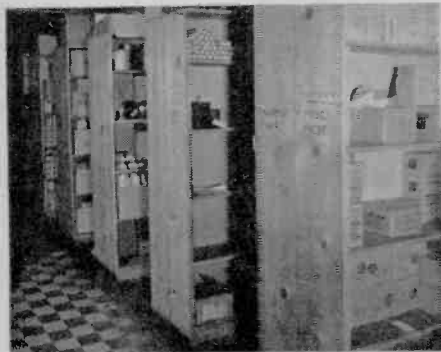
the only non-"ham" units to which we are committed for Post-War.

We have nothing, usually, for the serviceman except an exquisite assortment of condensers, resistors, exact replacement transformers and all the other parts that he finds so difficult to obtain from other jobbers. The only thing that we do, is to charge the serviceman the same as we charge any other client. We have never made any exception to this and we plan no change. It is not that we do not want the serviceman's business, but that our cash business plus our 10,000-item stock makes it imperative that we keep our bookkeeping to a minimum. With one discount for hams and another for the serviceman, the problem would become too complex.

Incidentally, the plans of any jobber for Post-War depend upon how fast the parts manufacturer gets back into regular production, and how fast he can make, or get ready new items. After the manufacturer decides what he will release, it is a question how soon he can publish his new catalog. The reason for this is that the jobber must obtain information for his own catalog.

We look for a depression from the time the war ends to the time when the above can be done. This depression will not be severe enough to hurt anyone as there should be enough sales to keep the average jobber going until the reorganization plans have been completed and carried out.

Together with many other jobbers
(Continued on page 28)



Wooden bins hold most of the stock, and are found in a hall-way to the shipping room; contain 10,000 items



The office upstairs is manned by two efficient girls who do all the letter-writing and the bookkeeping

TELEVISION



CAN MAKE YOU A BIGGER MAN

YOU radio servicemen and dealers of yesterday and today have a great *tomorrow* ahead of you! TELEVISION—the art of transmitting sound and sight—will open up opportunities for you to surpass your pre-war experience with radio—the art of transmitting sound alone.

Are you preparing yourself *today* for that *tomorrow*? Others are. Don't *you* miss the boat!

For instance, have you a copy of "PRACTICAL TELEVISION by RCA," the comprehensive, 40-page booklet, now reprinted in its 3rd edition especially for you? Have you familiarized yourself with the television receiver design, installation, and service information, the page of television definitions, and the 62 diagrams and other illustrations which this down-to-earth guide contains?

If you haven't a copy, get one today. Ask your RCA Tube & Equipment Distributor for one. If his supply has run out, write to us—Room 301, RCA Victor Division, RADIO CORPORATION OF AMERICA, Camden, N. J. There are dollars-and-cents reasons why you should have a copy. It's meant for you. It's another RCA service to help you help

yourself to a bigger slice of tomorrow...and the price is only 25c per copy.

Remember, *the Magic Brain of all electronic equipment is a Tube...and the fountain-head of modern Tube development is RCA!*



RADIO CORPORATION OF AMERICA

RCA VICTOR DIVISION • CAMDEN, N. J.

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

Shop Notes

Data presented as "Shop Notes", contributed by service-dealers as a result of practical experience, is carefully considered before acceptance. We believe it correct but we assume no responsibility as to results.

Card 1

RCA MODEL BT42, CHASSIS 408A

When changing over from the "G" type tubes with which the set comes equipped to "GT" tubes with metal bases, disconnect condenser C-16 (400 mmfd) and resistor R-7 (1 megohms) in plate circuit of the 1 H 5 that uses pin #1 of the 1 N 5 tube socket as a common connecting terminal. In the "GT" tubes with metal bases not changing these connections will result in a shorted plate voltage for the 1 H 5 tube and a very dead set.

Submitted by Warren J. Daugherty

Card 6

ZENITH MODEL 5G504, Chassis #5A03

Dial slippage, in this receiver, ordinarily is corrected by applying proper tension to the dial cord. In some cases, however, this does not entirely correct the situation, which isn't entirely cleared-up until another cause of trouble is removed—binding of the condenser gang rotor.

The first step is to clean and lubricate the gang rotor bearing. If this doesn't do the trick, apply a light outward tap, at the rear gang bearing plate, which will loosen the bearing.

Zenith Shop Notes

Card 2

BRIGHTENING SOLDERING IRONS

Wipe the end of the hot soldering iron with a soft wet (quite) cloth quickly so that the water turns to steam. The steam will break down the oxidation and a bright iron will result.

Submitted by Lucille F. Murray

Card 7

PHILCO 90

Trouble is excessive distortion. Check for leaky grid coupling condensers or leaky tone control condensers in the 47-tube power output stage.

Submitted by Robert Manning

Card 3

KILLING RADIO IN COMBO SETS

Sometimes there is seemingly no place where the radio set will be dead so that a phono pickup working into the audio end of the set can be used without interference. To "kill" the radio input when using the phono input as above described, bend the tuning condenser plates so that they short when set at the extreme low (full in) frequency position.

Submitted by Spears Radio Service.

Card 8

RCA-VICTOR MODEL T6-9

Hum at low volume can be cut by adding additional filtering in power supply. Hum when off a station and volume advanced may be cut down by grounding both ends of the shielded lead going to the 6F5 grid properly. Dead set is commonly due to shorted condenser in 6F6 plate circuit, or C-25 or C-26. Tunable hum is due to open electrostatic shield. Line condensers will cure this trouble.

Submitted by Robert Manning

Card 4

ZENITH MODEL 4K600, Chassis #4B01

A "high power factor" electrolytic condenser may be the cause of birdies and oscillation on stations, in this set model. A correction is to replace the defective component with an electrolytic of lower power factor, Zenith Part #22-1176.

Zenith Shop Notes

Card 9

BEAM POWER TUBES IN SMALL SETS

Beam power output tubes in small sets often become gassy, causing "mushy" tone quality after a few minutes of operation. This condition can often be corrected without replacing the tube by lowering the value of the grid coupling resistor. Use the highest value that will give satisfactory tone. It should not be necessary to go below 100,000 ohms.

Submitted by Spears Radio Service

Card 5

STROMBERG-CARLSON 10

Trouble is weak oscillation. Look for open resistor across primary and audio input transformer, or open 0.3 mfd. condenser in screen circuit of 1st R.F. amplifier.

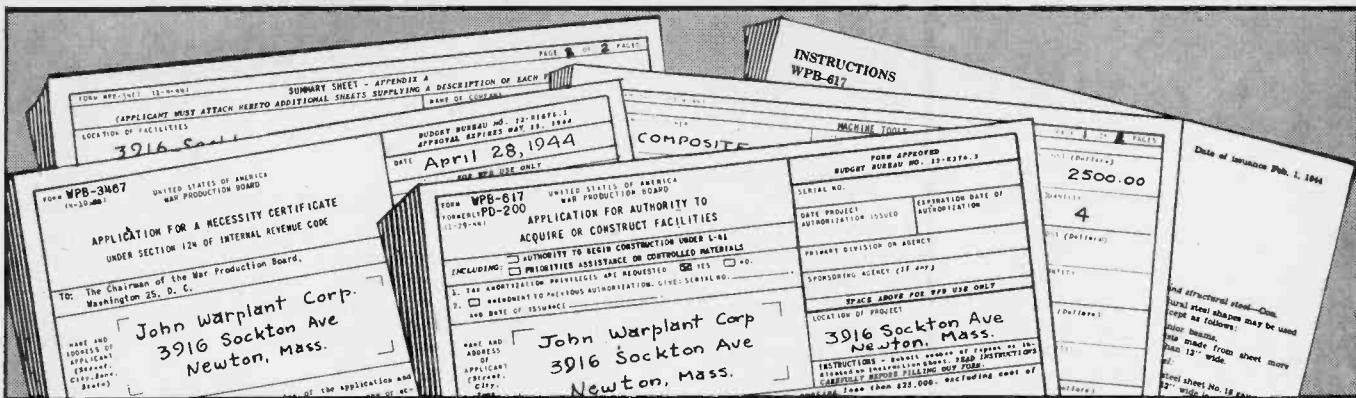
Submitted by Robert Manning

Card 10

ZENITH SETS WITH TUNING EYE

The tuning eyes do not operate. Check the resistor of 1 megohms in the tuning eye socket which will usually be found to be open or burnt out. Replace with new resistor.

—From Zenith Service Hints



How to Fill Out the WPB-617 Form

ASSUMING that the jobber has contacted his customer and has been instructed to proceed with the installation of a Paging and Sound System, the next problem is to obtain WPB approval and authorization. This is both necessary from the point that these systems have been prohibited since February 1, 1944 by the WPB "Construction Limitations" Section L sub 5, and also because the priority rating is obtainable only from the WPB on filing form WPB-617.

Certain formalities exist with regard to the completion of the form which will require the close cooperation of the customer; but at the same time, the jobber should, as a service, fill the form out for his client. There may be entries which the purchaser will not want the jobber to know, and so a fine touch must be used not to seem to become a "Paul Pry," and to let the buyer fill out that which is confidential and, of course, do the mailing.

It is well, however, to apprise the customer of the fact that the System cannot be installed without the WPB authorization, and that the jobber should be notified on the first opportunity when this has been received. The "green light" from the WPB will ordinarily come through on both a form GA-1456 (Waiver of Limitation) plus the usual priority blank duly giving the project its rating and the authority to proceed with construction and installation.

It may be well to say at this stage, that these very general instructions are based on information received from WPB Headquarters during the month of April, and that there is no guarantee that the rules may not be changed before the reader has occasion to use them. It would be best to consult, briefly, with the local WPB representative merely to check that there have been no alterations to the Form or its

completion. However, all things being equal, the method of filling out the Form and the answers presented herewith, should act as a fairly competent guide for the jobber and his clientele.

The First Step

Obtain either from the WPB local Field Office or from WPB Washington, by writing, 6 copies of form WPB-617 with "Construction Limitation" inserts and 6 forms of WPB-3467 which should have 2 copies each of Appendix A" which in itself consists of two sheets. They are identifiable by tiny numbers appearing in the lower right-hand corner under the guide line, as "GPO-War Board-9301G" and "GPO-War Board-9302G." With each WPB-3467 two of each of the "Appendix A" forms will have to be filed. If the customer desires installation in more than one plant, a separate set of forms as above will be required for each plant location. A separate location is one where the buildings are not in the same locality, but should not be confused with a group of buildings all on a single or adjacent plots.

The jobber should ascertain from his buyer if he will want to amortize the depreciation of the Sound System for tax purposes. If the answer is "No," then form WPB-3467 and its "Appendix A" can be entirely disregarded. In this case only 3 copies of WPB-617 shall be filed. As a rule, however, the war plant owner will want to amortize the installation and so the WPB-3467 will have to be executed. But first, the WPB-617 will be discussed.

Filling out the WPB-617

A necessary adjunct to form WPB-617 is a letter addressed to the War Production Board which "explains" the application. It may be composed of numbered paragraphs which correspond to the numbers appearing in the

form under Section A thereof. However, before starting the letter, the form itself can be executed insofar as possible.

It is probable that the plant owner will have to decide for himself whether he will want Tax Amortization privileges or not. How he should proceed if he feels he wants this privilege, is taken up at the end of this article; but if he feels that the cost of the Sound System is too low to bother with, then he will answer "No" in the square provided for that purpose under 1. If he answers "Yes," he will have to execute form WPB-3467 and attach it to this application.

The jobber should, before giving the form to the owner to fill out, fill in with an "X" the box indicating that "Priorities Assistance or Controlled Materials" will be required. This will indicate to the WPB that a rating is requested, and one will be assigned. This can be passed on to the manufacturer of the Sound System for his use in obtaining the necessary component parts and material.

If the application is an amendment to a previously filed form, that should be indicated in the square directly under 1 and marked with the number 2. This would only be used where the owner had decided to change the system for one a bit larger or extensive. Otherwise this should be ignored.

Next insert the name of the applicant, which should be the owner, whether it be a corporation or an individual, owning or operating the war plant. The location of the plant is placed in the square directly to the right of the plant owner's name and address. Here also should be placed the exact address of the plant. There are cases where the plant is located at a distance from the main offices, sometimes in a different part of town or even in a different city. The name of the applicant is the owner and his address, the project location is the

A pre-requisite to selling Industrial Sound systems is permission from the War Production Board. This is obtained by having the customer fill out Form WPB-617. Exact instructions are given

address of the plant regardless of whether they are the same or different.

Since it may be assumed that the average Sound System will cost under \$25,000, the jobber and the owner are only concerned with *Section I*, and that only need be executed.

Leaving the *Section I* to be answered by a letter as previously explained, move down to *Sub E* and write across it, "Not Applicable."

Under *Sub F*, since most Sound Systems will be installed with other than Federal Funds, column (a) can be ignored and the cost of the equipment—the capital cost, without installation costs, but including the cost of the hook-up wire, should be entered in column (b) marked "Other Funds" and the extension placed out in column (c) as a "Total." The cost "Excluding Land" is the same as the cost of the previously mentioned items, since land does not enter into the question, and the same figures should be entered in columns (b) and (c) opposite this classification.

Sub G is divided into two sections. The first concerns itself with the "Number of days between WPB authorization and the start of construction—Installation of initial installation" and secondly with the "Number of days required for actual construction and equipment installation." The jobber should indicate the day he expects to start construction of the equipment (the start of installation) and the finish of initial equipment installation. The Sound System manufacturer will give the jobber the number of days required for delivery after receipt of priority and order. This time elapsed plus the time for the jobber to start, actually, the installation is the answer to put in column (a) of *Sub G*. The number of days after receipt of WPB authorization and the finish of the installation is the days to put in column (b) *Sub G*. Thus the time elapsed between the days mentioned in *Sub G (a)* and *Sub G (b)* should represent the actual installation time, while the "days-time" mentioned column *Sub G (a)* shows how long after receipt by the jobber of the equipment itself from the Sound System manufacturer it will take, from the date of WPB approval.

In *Sub G (c)* enter "Not Applicable," since the jobber does not build the Sound System equipment. This will be correct unless he actually does the assembling of the components himself. In *Sub G (d)* enter the actual days the jobber's service department will require for the installation of the Sound System. This should correspond with the

difference between *Sub G (a)* and *Sub G (b)*. If it does not, an explanation should be included in the letter which accompanies the application.

Disregard all of *Section II*, marking across it, horizontally "Not applicable."

Under *Section III* a careful itemization is requested of the entire Sound System installation. Thus in (a) enter the trade name of the system, and break it down to the component subdivisions. For instance: *Amplifier*, or *Factory Sound Amplifier*. Also in this column should appear the accessories; for instance: *Microphone*, *Record-Changer*, *Radio Tuner*, *Paging System*, or *Selective Remote Control Box*. If the whole System is sold as a unit, it need not be broken down. But if it is an assembled job, each main component must be mentioned. This will include speakers, etc.

In column (b) enter the model number and make. Thus of the amplifiers one should enter the manufacturers name and number. For instance: *Meck* (amplifier) or *General Electric* (amplifier), *Turner* or *Astatic* or *Electro-Voice* for the microphone, *Webster* or *General Industries* for the record changer, and *RCA* or *Meck* for the remote control box as the case may be in the illustrations above mentioned. Again, if the unit is sold as an entirety, the make of the whole unit and its model number only need be included in column (b). Otherwise it will be necessary to give the manufacturer and model number of each component part. Wire is excluded from this category.

Under column (c) enter the size and capacity. Thus in the case of an amplifier, the wattage output would be correct. In the case of speakers, the power capacity would be right. With remote control boxes or microphones nothing need be entered here. (Possibly the number of circuits for the remote box might be considered and entered as "7-line"; but this is believed to be optional).

Under column (d) enter the quantity required for the installation. That might be *1 amplifier*, *7 microphones*, *10 speakers*, *2 remote control boxes*, for example.

In column (e) enter the price for the installation not counting the labor nor the wire cost. If a figure has been submitted which is a total-unit-cost, it is not necessary to break it down to prices of the respective sub-components. Merely enter the total cost at the bottom of the column for the entire installation, but do not include the cost of wire nor labor.

Put in column (f) the number of

weeks the owner has allowed the jobber to complete the installation. If not in weeks be sure to add the word, "days" after the time.

Column (g) is for WPB only and should be left blank.

Have the owner sign the application at the bottom where indicated and proceed with the letter which must accompany the application.

Writing the Letter

Referring now to *Section I*, the letter should be numbered to correspond with the numbers appearing in *Section I* of the application.

Start the letter, "Dear Sirs," as if it were a regular letter; then put the letter "A" in the margin and go ahead.

Under "A" give a brief description of the work to be done by the Sound System. Describe the effect on absenteeism, fatigue and the increased efficiency of production, as well as the time saved in getting around the plant by the Paging feature. A typical paragraph might read:

Sound System is requested for the *ABCD Manufacturing Plant* to help with morale of the employees. By using music in the fatigue periods, the work is increased, and the production of war work is accelerated. It is well-known that music aids in places where concentration is required, and the type of products manufactured by the *ABCD Company* is of that nature. In addition, the saving in time when the System is used as a paging device is considerable. The fact that news reports and morale-lifting speeches can be relayed over the System, is another superlative feature. Tests have shown that music is a necessary adjunct to good work in these times of stress and nervous tension. The use of Sound Systems in war plants is well recognized.

For the paragraph A (1) (a) write, "Not applicable."

For paragraph A (1) (b) describe how the System will fill the needs of the particular plant in question and how many employees will benefit therefrom. A typical answer would be:

Our plant employs over 175 men and women in three shifts in 8 hours each. There are those who have left their homes in order to assist in the war effort. Their minds are necessarily taken up with their work, but their homes are also a consideration. In this type of conflict within, there is bound to be tension. Music will relieve this and enable a smoother production curve.

In the plant there are many departments which are considerable distance from each other, often with other departments interspersed between. Men go from one to another department. They should be reachable for consultation or phone calls. We have been using bells, but these are very unsatisfactory. With the Sound System in question we will be able to page these men at will. The music would be interrupted only long enough for us to accomplish this.

There is great need to keep the people well-informed of the war. To that end, we are including a radio tuner in our set-up,

(Continued on page 12)

FILLING OUT WPB-617 FORM

(Continued from page 11)

and with the Sound System plan to give our employees world news and National announcements whenever they seem to be important.

In an emergency the Sound System is without equal, since we will be able to instruct all of our employees at once over it.

Whenever it seems necessary for morale-lifting speeches to be "broadcast," the System will lend itself to this purpose. It is planned to use it for this, and to have the key officials address the employees from time to time on pertinent plant matters, as well as to promote War Bond Purchases, etc.

Since we do not now have such a System, this application is being filed.

For paragraph A sub 2, write, "See explanation above in paragraph 1," adding:

The winning of this War is the prime effort of our people. Much has been done for the physical well-being of our workers. They have all sorts of health devices, many of which are free for the asking. Not too much has been done for their mental attitude. Since the morale of the worker directly reflects itself in the output of the plant, it is felt that this Sound System, and the music it will bring to the workers, will directly help to keep him in a better frame of mind and keep his morale high. That music can and does do this is attested to by most psychologists charged with the welfare of factory employees. It is also well-recognized that the health of the employees is paramount. It can be kept in good state by music in the plant.

Under A (2) (b) state that, "The project cannot wait for the duration, since it is needed for the war effort."

If a previous application has been made to any Government agency, so state in the letter marking it B (1) and (2). If none has been made say so generally marking the paragraph as mentioned above. For paragraph C (1) state that the installation is "New."

Arriving at paragraph 2 (a), describe the System in detail. Give technical facts such as the coverage expected; and include a rough layout of the plant. This need not be in detail, but merely to show where the speakers will be mounted, the area each will cover, and the various departments which will benefit therefrom. Include the placement of the amplifiers and the microphones. A pencil sketch will suffice. For (b) give a general de-

scription of the structure of the plant. Say that it is, "a loft building" or a "Concrete new building, or a "Fire-proof 1-story building."

Describe the extent of the installation. How many speakers will be used, how many "boosters" or amplifiers located where, how many microphone stations and how many employees the system will serve. Show how and where the wiring will be laid. Thus: "Open, double-cotton covered wire will be used for inter-connections." (Note: Rubber-covered wire is prohibited, except in water-repellant situations!) Advise how the microphones will be installed, "On desks of important key personnel," or "a floor microphone will be installed in the conference room for use by Morale-Lifting Units of the Services," etc.

Under sub (c) write, "Not applicable."

A waiver is required in view of Section L sub 5 of "Construction Limitations" as issued February 1, 1944. This waiver should be applied for in the next paragraph of the letter and marked with the number D. Suitable mention can be made in a simple paragraph reading much like this sample:

Since a waiver is required under Section L sub 5 of the Construction Limitations for a Sound System for this plant, and since this entire application is meaningless without the granting of such waiver, the said waiver is hereby applied for. The very reason for the submission of this form WPB-617 is predicated on a request for a Sound System, and without the waiver, it could not be granted.

Attention is called to the fact that by Section K sub 2, rubber-covered wire is not permitted in the installation. There may be conditions where it is necessary, however. Such a case might be a plant where there is much steam or where fumes from plating will flow over the speaker wires. Here it might be possible that ordinary wire covering would not stand up, and rubber is the only thing which would do. A waiver should be sought for it. A paragraph like this might serve:

The ABCD Plant specializes in plating and the fumes from the plating tanks will necessarily have to flow over the hook-up and connecting wires. Ordinary wire covering will not withstand such wear, and our Chief Chemist has advised that rubber-covered wire must be used in order to protect the wire itself. A waiver of Section K sub 2 respecting rubber-covered wire is therefore sought in connection with the installation of the Sound System applied for. It will be used only where the connection wire is so placed that it will come in contact with the plating fumes. It is not feasible fumes cannot reach the wire; and to do so

would entail extra-ordinary expense beyond what is reasonable and prudent. No substitute for rubber-covered wire exists that is in any way easier to obtain or more plentiful.

The letter should be terminated with a short statement something like this:

In view of the facts submitted in this letter together with the form WPB-617, it is respectfully urged that the application for approval of a Sound System as described in the WPB-617 be granted to this firm.

Very truly yours,

The letter should be written with as many copies as there are forms, and attached to the inside of the WPB-617. It should be separately signed in the firm name by an official of the firm.

Four copies of WPB-617 are generally required. If the Tax Amortization Request is filed, file the original and three copies with the WPB in Washington. If no Tax Amortization Request is used, file two copies and the original. An extra copy of each should be made for the jobber and the owner. In this manner both can follow-up the form. (Note: Even though the form says that without Tax Amortization Requests, the form should be filed with the local Field Office of the WPB, latest advices indicate that all WPB-617 forms are to be filed in Washington. It would be wise to check with the local Field Office of this before filing, as it may have been changed again.)

For those plants where Tax Amortization Request is desired, this form will now be taken up.

Filling Out Form WPB-3467

It may be well before leading into the execution of Form WPB-3467 to discuss briefly and momentarily the question of Tax Amortization. Heretofore, the Tax Department has permitted 100% amortization over a period of 60 months for war plant installation and equipment. This has been tightened considerably until the maximum amortization allowable has been reduced to 25%-35%. This percentage of the total capital cost can be taken at the rate of 1/60th in each month for five years or to the end of the war whichever is sooner, or in any other proportion not to exceed the 1/60th per month rate. Thus it could be taken at 12/60 per year, 3/60th per quarter, etc. The rate of depreciation is entirely at the election of the plant owner, so long as it does not exceed the rate mentioned above.

However, should the war end either sooner than the 60-month period or

(Continued on page 26)



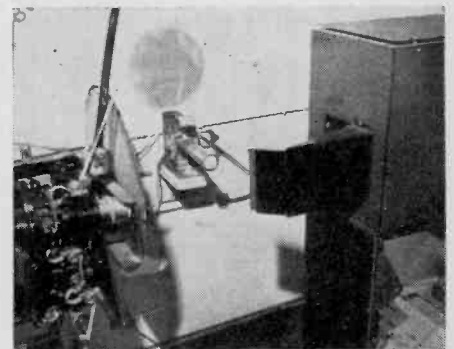
ACME PHOTO

Not new, but coming into more general use is the lie detector. This instrument is an electronic apparatus



ACME PHOTO

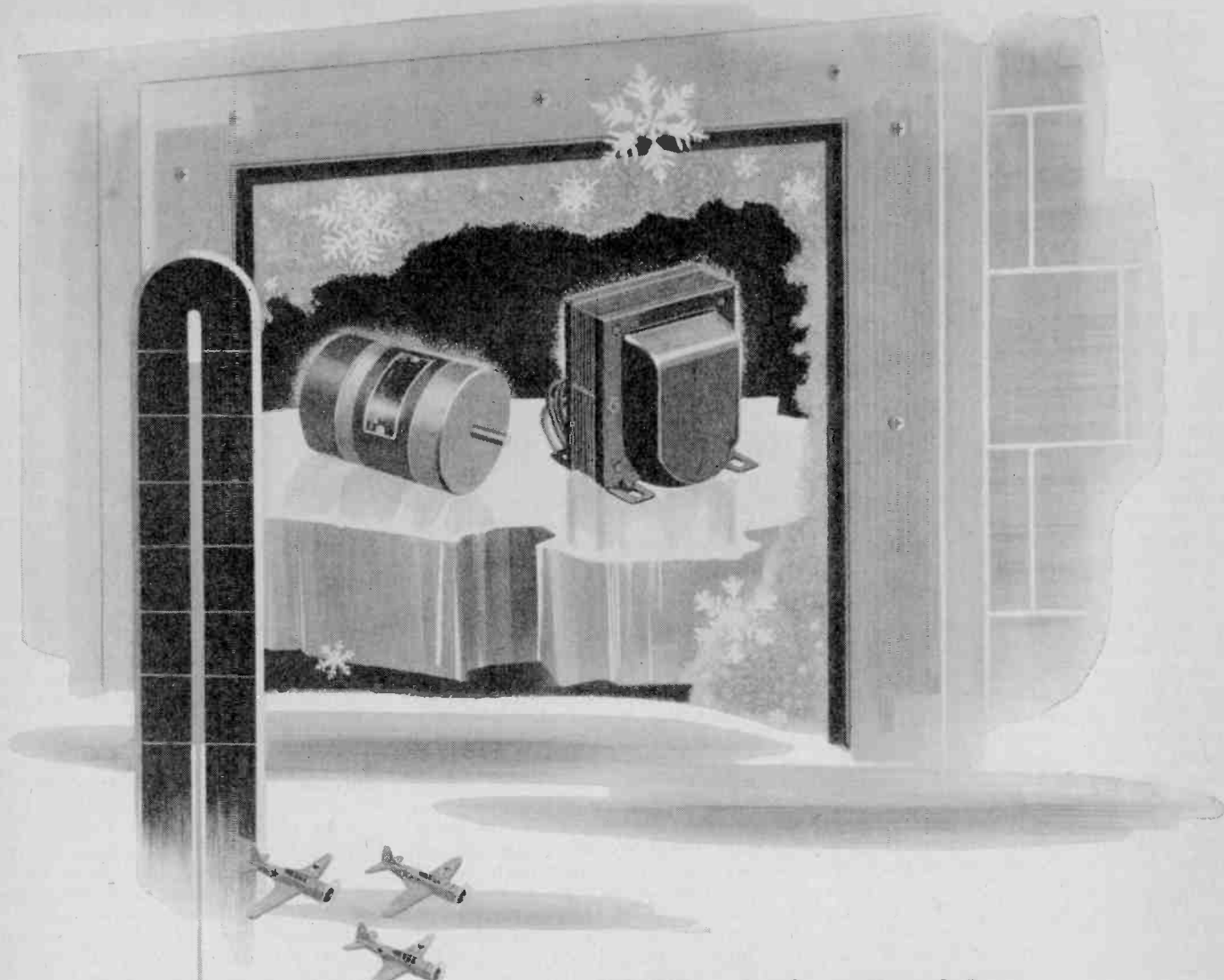
Samuel Berman of N. Y. demonstrates his electronic metal locator which is seeing extensive medico-war use



ACME PHOTO

Televising a motion picture is done with this setup. Slide lantern is to interpose "stills" during performance

Radio Service Dealer



140° cooler inside

There is a piece of the stratosphere just beyond that glass door. The air pressure is less than one-fourth of normal air pressure. And the temperature is 70 degrees below zero.

The Utah parts being tested are proving that their performance will be "as specified," whether they are to operate on the ground or high in the air.

This and other tests which parts undergo in the *complete* Utah laboratory are particularly important in adapting the new electronic and radio developments—in making them militarily and commercially usable—now, and tomorrow!

★ ★ ★

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

Utah

Radio Products Company,

836 Orleans Street, Chicago 10, Illinois



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

A-M Answers the Challenge of F-M!

by Karl A. Kopetzky

Managing Editor

How A-M stations may meet challenge of F-M broadcast

THE scene is in a hotel long since demolished in Minneapolis, the speaker is "Beep" Phelps, W9PB, now a Lt. Commander in our Navy, the subject is "Plural Modulation." Phelps is demonstrating. He tunes one radio station on one set, then another on a second set and a third on a third different set. Each is carrying a different program on a different wavelength or frequency. Next he switches each program into a separate microphone transformer of a small radio transmitter of about a half-watt output power operating a 1000kc carrier. He does this with all three until they are each being sent into three different audio channels of a single transmitter. Then he turns on a regular radio receiver with a small converter in front of it, and proceeds to disentangle each station and bring it out clear and loud on the one same receiver. Thus he put out three audio signals on the same band and unscrambled them at the receiving end.

That was the end of the demonstration. Too few of the amateurs assembled thought anything of the scene. It was, to them, only a trick. But really it spelled the answer to the over-crowded spectrum after the war—it was the answer to FM!

What Phelps had done was to impress each audio signal on an "intermediate modulating frequency" and modulate the final amplifier with some high frequency which was one of the intermediate frequencies of the receiver in question. Thus the audio band covered the range 100-5000 cps while the "modulating" frequency was, for each of the three

signals, 465kc, 375kc and 175kc. By means of a variable *IF* converter he picked off the *IF* stage frequency at respectively 465, 375 and 175 kc and then tuned in on the carrier frequency of 1000kc re-converting it to the *IF* frequency of the superheterodyne end of the receiver and demodulated it in the second detector. That gave him the audio signal which was heard in the loudspeaker.

While this is only a sketchy outline of what occurred, still it serves to show that the field is wide open and it has not been even touched.

What this can mean to the radio spectrum in AM transmission is enormous. Conceive, if the reader will, that the "clear channel" frequencies are too few and that there are more stations than there is room at present. Allowing for a 10KC wide audio channel in the spectrum as we now know it, there is room for only 106 stations. There are, of course, many more than that—about 911, in fact, according to a recent statement by RCA. They "share" frequencies as well as operate on non-interfering reduced power. With plural modulation, allowing for a "modulating frequency" of from 175KC to 1600KC there would be about 133 "modulating" frequencies of the first order available, or a total of 14,098 clear channels available for AM broadcast stations!

Supposing that "secondary" modulation were used—that is, "plural-plural" modulation, there would be 91,881,604 clear channels available. If "plural-plural-plural" modulation were done, there would be the astronomical number of 8,442,229,153,712,816 clear channels! That is probably more than all the radio stations in the world today! And the

limit is not yet reached!

What can this mean to the radio set owner in 19XX? Just this. It will be possible to have a set of buttons for each part of the world. Thus four buttons might control the US, —eastern, midwestern, rocky-mountain and western. Four more might bring in Europe. Five the Far East, six—South America and maybe two Africa. Then there would be buttons for certain types of entertainment. One for swing music, one for classical operas and one for news; one for weather, one for plays, one for political and one for foreign news. The radio might become like a newspaper. You push the button and you take your pick!

With the new anti-static invention recently publicized by Goodyear, plus the "plural modulation" there is no reason to wish for FM. FM brings out two things in essence. One is the clear, static-free reception; the other is that many small stations are possible because of the broad coverage with small power.

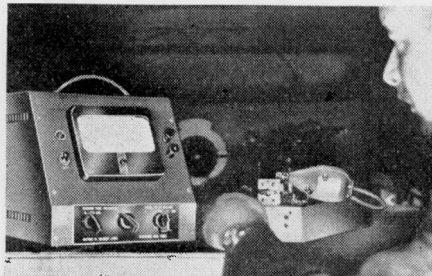
With anti-static to meet that feature of FM, there is only the ability to cover small areas without interference to answer the challenge of FM. With some 8-billion million clear channels, there is no need for any community to go without radio of every sort. Also, the radio might with "plural modulation," replace the telephone.

There is a Western Electric invention which rings a bell at your radio

(Continued on page 28)



A Civil War vet sees how it is done today. In his war they used couriers



Alfred W. Barber Labs' high-frequency probe and their unique V.T.V.M.

This article is not as unreasonable as it might sound to the "pure" serviceman. While some of the "bugs" have not been explained, such as how the various frequencies are kept from heterodyning one with the other, still the author actually saw the system in action. There is no doubt that something will evolve which will prevent the scrapping of some 60-million AM receivers and will relieve the present broadcasters from loosing the greatest part of their investment—something which would take place were FM stations to become the only means of broadcasting.

The Editor



KEITH
THOMPSON

History of Communications Number Four of a Series

SMOKE SIGNAL COMMUNICATIONS

While the puffs of our early American smoke Signals were not as complicated as the Morse Code, this type of communication was a speedy and effective means of communication at that time and could be seen for scores of miles on a clear day. Used for transmitting their battle messages, smoke signals in the days of the early American meant a progressive means of communication.

Restricted by climatic conditions this type of communication was limited in its use. Universal microphones in the part they play in modern electronic voice communication must withstand the climates of the Arctic and the Tropics all in a day's work. Built to accomplish a specific job, Universal Microphones are "getting the message through" on every Allied front.

Model T-45, illustrated at left, is the new Lip Microphone being manufactured by Universal for the U. S. Army Signal Corps. Shortly, these microphones will be available to priority users through local Radio Jobbers.

UNIVERSAL MICROPHONE COMPANY
INGLEWOOD, CALIFORNIA



MODEL T-45
LIP MICROPHONE

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

A Simple Tube Rejuvenator

by H. L. Carpenter

How to build a tube rejuvenator which can be assembled from "junk-box" parts. Thirty percent tubes can be saved

SINCE the beginning of the tube shortage, nearly every magazine read has mentioned the fact that some tubes may be saved by welding together the burned out heater with a high voltage spark coil. All of these articles mention the old Model "T" Ford coil. These coils are not as plentiful as they were a few years ago and in addition, something else is needed besides this high-voltage spark, to do a good job of welding.

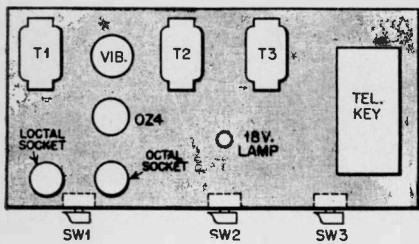
In my first attempts at tube salvage I used a neon transformer without any additional voltage. I saved a few tubes. However, the percentage was very small. This was encouraging; so I added a filament transformer to my set-up so the proper filament voltage would be ap-

plied as soon as the sparking voltage was removed. This raised the average from about two per cent of the tubes attempted, to about fifteen per cent.

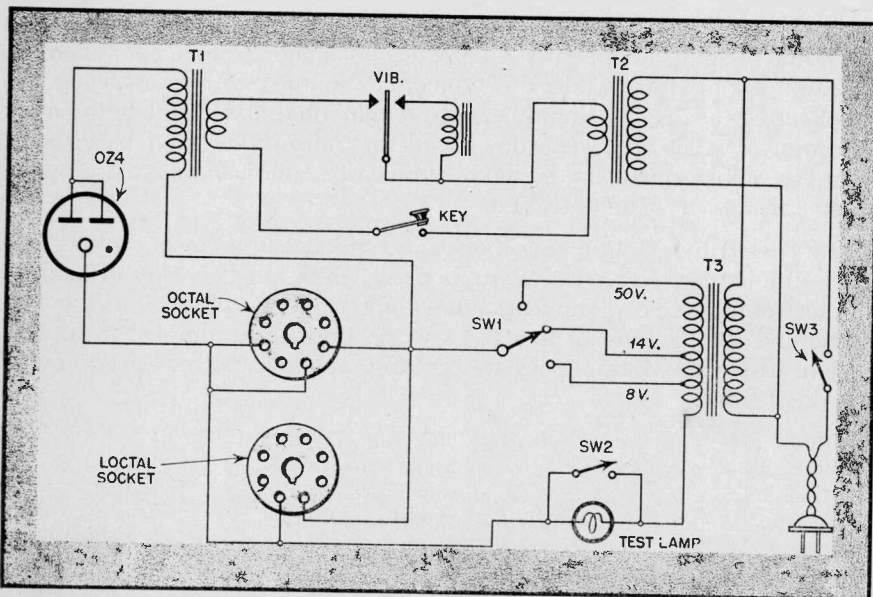
After salvaging approximately fifty tubes in this manner I decided to use a DC arc for the flashing process so I inserted a OZ4 tube and changed from the neon to a vibrator transformer with a vibrator in the primary circuit. This method will salvage about twenty-five to thirty per cent of all burned out tubes, even some of the six volt heater types.

Construction

The unit is constructed on 7"x12" metal chassis. Placement of parts may be to suit the individual taste, although the drawing shown is very suitable. The vibrator is of the primary type (non-synchronous). Transformer T1 may be either a vibrator transformer or an automobile coil. Transformer T2 was taken from an old AC self-powered, dynamic speaker. It can also be any eight or ten volt transformer capable of delivering a moderate current. T3 was a filament transformer from an old tube checker.



Suggested layout for rejuvenator



Circuit diagram of the simple tube rejuvenator

If one is not available, remove all except the primary winding from a power transformer, counting the turns on the low voltage windings to determine the turns per volt of the primary. Put on a new winding, using No. 22 or No. 24 enameled wire, to deliver voltages of 50, 14 and 8 volts. These voltages will be slightly higher than the tubes' rated voltages and will make the weld stronger by producing more heat. The key is an ordinary telegraph key or may be a SPST switch. The test lamp is preferably an 18 volt bulb such as is used in pin-ball machines. A 6-volt lamp may be used on the lower voltages but the surge on the 35 and 50-volt tubes will burn it out. The octal socket has pins 2 and 8 connected so that a 12SQ7 will fit the same socket as the regular types.

Operation

Turn on switch 3.

Select proper voltage with switch 1.

Insert tube in proper socket, leaving switch 2 open.

Close key and hold closed for a few seconds or until test lamp lights.

If test lamp does not light immediately, tap the tub lightly with a rubber hammer while holding key closed.

After test lamp lights or, in the case of glass tubes, the heater lights, open switch 2. This raises the voltage applied to the heater and strengthens the weld.

After tubes are placed in operation they should be turned on for a few hours before delivery to insure continued operation. If the tube is going to burn out it will go within a few minutes.

\$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.

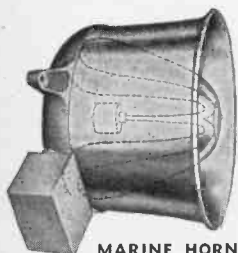


The Famous Three!

Tinker, Evers and Chance were famous for Stamina, Efficiency and Fine Performance. So are all RACON Products!

There's a RACON speaker, horn and driving unit for every conceivable sound distribution application. Only RACON can supply, when needed, another famous three-in-one combination — Weatherproof, Stormproof, Acoustic Material which is impervious to any weather condition and prevents resonant effects.

Now that industrial war plants can obtain sound installations, remember that RACON's should be used to afford peak efficiency.



MARINE HORN



RE-ENTRANT TRUMPETS



P.M. UNITS

MARINE HORN SPEAKERS, approved by the U. S. Coast Guard, may be used as both speaker and microphone. Available in several sizes.

RE-ENTRANT TRUMPETS, compact, of the double re-entrant type, afford long air-column in small space; deliver highly concentrated sound over long distances.

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

RACON ELECTRIC CO. 52 E. 19th ST., N. Y.

RACON

ELECTRICAL APPLIANCE

Retailing

Registered U. S.
Patent Office

REFRIGERATOR SERVICE HINTS

Reprinted Courtesy Philco Radio & Telev. Corp.

Evaporator Temperature

With the unit operating normally and a part number T-33-1 thermometer properly frozen in on the bottom of the evaporator a temperature of 8 degrees below zero should be reached. This reading should be made between thirty minutes and an hour after the unit is put on test. Continued operation of the unit under extremely adverse conditions may cause higher readings on a unit than is normal.

Restriction Before the Capillary

In the case of the restriction before the capillary the only actual effect is that of slowing down the entire movement of refrigerant. The charge of refrigerant is sufficient so that the evaporator is full at all times, thus causing it to frost evenly to whatever extent the reduced capacity due to the slowing down of circulation will allow.

By virtue of slowing down the movement of refrigerant in the sys-



"Hello, Appliance Store? Your repairman insulted me! When I told him I wanted plenty of light—he said that my power was extremely limited!"

tem there is a tendency toward filling the condenser, or at least the lower passes of the condenser with condensed liquid. This liquid cuts down the efficiency of the condenser by cutting down the amount of area of the condenser that is devoted to removing heat from the vapor that is being pumped into it. The ultimate result therefore is much the same as if possibly one-half of the condenser was covered so as to stop the flow of air through that portion of the condenser.

With the reduced capacity it is entirely possible that the unit will lower the temperature of the evaporator to such an extent that the unit will shut off if the temperature control is set on one of the warmer positions. If the unit does shut off the evaporator warms rapidly. However, since warm liquid refrigerant trapped in the condenser continues to flow past the restriction through the capillary and to the evaporator, it must be remembered at this point that we have two conditions that will undoubtedly bring about a stalling condition at each start of the unit. In the first case we have a rapid warming of the evaporator cutting down the off cycle. In the second case we have a restriction in the system that does not let the pressures in the system equalize as rapidly as they would under ordinary conditions. Therefore, it is entirely possible that the unit will stall at the beginning of each cycle until such time as the pressures have equalized.

With the reduced capacity it is quite likely that the unit will never pull down to a point where the temperature control will shut off on the colder settings. If it will, however, the on cycle will be unusually long as compared to the off cycle. In either case there will probably be stalling at the next start.

The cutting down of the efficiency of the condenser by filling a portion of it with liquid refrigerant has been mentioned. The extent to which the condenser is filled with liquid is apparent by feeling the various tubes of the condenser. At some point on the condenser it will be noticed that there is a distinct change in temperature. This indicates quite clearly the level of the

More on Universal's "U" Plan

Book of the month is Universal's dealer prospectus about one phase of the "U" Plan for "V" Day showing dealers how to set up the plan for their store and how to get ready for postwar selling. The elaborate 20 page portfolio shows how the "U" Plan will help the dealer business today . . . how the plan puts postwar business on the dealers books and indicates point-of-sale identification with national advertising through use of the free promotional kit.

Designed in four colors the "U" Plan prospectus outlines the way by which the dealer benefits from applying this down to earth formula of postwar planning and stresses the need for more dealer participation in war bond activities.

Full page spreads feature reprints of ads appearing in 14 leading magazines and the materials contained in the promotional package. Also included in the plan books is a set of questions and answers which further explain the "U" Plan for "V" Day to the retailer.

liquid in the condenser which in most cases will be found to be at least one-half way up on this part.

Restriction After the Capillary

It will be noted that the indication of restriction on the low side of the capillary tube will be very much the same as a restriction on the high side before the capillary tube. In both cases there will be reduced capacity with the result that the evaporator temperature will never be as low as it would on a normal unit.

There is one definite distinguishing point, and that is the frost on the capillary tube. Normally and in the case of a restriction on the high side there is a certain amount of frost on the capillary tube before it enters the evaporator, the reason of course being that expansion starts to take place before the actual outlet of the capillary tube. In a case of this kind, however, where the outlet of the tube is restricted, no expansion takes place before the point of restriction. The result is that there is no frost on the capillary tube itself.

There is sufficient refrigerant in a system of this kind, however, so that any frost that accumulates on the evaporator will be evenly dis-

(Continued on page 32)

SPRAGUE TRADING POST



A FREE Buy-Exchange-Sell Service for Radio Men

IMPORTANT NOTICE!

We discourage offers to buy or sell anything beyond the O.P.A. ceiling prices, and will not knowingly accept such ads for the Sprague Trading Post.

WANTED FOR CASH—Chart or copy of chart of #420 Triumph tube tester; V-O-M; and #9001 tube. C. E. Wiley, P. O. Box 268, Clinton, Miss.

FOR SALE—#1140S Superior tube tester; also Davrad set tester. Both in good condition. Set tester reads ac-dc volts up to 1250V, Ohms range, 3000; 3 meg.; 3 meg., also has ma. Hoffman Bros. Garage, Jasper, Ind.

URGENTLY NEEDED—Sig. generator with an r-f range of about 100 kc. to 100 mc., at least 1 modulation tone, preferably 400 or 1000 c.p.s., with switch to cut off modulation. John W. Butler, 424 Mansfield St., Belvidere, N. J.

WANTED—All-wave sig. generator, multimeter, and tube tester. Stanley Markowski, 420 Varick St., Utica 4, N. Y.

WANTED—RCA Voltohmyst, Jr. for cash. C. D. Hewitt, 60 Harmon St., Hamden 14, Conn.

TUBES FOR SALE: All Philco, most in factory-sealed cartons, but a few broken over for testing: 4-15; 2-19; 6-114G; 3-1A4; 5-1E5G-GT-GP; 3-1A6; 1-6L7; 1-1D7G; 1-1C7G; 2-58; 2-43; 3-35/51; 1-25A6G; 2-32; 2-6L6G; 4-1D6GT; 1-1H6G; 1-6J5; 1-6J7; 1-6J8; 3-1J6; 2-2A4G; 1-6; 1-57; 1-38; 3-71A; 1-34; 2-6A6; 1-26; 16B4G; 3-7A7; 1-7B7; 1-7C6; 1-7C7; 1-6X5GT/G; 1-XXD. Want to sell entire stock to one buyer. Morgan's Trading Post, Murphysboro, Ill.

WANTED—Will pay ceiling price for either or both Simpson Elec. Co. #510 sig. tracer and #410 Simpson sig. generator, complete. Geo. M. Brundige, 420 E. 5th St., Brooklyn 18, N. Y.

WANTED—Meissner training kit #10-1197, 6-tube ac-dc or #10-1191 5-tube ac-dc or similar models for training use. Frank Pontoreiro, 428 West Ave., Ext., Newark, N. Y.

WILL TRADE—A Supreme #502 tube & set tester (orig. cost \$49.50) for late communications receiver, preferably Hallicrafters. Gene W. Miller, 215 Phelps St., Watertown, N. Y.

FOR SALE OR TRADE—0-1500V dc voltmeter, Jewel 54 (broken glass); 0-20-200 dc milliammeter, Hickok; 0-300-600V dc voltmeter, Hickok; Pioneer 6V generator, model JW (needs brushes). Want critical tubes, also EC-1 or similar comm. receiver. Miles Specht, 242 S. Market, Wooster, O.

FOR SALE—Precision #500 tube tester in perfect condition; Rider's manuals 1 to 5; also odd lot of parts and a few meters, R.F. M.A., etc. A. W. Klein, 6708—6th Ave., Brooklyn 20, N. Y.

WANTED—Portable sig. generator and V-O-M. Must be fairly accurate and in good condition. J. H. Gann, Route #1, Alamosa, Colo.

WANTED—Test eqpt. and parts of all kinds for new shop. Cash. Thos Tercheck, 19312 Westphalia Ave., Detroit 5, Mich.

TUBES FOR SALE—1-6G7; 1-6G5; 1-6R7; 2-6K7; 1-6NTG; also Zenith battery radio. Want new tube tester. Also have mechanical drawing set for sale, \$11. Chas. Winn, Box 29, Tullahoma, Tenn.

WANTED—V-O-M or multimeter. Describe fully. J. H. Shartis, Dorsett Road, Maryland Heights, Mo.

WANTED—AC & DC volt ohmmeter and signal generator. Fred Young, 1318 Gay St., Huntington, Ind.

WANTED—Any type of short-wave receiver. Must have beat oscillator & elec. band spread. Also want any type volt-ohmmeter. Cash. Eric Palmer, Jr., 558 2nd St., Brooklyn 15, N. Y.

FOR SALE OR TRADE—78 r.p.m. record player motor and two 12" turn tables (Diell); Wood lathe, 42" Craftsman, belt & pulleys; Campbell X-Ray machine, oak cabinet, complete; 6V Pioneer gene-motor. Need Rider's manuals 6 to 12 in usable condition. All replies answered. Clifford D. Lessig, Frenchtown High School, Frenchtown, N. J.

WANTED—7" electrostatic television tube for cash. H. C. Brown, 2940 N. 26th St., Philadelphia, Pa.

WANTED—Capacitor analyzer. Plourd Refrigeration Service, McCook, Neb.

WILL TRADE Philco comb. table model, like new, or 2½ h.p. outboard motor for Hallicrafters or other good comm. receiver, or pay cash. R. N. Holsinger, 908 W. Main St., Charlottesville, Va.

WANTED—Small comm. receiver, any type. Also want small volt. ohm. multimeter, preferably pocket type. Pfc. James Smith, 34605219, 332 Base Hq. Sqd., A.A.F., Pocatello, Idaho.

FOR SALE—1933 custom built Hammarlund Comet Pro 11-tube superhet, tunes 15 to 550 meters, B.F.O. crystal, \$50; Also Philco model 18, 8 tube, 2-band shadow tuning, floor model; Philco dynamotor, input 6.3V DC, 2.7 amps.; output 150V 40 MA. Louis Reinhardt, 59 Mill Creek Drive, Youngstown, O.

FOR SALE—New Simpson #125 0-100 ma., \$35 ea.; Ditto #127 0-50 ma., \$35 ea.; Ditto #27 0-50 ma. \$6.35; Two national R154 R-F chokes, \$2.25 ea.; used Cardwell MT-35-GS, \$3.60; used Astatic Xtal mike D104, \$14.75; used Cardwell XP-90-KD, \$4.50; new Elmac 150PS, \$25 ea.; Ditto 100T, \$13.50; DeForest #11, \$10; RCA 955, \$3; used RCA 204A, \$35; used RCA 845, \$10; Philco #90 speaker, \$3.50, also various transformers. Fred Craven, 2216 So. 7th St., Philadelphia 48, Pa.

WANTED FOR CASH—Multimeter in good condition, Philco dynamic tester, and a vacuum tube voltmeter. Hugh E. McCauley, 1084 Hurd Rd., Clio, Mich.

WANTED—Rider's Manuals 1 & 2, also 4 to 12 inclusive. Robert O. Haseltine, Black Earth, Wis.

WANTED—Good tube checker, sig. generator, set tester, condenser & resistance tester, V-O-M, meters, tubes, parts, etc. for quick cash purchase. Orlis Q. Stotts, 1010 E. 'L' St. 20, Wilmington, Calif.

FOR SALE OR TRADE—Several brand new Philco di-pole FM antennas compl. with outdoor window-sill or wall mts, brackets & 50' transmission line. Sealed in factory cartons. Philco #45-2926. List \$8.25, will sell for \$4 ea. or trade for tubes. A. Brindley, 2821 W. Girard Ave., Philadelphia 30, Pa.

WANTED—0 to 5 volts ac meter, 12, 35, and 50 volt tubes, also an ac audio oscillator. A. B. Eatherly, 1504 Bernard Ave., Nashville 4, Tenn.

WANTED—A good multimeter and oscilloscope. Harold B. Fetterly, 179 Y 40, 320 S.W. Court St., Pendleton, Ore.

FOR SALE—Large amount of tubes, some 150 milliamperes type, battery charger; vac. cleaner with all attachments; etc. Sam Kaye, 9407 Avenue A, Brooklyn, N. Y.

FOR SALE—Most all types of radio tubes, many hard to get. Also most all capacities in by-pass condensers. Also Precision up-to-date counter model tube tester, and Supreme #91 radio analyzer. J. Choznak, c/o Schwarz, 614 Third Ave., New York, N. Y.

WANTED FOR CASH—Hickok 202 multimeter; also Triplett 1632 sig. generator. Willard Hall, 323 N. Monroe St., Peoria 3, Ill.

FOR SALE—Weston #506, 7V DC; Ditto 5V DC; Simpson 25 M.A. (2½"); Rol; ler-Smith Type TD, 0-6V DC - 0-120V DC; Zenith Dummy meter 75 M.A.; Readrite 2" 0-20 M.A. 0-100 M.A.; Westinghouse 2" sq. 0-5V D.C., 0-150V D.C. Chubb's Radio Service, 2771 Nostrand Ave., Brooklyn, N. Y.

WANTED—Rider's manuals, especially nos. 10, 11, 12, and 13. Edw. E. Fredrickson, 504 Grand Ave., Lead, S. Dak.

FOR SALE—Rider channely compl. with probes, phones and matching transformer, in perfect condition, \$100; Stromberg-Carlson 24-watt portable PA system. Racoon 4½" reflex trumpet with master PM unit (25-watt), both brand new, 30% from list on regular L-265 certification, 40% on AA-3 or better. Two used aluminum baffles compl. for 12" speakers, \$6 ea. or \$10 pr. Turner. Lifetime. Amperite microphones available. John H. Grey, Jr., P.O. Box 46, Bridgewater, Conn.

TO SWAP OR SELL—Test instrument, tubes, supplies. Write for list. John Troutbridge, 7936 Larnell, Chicago 20, Ill.

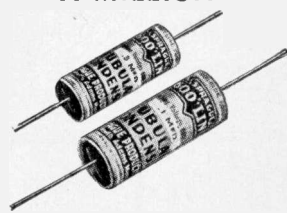
FOR SALE—Signal generator. Paul E. Troutman, Elizabethtown, Pa.

FOR SALE—Supreme 89 de luxe tube checker; Triplett 1200A V-O-M; Jackson 630 dynamic tube tester; Weston 770 tube tester with extra transformer for hi-filament tubes; 35-watt amplifier (Thordarson) with speakers & carbon mike complete; also transformers and other s-w parts. Chas. Ackenback, 136 E. Main St., Amsterdam, N. Y.

FOR SALE—Weston 692 oscillator, good as new, compl. with chart, coils, case & lead, but no batteries, \$25, or will trade on RCA channely. Carl J. Baker, P.O. Box 255, McRoberts, Ky.

FOR SALE—New 14-watt amplifier with tubes, radio input, also phono and mike inputs, \$25; new multimeter, \$38.50; AC-DC 6-tube table radio with new tubes, \$30. Want used N.R.I. radio course and all parts kits, also late

"NOT A FAILURE IN A MILLION"



SPRAGUE "TC" TUBULARS

When there's a by-pass capacitor job to do, do it with famous Sprague TC Tubulars—and forget it. They will not let you down!

We'll appreciate it if you ask for them by name.

model tube tester for all tubes. C. Morgan, 2209 Edison Ave., Jacksonville 4, Fla.

WANTED—All-wave sig. generator and tube checker combined or singly. Portable type for battery operation. George Lane, Clarondon, Ark.

FOR SALE—100' Amphenol co-axial copper tube cable with end connectors; various mil chokes; transformers; Weston; Jewell; Triplett DC milliammeters; used tubes, high voltage filter condensers, variable condensers, cabinets, etc., etc. Write for list. Harold J. Griffin, 1312 N. 35th St., Omaha, Nebr.

FOR SALE—1000 used tubes; two 6V DC converters; 4 battery sets with tubes; phono motors; projectors; small radios; magnetic pickups; 10 Webster amplifiers with speakers; midget & combination radios; juke boxes; AC motors; refrigerators, etc., etc. Write for list. Meyers Radio Service, 59 So. Erie S.W., Massillon, Ohio.

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 or print—hold it to 40 words or less. Due to the large number received, ads may be delayed a month or two, but will be published as rapidly as possible. 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. Remember that "Equipment for Sale" ads bring best results.

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

Dept. RSD-45, SPRAGUE PRODUCTS CO., North Adams, Mass.



SPRAGUE CONDENSERS KOHM RESISTORS

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

JUST THE THING
FOR SPRING

SYLVANIA SERVICEMAN SERVICE

by
FRANK FAX



Below is a compelling die-cut, full-color window display piece ready for spring business promotion. It catches the eye of men and women alike — a lovely girl at her spring housecleaning. Measures 34 by 17¾ inches — a convenient size for window or inside store use.

AVAILABLE ONLY AT YOUR LOCAL SYLVANIA DISTRIBUTOR. **FREE!**

Listen
WHILE
YOU
WORK

KEEP YOUR RADIO WORKING—TOO
REPLACE WORN TUBES WITH

SYLVANIA RADIO TUBES

BUY DEFENSE BONDS AND STAMPS NOW

SYLVANIA

ELECTRIC PRODUCTS INC.

RADIO DIVISION • EMPORIUM, PA.



Odds 'n Ends by KAK

Benny Goodman has disbanded his ork. . . . Jess Stacy has gone with Horace Heidt. . . . Stan Kenton is recovering from an emergency appendectomy in Florida. The saw-bones did it while he was on tour. . . . By the time you read this Ozzie Nelson will be in the Army. . . . Capt. Glenn Miller has a terrific film deal waiting for him when he gets out. . . . Artie Shaw is looking better and will do some recording. He has no band plans in mind at this writing. . . . Bob Crosby will be "told." He's about to become a Marine. . . . Eddie Miller, ace saxman, is in the Army at Ft. MacArthur. . . . Nappy LaMare may take over his band and library, all as reported here two months ago.

Sammy Kaye is 1A. (I'm a poet and don't know it!) . . . The Voice goes Paramount soon. . . . Ben Pollock has moved to larger offices. His was Bob Crosby's old band. . . . Wingy Manone is doing theatre dates and getting a divorce. . . . Ditto Matty Malneck, except no theatre dates. . . . T. and J. Dorsey may soon be at Metro, but on different pix. . . . Navy got Dennis (Yes, please) Day. . . . Russ Morgan opens at the coast. . . . Bee Wain vacationed there. She records for RCA-Victor.

Ella Mae Morse is busy making pix. . . . Martha Tilton opens at Capitol Recording soon. . . . Dick Haymes had sponsor trouble. He will not permit a gal singer on the show and was therefore dropped. . . . Dick Powell is free-lancing. . . . New album to be released soon by and of Johnny Mercer. . . . Alvino Rey has busted apart his ork. . . . Bill Early is subbing for Bob Zurke, who died the other month. . . . Laurits Melchior will pix it at Metro.

Spike Jones flew to Las Vegas to spike wife's divorce. No dice. . . . Jimmie Lunceford opens at Plantation Club in L. A. soon. . . . Gil Rodin and Ray Baduc, both formerly of Bob Crosby's Bob Cats, are reported overseas, but unconfirmed. . . . "Jackson" Teagarden will probably form small jamband, abandoning his big ork. . . . Dimitri Shostakovitch & frau will Hollywood it immediately after Schickelgruber's defeat. . . . As who won't. . . . Matty Matlock is Army bound.

Zutty Singleton is recording for Capitol with small combos. . . . Perry Como, the poor man's Bing Crosby, is in Hollywood to make pix. . . . That with The Voice makes about three of a kind. . . . And won't the bobby-six tribe get their kicks? . . . Rise Stevens starts pix soon. . . . Oscar Moore returned to civilian life after being in Army a short time. Reason: medical discharge.

Harriet Hillard is in pix called, "Hi, Good Lookin'," which is what she is. . . . Jan Garber and Liz Tilton are at the Palladium.

Charlie Spivak has organized a search for the "guy who plays the sweetest bugle in the world." He ought to hear me with my spring cold. . . . Louise King (of the

King Sisters) will fly—literally—with hubby Alvino Rey to their home in Arizona. . . . Duke Ellington is in NYC. . . . The Ratzies (apologies to Walt Winchell) and the Japanzies use American Jive to "bait" their American propaganda. That gets tuned out. And as the late Will Rogers said, there is no sympathy for the man "too lazy to turn off a program."

Shep Fields has transportation trouble. So have we. . . . Dave Rose (Holiday for Strings) is sergeant in Army. . . . Allan Jones is on CBS. What, not NBC? . . . Grace Moore is ace story teller. Not liar! She tells swell stories. Witness her autobiography, "You're Only Human Once!"

Some tickets for the Arturo Toscanini NBC Symphony Concert were priced at \$25,000. They sold well. . . . 'Twas in War Bonds, though. . . . Leopold Stokowski goes to Mexico this spring for a series of concerts.

That's about it for this month. BCNU.

RECORD REVIEWS

RCA-Victor

Gretchaninoff: Glory to Thee O Lord (Twofold Litany) (In Russian)

Tchesnokoff: Save Thy People O God (Record No. 11-8514)

General Platoff Don Cossack Chorus, Nicholas Kostrukoff, Conductor. N. Khadarick and A. Zakhartchenko, Baritones

The Russians use no instrumental accompaniment in their church services, but employ the difficult and marvelously effective medium of the a Capella choir. The vast range and intricate inflections of the men's voices make their vocal music most unusual and artful. The General Platoff Don Cossack Chorus, under the direction of Nicholas Kostrukoff, has recorded on this Victor record two religious selections of interest and merit.

Enesco: Roumanian Rhapsody No. 1 (Arranged for Two Pianos by Whittemore and Lowe) (Record No. 11-8515)

Arthur Whittemore and Jack Lowe, Duo pianists

Georges Enesco, the Roumanian composer and violinist has introduced some of his own music in this country as guest conductor of such organizations as the New York Philharmonic. The most popular example of his work is the Roumanian Rhapsody No. 1, which Arthur Whittemore and Jack Lowe, brilliant young pianists, have transcribed for their pianos on a single Victor Red Seal disc.

Bach: Triple Fugue in E Flat Major (St. Anne) (Record No. 11-8528) (Edited by Charles-Marie Widor and Albert Schweitzer)

Joseph Bonnet, Organist, playing the Hammond Organ, Gloucester, Mass.

Johann Sebastian Bach published a collection of his works in 1739, in a book called Klavierübung (klavier practice). In the third section of the book was included the Prelude and Fugue in E Flat Major. It is this Triple Fugue that Joseph Bonnet, celebrated French organist who excells in the interpretation of Bach and Cesar Franck, plays on this Victor Red Seal record.

NEW LETTER CONTEST for SERVICEMEN!

ELEVEN 1st PRIZE WINNERS IN 5 MONTHS IN CONTEST No. 1!

Yes sir, guys, the hundreds of letters received were so swell that *double* first prize winners had to be awarded each of the first four months and there were *triple* first prize winners the fifth and last month...

SO—HERE WE GO AGAIN!

Get in on this NEW letter contest—write and tell us your *first hand* experiences with all types of Radio Communications equipment built by Hallicrafters including the famous SCR-299!



RULES FOR THE CONTEST

Hallicrafters will give \$100.00 for the best letter received during each of the five months of April, May, June, July and August. (Deadline: Received by midnight, the last day of each month.)... For every serious letter received Hallicrafters will send \$1.00 so even if you do not win a big prize your time will not be in vain. ... Your letter will become the property of Hallicrafters and they will have the right to reproduce it in a Hallicrafters advertisement. Write as many letters as you wish. V-mail letters will do. ... Military regulations prohibit the publication of winners' names and photos at present ... monthly winners will be notified immediately upon judging.



BUY A WAR BOND TODAY!

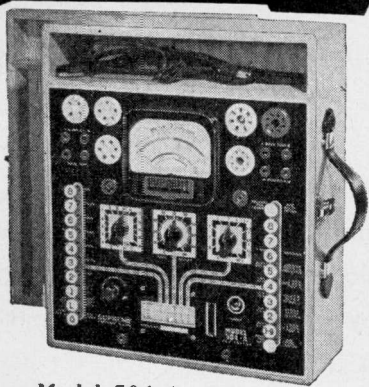
hallicrafters RADIO

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

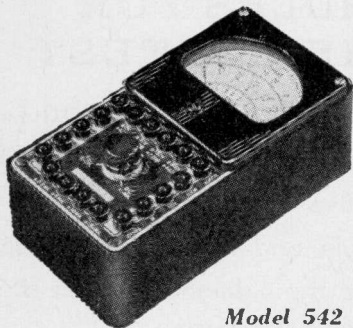
SUPREME

BY COMPARISON

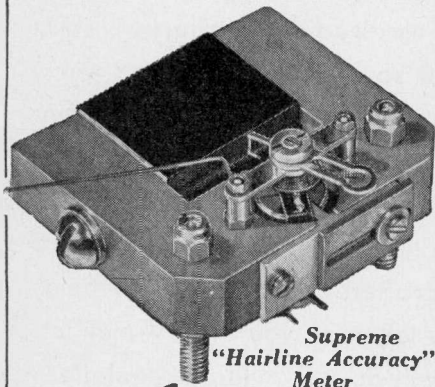
★ *Current Supreme Models*



Model 504-A
Tube and Set Tester



Model 542
Pocket Multimeter



Whats New-

IN TEST EQUIPMENT?

Military secrecy precludes our answering that now. But radical new developments in testing techniques have been and are being perfected. Because of these important advances, when Victory comes your NEW Supreme Test Equipment will be, more than ever, "Supreme By Comparison."

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

Letters to the Editor

HE VIEWS WITH ALARM!

Editor:

I read with some disgust McMurdo Silver's suggestion in the February issue of RSD, that surplus military electronic equipment be destroyed after the war, lest it flood the market and ruin the radio industry.

Let's assume that Mr. Silver has a few irons in the fire, and makes radio equipment which he wants to sell. He probably pays an advertising agency to create public interest and the desire to obtain his wares. It seems obvious that the release to the public of large quantities of miscellaneous radio parts at extremely low prices would be the greatest bonanza of free advertising and interest-promotion the radio industry ever had. Consider the thousands of newcomers to the radio field created by war-time necessity. If, after the war, you make available to them, at give-away prices, some of the equipment they have learned to use, you will create an army of experimenters, hams, etc., without impairing their purchasing power; and the amount of gadgets and equipment a radio bug will buy is limited only by his interest and his purchasing power, *not* by what he already has. Usually the more apparatus he has, the more he wants, as knowledge and ideas expand.

I feel sure most technical men in the service would strongly resent post-war (radio equipment) destruction.

Mark Woodworth, USNR
Virginia

Well, Mr. Silver? . . .

CHICAGO PLEASE NOTE

Editor:

No, Mr. Sacks, "Fifty Thousand Dollars isn't hay in any man's language." But—we enjoyed Mr. Sacks' story about his shop and think his ideas are very good, especially his minimum charge of two dollars. We don't want to question any of his statements, but one thing we don't understand is how one outside man can make twenty-five deliveries and pickups a day, especially in Chicago. And for the benefit of the uninitiated we would like to point out a few little items Mr. Sacks left unsaid on the debit side of the ledger. First, rent for quarters on the fourth floor of any downtown office building in Chicago comes high; at least \$200 or \$300 a month. You can't buy even a small home anywhere near downtown Chicago. At best you would have to live twenty or thirty miles from your work. Rent for a six room apartment in North or South Side Chicago would cost you another \$150 a month; of course heat is furnished and while you don't need it in Summer you pay for it just the same. Then there is the transportation problem; you can't use your automobile even if you wanted to, you can't park it in the Loop for less than fifty cents a day, so you ride the old elevated (or maybe the subway now) you leave home while it's dark, and you get

back the same way. If you ride the surface lines the people wear all the buttons off your clothes. The only green grass you ever see in Chicago is in the parks, and the nearest park to where you live is at least five miles away. A clean shirt lasts you till noon, and in winter the sun shines only on Tuesday. No, boys, life in Chicago isn't all it's cracked up to be; you can live in an apartment for ten years, and never know the people across the hall, you are always on the go, and a dollar is worth only about twenty-five cents here.

Another thing we were pondering about is the absence of any name on the sign above the showcase; whose shop is it? And why was it necessary to carefully delete the street numbers from the shop tag? Could it be this is Wabash & Jackson Blvd., or Lyon & Healy, for instance?

L. H. Harlow
California.

No, it was not Lyon & Healy! That is close, but not correct. The reason for deleting the name on the card was to permit each serviceman to use the ticket if he chose, by arrangement with the author, and another service of this magazine.

SUGGESTS ORGANIZATION

Editor:

Your article entitled *With the editor* pertaining to recent statements on releases by W.P.B. we found very interesting and bearing out facts which had caused us to come to the same conclusion already.

However, it is the writer's opinion that such statements are made to the trade who read them and readily agree on the contents thereof and say, "Yea that is absolutely correct" and let it go at that. It seems to me that steps should be taken within the trade for an organized effort that would bring our cumulative power to bear for correction of such practices.

Such a movement would require not only the cooperation of the small service dealer but the publications and parts manufacturers as well would have to play a big part in a properly organized movement in the industry; a voice that could be heard and made itself felt so that we would have better conditions brought about not only in this matter, but in all other regulations concerning us.

The sad part of such public information as WPB releasing four and one-half million replacement tubes, and then not have it materialize, is a reflection on the service dealer as withholding something from the public. Because retail buyers say to themselves that "He gets the tubes but he just saves them for his best customers" or "He sells them where he can get a large profit." The statement that you cannot get these tubes is not born out by the publicity which they are reading.

Let's fish around for the roots from which a really powerful organization could be built.

C. L. Fairchild,
Illinois.

While such an organization might have considerable merit, we do not believe that it could be formed because of the almost insurmountable differences of interests and wideness of the gap between the parts manufacturer and the dealer. It is a good idea, though.

(Continued on page 24)

FM-TELE NEWS

*Short items in the FM, television and allied fields
which should be of interest to the serviceman-dealer*

RCA Announces Plans to Make FM Apparatus in Postwar

The Radio Corporation of America plans to manufacture and sell FM home receiving sets of high quality design as soon as civilian production is resumed, it was revealed by Dr. C. B. Jolliffe, Chief Engineer of the company's RCA Victor Division.

In the first public announcement of the company's postwar plans on FM equipment delivered, Dr. Jolliffe also declared that RCA plans to manufacture a complete line of FM transmitters incorporating novel circuits developed through research before the war, but which RCA had not yet had an opportunity to incorporate into apparatus manufactured then.

"In the postwar period," he stated, "all RCA standard broadcast audio equipment will meet the present standards of fidelity for FM and consequently all standard equipment will be satisfactory for use with FM transmitters."

Advocates No Telly Change

Any change in television channels to higher frequencies would delay the commercial development of television broadcasting to a serious extent in the opinion of Paul Raibourn, president of Television Productions, Inc., the organization operating television station W6XYZ in Hollywood, Cal.

Discussing this matter in an interview today, Raibourn said:

"Three television stations in New York are ready technically to render an excellent service within the present standards. If standards remain established at present or lower frequency levels for a time sufficiently long to allow television engineers to overcome certain objectionable qualities inherent even in the present frequencies, the day of good reception and programs may soon be here.

"During the present war, scientists have uncovered a wealth of information about higher frequencies. This has led many to the belief that all television problems can be solved at these high frequencies since many broad channels would be available. However, the work in connection with the war has been almost exclusively confined to point to point transmission and reflection. The problems in television broadcasting where signals must go out in all directions and be satisfactorily received at all reasonable distances, are quite different.

"These problems, which are likely to be encountered in an aggravated form at higher frequency levels, are indicated in the results of a recently completed and extensive measurement survey of reception conditions from present television and frequency modulation stations in the New York area made by the Allen B. Du Mont Labora-

tories. In general, the survey indicates that reception is excellent but that multipath signals constitute the industry's number one reception problem. These multipath signals become rapidly worse as frequencies become higher.

"Du Mont engineers discovered a number of locations where interference of tall buildings, bridges and hilly terrain with the broadcast television signal caused the reception of two or more images from the same transmitter. These, registering in the receiver micro-seconds apart, create multiple images and diffused pictures. These troubles exist even in the lower channels which were taken away from television in June 1941 and given to F.M.

"Secondary images were found to be more prevalent within a radius of approximately eight miles of the transmitters due to the existence in that area of skyscrapers and other elevated structures.

"It is interesting to note that where multipath conditions exist, the quality of F.M. sound suffers accordingly. In such cases, it was difficult to find any one location for the receiving antenna where good sound quality was available from all different F.M. stations. The basic reasons for F.M. viz; unusual sound quality, are thereby considerably diminished. Such distortion will, of course, prove more serious on higher frequencies and shorter wave lengths.

"A rather complicated receiving antenna has been found effective in overcoming most of these difficulties at present F.M. and television frequencies.

"Although the survey was concerned only with black and white images, it is assumed that the situation will become even more serious with the coming of color television as in addition to image distortion, multiple images will produce off color images at the receiver," Raibourn added in conclusion.

Philco Bullish on P-W Telly Possibilities

With thousands of engineers, technicians, mechanics, carpenters, and other skilled laborers required to build television stations and several times that number of people needed to manufacture receivers, there is every reason to believe that television in the post-war period will be a bigger industry than radio ever was, it was predicted by David B. Smith, director of research for Philco Corporation.

"In the post-war television set, the picture will be larger than most of those available today, and some receivers may provide a picture as large as the average road map," Mr. Smith said. "You will probably have the television set in your living room, and you'll turn the lights down, but not out, when you look at it. In New

York, Philadelphia, and other Atlantic seaboard cities, you may very well have your choice of several programs within a few years. You'll see sporting events and scenes from Washington, perhaps the President making a fireside chat or sessions of Congress, or variety shows and drama from New York. New kinds of entertainment may be created as a result of television just as the movies changed vaudeville and the theatre."

Rapid expansion of television as soon as the war is over will depend upon the creation of networks linking stations together, so that the best entertainment and news programs can be made available to the viewing audience, Mr. Smith pointed out.

Electronics Applications Seen As Vital Postwar Sales Factor

The dramatic advantages offered by electronics in manufacturing and merchandising fields will be of vital importance in meeting highly competitive postwar economic conditions, David J. Finn, of RCA, declared at the monthly dinner meeting of the Philadelphia Sales Managers Association at the Bellevue-Stratford Hotel.

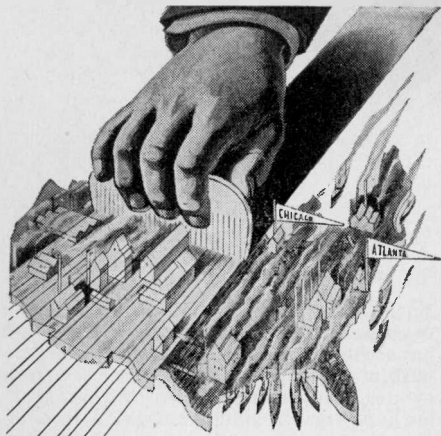
Both as a major factor in product quality and cost, and as the basis for a variety of extremely effective merchandising aids, he said, the science of electronics offers much with which successful sales executives cannot afford to be unacquainted.

Mr. Finn, who is sales manager of the Industrial and Sound Department of the RCA Victor Division, in Camden, N. J., reviewed the significant experience of several organizations now using electronic sound systems in sales promotion programs, and outlined probable postwar merchandising uses of wired television, facsimile, and wire record-

Television displays and demonstrations may be presented in stores, salesrooms, and show windows without the use of broadcast equipment and frequency channels, he explained, by conducting the signals over wires from the point of production. Such programs may be presented simultaneously in various departments.

Salesmen's reports may be electronically recorded on fine wire by merely dictating into the recording instrument, he said. Mailed to district headquarters or home office, the wire would be run through an electronic reproducing device and transcribed. Mr. Finn also predicted an expanded use of 16-millimeter sound motion picture film for training sales personnel and acquainting salesmen with structural and functional features of new products in their line.

BUY MORE BONDS



WITH A FINE COMB

Ever vigilant, Lafayette Radio Corporation's tracers fine-comb the field for radio and electronic components and equipment. We deal only with top-flight manufacturers, so quality and performance are assured. And the accent throughout is on Service. Whenever possible, same-day deliveries are maintained. If technical and priority problems perplex you—we've got 25 years of experience behind us to help pull you through. Call, write, wire, or teletype—either to Chicago or Atlanta. Orders, in any quantities, filled from both cities. Note: we build equipment to specifications.

Write or wire Dept. K-5 for our new 8 page circular listing merchandise available for immediate delivery. All of this material is subject to prior sale.

If you live in or near one of the 35 blood bank center cities, call the Red Cross today for an appointment your blood is needed.

Lafayette Radio Corp.

901 W. Jackson Blvd. 265 Peachtree Street
CHICAGO 7, ILLINOIS ATLANTA 3, GEORGIA

LETTERS

(Continued from page 22)

MORE ON BLACK MARKETS

Editor:

Reporting on "Black Markets" here want to say that the Jobbers here have tried all the tricks in the deck, from packaged tubes, (a lot you don't need nor want) to unloading a lot of defective, old stock condensers and outmoded and special transformers, at special prices, in order to get you to buy something besides tubes.

One small jobber went so far as to put up a sign that read, "Due to the shortage of tubes, we will sell one tube only, with each five dollar purchase of other apparatus or material," and said jobber claimed that the O.P.A. had OK'ed that and had instructed them to sell all the tubes that way they could. We understand that the sign has been removed now, but needless to say, we only go to this place when we can't find what we want elsewhere.

Then there's another jobber that has a brother who operates a retail store up on Main Street, and all the critical tubes and other material is diverted from this jobber to this retail store where it is sold at retail or better. We dealers won't forget this and other jobbers after the war. The writer was even told by one large jobber that the reason that the writer couldn't get any tubes there, was that he didn't have the right *shaped nose*.

Now of course we dealers know something of the jobber's problems during these times, especially these jobbers of sets as well as parts. These fellows have built up great organizations of dealers in sets, and these set dealers have stuck with them through the years, and of course it is only natural that the jobbers should take care of these fellows first. But to cater entirely to that class leaving the independent service man out on the limb is neither wise or fair. After all, they should realize that the small independent service dealer is the one that the set owner depends on to keep his set in operation, especially after the free service period is over. If they make it too hard for the service dealers to get parts, tubes, etc., they are going to get a lot of knocks about the sets they are pushing.

Some of the jobbers here have been very fair and have pro-rated tubes and other items to us, on a fair basis and if they have tubes we can get them,—that is, our share,—and these are the jobbers that we will continue to support after the war. We service dealers have to take some of these bitter pills, but we don't have to like them.

There is another small jobber here that none of us have been able to understand, and we can't figure his racket. Every service dealer that we know of has come away from his place with the same experience. He won't sell a dealer anything that has metal in it, and talks so much about priorities, that we have dubbed him "Priority Pete." He says he sells large orders to the Army and Navy, but balks at selling a serviceman anything he can help. Now we learned the other day, that this same jobber sold three 117Z6 tubes at slightly "high" lists to a fellow here that does not claim to be a service man, and only fools around home, has a defense job somewhere and buys up old sets and repairs them and sells them, hasn't a sales place, nor even a retail sales permit.

Now we ask you, "Is that black mar-

ket?" None of the service dealers that the writer knows of have been able even to find any of these tubes for months, and here is a fellow, disguised as a wholesaler, digs them up for a man not even in the radio business. We are reporting this deal to O.P.A.

The whole thing sifts down to this, if we spend all our money with one jobber, we can get whatever tubes this jobber gets,—that is, our share,—if he doesn't get any, neither do we and therefore we are sunk. If we spread our money around where it is most advantageous to ourself, then we are told that we don't spend enough money with any one jobber to rate any tubes, so we are still sunk. So what?

We can't imagine what the fellows up in the sticks do that have to depend on mail orders for their supplies. We saw one postal card from one of these fellows, listing over 400 tubes this man wanted and the jobber had just ten he could supply.

The order L-265 has done no good, in fact a jobber showed me an order cancelling all the tubes he had ordered over a three month period on L-265 over 5000 tubes.

We hope this new set up of giving all service dealers, etc., a rating of AA-3 and allowing them to order what they need, the jobber not being able to divert these. This should help, at least it should cut out a lot of this black market stuff and unauthorized retail sales.

L. H. Harlow,
California

WANTS HIS DAY!

Editor:

I am in the music (as well as the radio) end (of the business).

With tubes that are hard to get, records that are also on the same list, the question that gets me is, "Is this guy Hitler or Goebels running the small businessmen out?"

The method used (by the wholesalers) is sending you any-and-everything that can't be used! For instance, records that you couldn't sell to an eskimo, (or) tubes that were used in the good old battery days! When you do get some (tube) it will probably be for one set; and then you wait for another 30 days and sure enough you get a batch of dogs that the almighty only knows where you can use them! That's the reason that I think if the small dealer and serviceman would get unionized or organized, these distributors would not use this method of "Take it, or else . . .!"

. . . Now to top it off, (the wholesaler) advises the dealer and serviceman to send their sets to *him* for repair. What, for instance, does a dealer do?

So when this War is over . . . do we forget and their bossy salesman comes in with his hand out. . . . Boy, what a spot you can put that baby in. . . . Sure would be a laugh!

(I am) hoping and praying that we will have (our) day!

A. Friedlund
Michigan

We know how you feel, Mr. Friedlund, and undoubtedly there has been some skull-duggery and "fancy work" by some of the wholesalers, but the great majority have not had it easy either, and have had to take whatever the manufacturer handed out to them,

too. They are looking forward to their day, also. We believe that when the War is over, all will get together in good old American fashion, and after having it out between them, will shake hands and get along with the tremendous business of Post-war!

NO APPLIANCE PARTS SHORTAGE

Editor:

We have just received your February issue containing your editorial on *WPB* publicity releases and heartily agree with you. Our postage and stationery expense is enormous, caused by our endeavor to educate our dealers in the "facts of life." But each new announcement of a *WPB* authorization still brings a deluge of orders from optimistic dealers still hoping that an authorization means manufacture.

However, we wish to take issue with you on some of your comments on the survey releases. We are *Hotpoint* distributors and have no knowledge of a single *Hotpoint* appliance in our territory now inoperative due to the owner's inability to obtain parts. We are shipping parts orders within 48 hours approximately 98% complete and the only long delay is in porcelain parts which are not available and must be repaired and re-enameled.

The situation is not so rosy in the radio field, where inventories on parts are very low and we are unable to obtain parts and tubes from our sources of supply, but we receive almost daily bulletins offering tubes in large quantities at retail prices from various mail order establishments.

Undoubtedly, large quantities of any electric appliance could be sold, but how much of such demand is due to acute need and how much due to increased consumer buying power and desire for something new is open to question.

E. S. Dozier
Tennessee

<<<< >>>>

New Low-Price Square Wave Generator

The newly organized Relner Electronics Company of New York City announced the development and production of a new low-priced Square Wave Generator Model 530, designed for production testing. It incorporates a feature not found in other square wave generators, the facility of synchronization with any external frequency source.

Model 530 Square Wave Generator has a hand-calibrated frequency scale reading from below 10 cycles to more than 100 kilocycles. The Decade Multiplier has four steps. The actual frequency of the output is the dial reading multiplied by the setting of the frequency multiplier. The accuracy of the frequency calibration is 5% over extended periods.

In cases where great accuracy of frequency is desired, the instrument can be made to synchronize with any standard frequency generator, provided that a synchronizing voltage of at least 0.1 volt is available. The synchronization can also be made with any other external frequency source.

The output impedances available are 100 - 200 - 500 - 600 - 1,000 - 2,000 ohms. Output voltage may be varied either in fixed steps or may be continuously varied by means of the variable volt-

age potentiometer. When the latter is used, the output impedance is from 0-2,000 ohms.

If the output voltage is varied in steps, the output impedance is indicated by the output voltage selector setting. The maximum voltage output is approximately 200 volts.

<<<< >>>>

Emerson Publishes History of Small Radio

"Small Radio, Yesterday and In The World of Tomorrow," titles an impressive book on that subject and on the vast strides of electronic development during the past two years, which is now being issued by the Emerson Radio and Phonograph Corporation.

In the several chapters of the at-

tractively bound volume, Benjamin Abrams, president of Emerson, traces the evolution of small radio from the early midget designs of 1928 up to the last compact models which were produced in 1941.

"The story of small radio," writes Abrams, "is the story all over again of the unwanted child who grew up to pay off the family mortgage." Using his own experience as a vehicle for the history, he reveals how a small clock case turned his thinking toward miniature models and how his company was stampeded as a result, is but one of many passages.

While dwelling at some length on the wonders of electronics, Abrams makes a strong plea for realism in the projection of postwar products. He counsels engineers and manufacturers

"THE HELP SITUATION" by Larlar



HERE'S HELP THAT MAKES LIFE EASIER FOR YOU

It's possible to improve the working conditions of your employees and at the same time make life easier for yourself.

It's a lot easier for the man at the bench to get factual and authoritative circuit data from one of the thirteen Rider Manuals than it is for him to laboriously trace the circuit of an ailing receiver and guess-out the servicing information he needs to repair it. It's a lot more pleasant for him—and you too. For your production is increased—and deliveries speeded.

Never have Rider Manuals been so widely used as today when speed in the tracing of circuits means not only additional profits, but the development and preservation of invaluable good will. Have all thirteen volumes of Rider Manual on each of your benches. Check the list to the right—order any missing volumes today.

Check, too, the list of Rider Books. They're chock-full of technical information that can further speed your repair work and enable you to make the most of your present opportunities to add to the volume and good will of your business.

RIDER MANUALS (13 VOLUMES)

Volumes XIII to VII \$11.00 each volume

Volumes VI to III 8.25 each volume

Abridged Manuals I to V [1 volume] ... \$12.50

Automatic Record Changers and Recorders 6.00

OTHER RIDER BOOKS YOU NEED

The Cathode Ray Tube at Work
Accepted authority on subject \$3.00

Frequency Modulation
Gives principles of FM radio 1.50

Servicing by Signal Tracing
Basic Method of radio servicing 3.00

The Meter at Work
An elementary text on meters 1.50

The Oscillator at Work
How to use, test and repair 2.00

Vacuum Tube Voltmeters
Both theory and practice 2.00

Automatic Frequency Control Systems
—also automatic tuning systems 1.25

A-C Calculation Charts
Two to five times as fast as slide rule 7.50

Hour-A-Day-with-Rider Series—
On "Alternating Currents in Radio Receivers"—
On "Resonance & Alignment"—
On "Automatic Volume Control"—
On "D-C Voltage Distribution" 90c each

JOHN F. RIDER PUBLISHER, INC.
404 Fourth Avenue, New York 16, N. Y.
Export Division: Rocke-International Corporation
13 E. 40th Street, New York City Cable: ARLAB

RIDER MANUALS

GIVE YOU THE HELP YOU NEED!



against unrealizable offerings of dream sets immediately after the war. "Such a policy," he warns, "has within it the element of disappointment which could easily lead to consumer buying paralysis—immeasurably retard the re-employment which will be so vital to our security and prosperity in a war torn world. Certainly there have been almost miraculous electronic developments," Abrams states, "but it may take from one to three or four years to bring most of them into practical home set production and operation. Television is perhaps the only new electronic-radio development for home use which can be produced within six months after the war ends."

FILLING OUT WPB-617 FORM

(Continued from page 12)

later, the plant owner can, if the Tax Law remains what it is today, elect to depreciate the balance left, at once. It is well to remember, however, that the WPB and the Tax Department are both aware of the fact that little depreciation other than in replaceable parts occurs in a Sound System, and that should be taken into consideration when applying for Tax Amortization. Nevertheless, at this writing, it has been indicated that a maximum amount of 35% may be allowed in depreciation taken over a 5-year period, or the duration, whichever is shorter.

Having decided that this depreciation

rate is of interest, the form should be filled out as follows:

Turning to page 1 of the form, insert the name and address of the applicant. The applicant must be the owner or operator of the war plant; and a complete set of forms must be filled out for every plant location. Where a group of buildings on a large or adjacent plots comprises the plant, one application will suffice; where there are more than one group of buildings or building over a large area, say a town or city, then a separate set must be submitted for each group or building.

Under 1 insert the products manufactured. Use general terms. Where the unit is confidential, write, for instance, "Radar equipment—confidential," or "Ordnance—confidential," or "Ships—confidential."

Almost anything that goes into the War Effort either directly, like guns, ammunition, radio—or indirectly like candy, blankets, cloth, food or the like may be allowed as a "War Product." It is not necessary that it be sold directly to the Government; but if it is not sold directly, and is not a sub-contract for another Government contractor, write after the product, "See Remarks Column for Explanation."

Under 2 A list all the prime contracts held by the war plant if it does any of this work. The contract numbers should be furnished, and the product (except if confidential—then write, "Confidential")—and the department for which it has been produced. This last can be "Army," "Navy" "Coast Guard," etc. or "FBI" "CAC" or whatever the department is in general terms. The face value in dollars of the

contract should be entered in column (d). If there are more than can be entered in the page, use a separate writing sheet laid out the same, and make entries until all or most of the contracts are listed. These should be as of a certain date, most conveniently the close of business at the last quarter, or any other period elected by the plant owner.

Under 2 B enter the sub-contracts with the pertinent information as far as that is known. Where the "End-use" is unknown to the plant owner, write, "Unknown." Be sure to give the name of the prime contractor or to whom the products are furnished even if that be, itself, a sub-contractor.

Write, "Not applicable" across 3.

Under 4 write the "End-use" breakdown of the products manufactured by percentages if it is known. If unknown, write as much as possible, lumping the unknown under "Others-unknown" in the last space left blank in the form under 4.

Under 5 A, write: "None available" if the installation is a new one, and "Old Installation worn out" or "Installation not satisfactory" as the facts may be.

Under 5 B, write "None Available" if the installation is new; or write "Installation not satisfactory" if that be the case.

Under 5C and 5D write, "Not applicable" in each section.

Under 6 place the date when the jobber expects to complete installation. A suitable answer in view of the uncertainty in date of the return of the WPB-617 form might be, "30 (or 60 or 90, etc.) days after permission granted by WPB."

Under 7 A, B & C write, "Not Applicable." Under sections 8, 9 and 10 write, "Not Applicable."

Under 11 A write, "Sound System is needed to produce music at fatigue periods, for morale-lifting, and for (selective) paging. The System will act to reduce absenteeism, improve production efficiency and output. It is a recognized asset to employee working conditions."

Under 11 B write, "Not Applicable."

Under 12A-1 write, "Not Applicable."

Under 12A-2 have the plant owner give full information as to number of employees, work hours per week, etc. He may pick the quarter for which he gives the figure, but that quarter must be identified in the upper line.

Under 13 give the correct answer by putting an "x" in the proper square. If the answer is "yes," give brief details. One sentence will be sufficient. The notation to be made under 14 is the same as for 13, and if the answer is "yes," the statement should be brief and limited to one sentence.

Under 15 write, "Not Applicable."

If a previous application for a sound system has been made, list it under 16, giving the department to which the application was made, and other pertinent information. If no previous application has been made, write, "No previous application for Sound System has been made to any Government or WPB across the face of section 16.

Have the plant owner designate the persons with whom the WPB or Tax

(Continued on page 28)

CINAUDAGRAPH SPEAKERS Do a WORLD WIDE Communication JOB!



If you aren't getting delivery as quickly as you like—remember, the armed forces come first.
Watch Cinaudagraph Speakers after Victory!

Cinaudagraph Speakers, Inc.

3911 S. Michigan Ave., Chicago



"No Finer Speaker Made in all the World"

Subscribe Today!

radio service dealer

- FIRST... in paid circulation to owners of leading service-dealer establishments**
- FIRST... in total coverage amongst leading radio & appliance service-dealers**
- FIRST... in volume of replacement parts advertising for service-dealers**
- FIRST... in number of pages of text published on repairing radios & appliances**
- FIRST... in publishing exclusive articles geared to the needs of service-dealers**
- FIRST... has the highest subscription renewal percentage in the industry**

A Limited Number of New Subscription Orders Can Still Be Accepted. Use the Order Form Below. Tear It Out... Mail It Today! Extend Your Old Sub. With It.

**TEAR
OUT**



RADIO SERVICE DEALER

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

COWAN PUBLISHING CORP.
342 Madison Ave., New York 17, N. Y.

Sirs: Here is my check (or money order) for \$.....Enter my subscription order for the next.....issues. The information given below is accurate. If my subscription is rejected I expect an immediate refund in full. Subscription Price: 12 issues \$2.—24 issues \$3. Canadian and Foreign subscription are \$3 annually.

Name (print carefully)

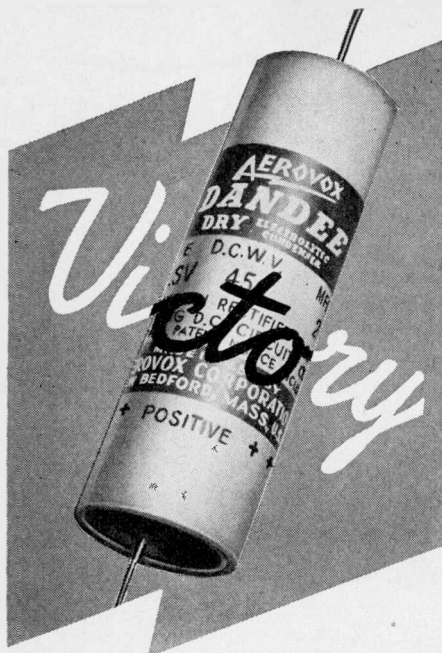
Address City State

Firm Name Year Est. 19.....

I am OWNER If some other classification or occupation, state it on the line below:
 DEP'T MGR.
 EMPLOYEE

Please check whether firm is

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



ELECTROLYTICS

● In keeping with wartime restrictions on materials, manpower and production facilities, Aerovox Victory Dandees are making the most of the situation by offering you a lot of electrolytic capacitor life at a small cost.

Available in nine "Victory" values which, individually or in combinations, meet all capacitance and voltage requirements for some 90% of usual electrolytic capacitor replacements in radio sets.

● See Our Jobber . . .

Ask him about Aerovox Victory electrolytics and also paper tubulars. Be sure you have a stock on hand to take care of rush jobs. Ask for catalog—or write us direct.



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

Department may communicate, giving their title within the organization and their addresses.

Place the corporate seal where marked in form and type in name of corporation on line left therefore. Have responsible official of firm sign on line indicated by the word "By" and place his title under it on the suitable line. The signature must be attested to by the corporation secretary. If the plant owner is a non-incorporated company, place the name of the company on the line, "Name of Applicant" and have the owner sign on the line marked, "By" placing the word "Proprietor" in the line marked, "Title." If the business is in the name of an individual, place his name in typewriting on the line marked, "Name of Applicant" and have him sign on the line marked "by." Nothing is then put in the line marked "Title."

The certification, required under Section 35 (A) of the U. S. Criminal Code, is executed in much the same manner as the signature to the application except that the corporate seal (in the case of type firm) and the signature of the secretary is left off. Be sure to insert the date of the application.

Turning now to "Appendix A" page 1 (readily identified by the number, GPO-War Board 9301-p.1 appearing in the lower right-hand corner), write "Not Applicable" across the face of this side *horizontally*. Turn the page over.

On page 2 on this form, under the heading "MACHINE TOOLS" enter the following information:

The "Name of Manufacturer" is the name of the manufacturer of the Sound System. If built by a jobber, and of no name brand, enter "Composite." Under "Size," enter power output. A proper answer would be "25-watts," or "50-watts," etc. Under "Type" write, "Public Address System" or "Sound System." Under "Cost (Dollars)" enter the cost of the equipment without the cost of installation. Under "Kind" write, "Sound"; under "Model No." write the manufacturer's model number, if any. If there is no model number, write, "None." Enter any special features under that heading. Such might be, "Selective Paging," or "Radio tuner" etc. Give the number required by the customer under "Quantity." This completes this form.

On "Summary Sheet—Appendix A," marked "GPO-War Board 9302G-p.1" in the lower right-hand corner, enter the plant location in the space provided under "Location of Facilities." Give the name of the company and its address in the space provided. Under "Equipment" enter the cost of the Sound System taken from the previous sheet and put the cost in dollars in the column (c), "ESTIMATED (dollars)." Put the estimated cost of the hook-up wire in the column marked, "OTHER." Add the two together and place total in proper column.

Under "REMARKS," write a full explanation of why the Sound System is needed. Generalize, and explain about the lessening of employee's fatigue, the raising of morale, the necessity of cutting down absenteeism, the use for paging and hence the saving of time, the increase of production efficiency because of better employee relationships, etc., etc. If the plant is a war plant by indirection—that is, its products get

into war effort indirectly—this is where a suitable explanation should be written. Such an explanation, in the case for instance, of a candy factory might be:

"The products of this plant, which are 5c candy bars, are sold directly to jobbers. But a careful check on the sale of these jobbers reveals that 80% of their stock is sold directly to canteens in Army Camps and Ships' Service in Navy Centers. It is therefore believed that 80% or better of the end products of this plant eventually get into the War Effort by direct use by the Armed Services."

A vitamin plant might say:

"The vitamins of this plant are sold to civilians for the most part, even though quite a few are also sold directly to the Government. It is a recognized medical fact that vitamins are a necessity for the health of the community and hence for the war workers. It is represented that the product of this plant, namely vitamin pills, are therefore a direct asset to the Country's War Effort and Victory."

If there is not enough room under the heading for a full explanation, use an extra sheet or as many as are needed to execute a full and complete statement.

This completes form WPB-3467. One copy of each form should be accompanied by 2 copies each of the two "Appendix A" sheets per set.

««« »»»

PARTS STORE GOES TO WAR

(Continued from page 7)

bers, we plan to produce a new, and greatly enlarged catalog which will doubtlessly reflect the war's impetus on radio; and which will contain a larger variety of parts together with full description of each item. With the increased knowledge in the radio art so widely disseminated through the war and the communications systems of our own Armed Forces as well as those of our United Nations, it will be imperative that such descriptions accompany each item.

Nothing less will satisfy the new radio men!

««« »»»

A-M CHALLENGES F-M

(Continued from page 14)

station the same as your telephone. It has been in use for many years on pleasure boats in their ship-to-shore radio. It can be added to "plural modulation," and presto—you have home radio telephone with more available stations than you now have phones!

What about the present receivers. With FM, a converter is needed to utilize the radio sets we now have. With "plural modulation" that would also be true. But what we would not need with "plural modulation," would be the special ultra high frequency antennae which make the reception of FM possible. Our regular receiving antennae will do, and sets without antennae—using the loops in the back—will also work with

FADA'S
S.M. 81
SERVICE
MANUAL

AN
INDISPENSABLE
AID TO THE
SERVICE MAN

Here's the
Book You've
Been Waiting
for!
Contains all
available Service
Data on all
FADA Receivers
\$ 1.00
Plus
Postage
Send for it Now!

FADA OF NEW YORK
928 BROADWAY NEW YORK, N. Y.
Large Stock of Replacement Parts & Cabinets

“plural modulation.” There is the great advantage!

The “ham” or licensed radio amateur has been wondering if he will be able to get back his frequencies after the war. With “plural modulation,” it would be possible to assign one single frequency in each of the five “ham” bands and put every ham now on holding a license, or ever to hold a license, regardless of how many there might be, on each of the single frequencies and still have large holes through which one could “run” without ever hitting a signal!

There would be room for police, doctors, ships, telephone, broadcasts, airplanes, intercoms, maintenance and what not, and still the spectrum would be open—wide open.

We have been hearing much on FM and television of late! The “Boys” are hot on either one.

We bet that the AM men have something up their sleeves!

Could it be “Plural Modulation”?

««« »»»

WITH THE EDITOR

(Continued from page 2)

shortage, it will not be possible to produce the two million electric irons for civilians as originally planned. Instead, WPB will try to find some way of having two hundred thousand new irons made during 1944.

At the time war began, service-dealers, distributors and manufacturers had on hand what could be called a normal inventory of replacement parts and tubes. Because the electrical appliance industry had enjoyed greater experience, and possibly a more substantial financial background, it, like the automotive field, was blessed with a greater inventory of replacement parts than was the radio field. But since the inception of priorities, no replacement parts production worth mentioning has been achieved. Stocks of radio and electrical appliance repair parts have been used up. Shelves are bare. The bottom of the barrel has been reached, and it is time for clear heads to take cognizance of the situation and then set about doing something to alleviate the chaotic situation. (The tube situation has been more than chaotic for many months).

A few hundred pounds of metal, a few hundred man-hours and a few automatic machines allocated for producing a few dozen primary type of replacement radio

tubes would clean up the entire messy tube shortage, wipe out the rampant black market, and put hundreds of thousands of war-workers’ radios back into use. In like manner, a few dozen pounds of filament heater wire for irons, a few thousand thermostats for irons . . . these would enable service-dealers to put thousands of idle irons back into use now, when they are badly needed. Give us a few motors and some refrigerant and we’ll keep electric ice boxes,

(er, pardon us)—refrigerators, a-working.

It is time that our production schedules for civilian commodities be objective and geared to the immediate present, not to the future. Let’s have replacement parts, radio tubes, gears and motors for refrigerators, etc., now so present commodities can be kept operative. It’s more logical for WPB to accomplish this rather than waste time trying to find a way to make new appliances



TODAY in WAR.. TOMORROW in PEACE

On mile-a-minute PT boats, as on hurtling jeeps, rumbling tanks, amphibian tractors and “walkie-talkies”, Brach Antennas are doing their part in the vital task of communications. Today, our entire output goes exclusively to the nation’s armed forces—on land, on sea, and in the air. But after the war, for the best in radio antennas and accessories, remember the name—BRACH.

L. S. BRACH MFG. CORP.

World's Oldest and Largest Manufacturers of Radio Antennas and Accessories
55-65 DICKERSON STREET • NEWARK N. J.

CLAROSTAT

ROLLING ON TO



★ Clarostat continues to be engaged 100% in the most important job of all—winning the war—on land, sea and in the air.

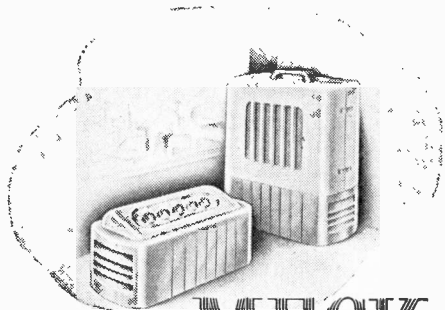
But after victory has been won, Clarostat promises the trade—servicemen, jobbers and others—that Clarostat products for initial and replacement uses alike, will once more be generally available for peacetime pursuits. Meanwhile, let's keep 'em rolling!



CLAROSTAT

Controls and Resistors

CLAROSTAT MFG. CO., Inc., 285 7 N. 6th St., Brocklyn, N. Y.



MECK

Sound Equipment

Neat?—Far more than that! For Meck Sound will give you a new concept of performance as smart as this unique new design. And you can prepare for a new viewpoint on sales opportunity, for sound will be Standard Equipment in business and that will mean big business for you.

JOHN MECK INDUSTRIES
PLYMOUTH, INDIANA

New York 18, Fifth Ave., Chickering 4-3545
Chicago 11, 540 N. Michigan Ave., Delaware 1561

which can not be made this year even though they are supposedly scheduled for production.

S. R. Lowan

««« »»»

MARCONI MEMORIAL SCHOLARSHIPS

Commemorating the 6th Anniversary of the death of the Father of Radio, Guglielmo Marconi, the Veteran Wireless Operators Association, an organization comprised of the pioneers of wireless, last month presented 3 Marconi Memorial Scholarships over Station WOR and the Mutual network. The tied winners: Frederic Corbin Leiner, St. Louis, Ill., and Francis Herbert Horne, an Army Signal Corps Inspector at American Jewels Corp., Attleboro, Mass.

The program was opened by the sending of the memorable International Morse letter "S" by Ted R. McElroy, who in addition to being the world's champion in the International Morse code and the American Morse, is one of the world's fastest operators in the Japanese Kata Kana code.

As a living memorial to the man who gave radio its first real impetus, the V.W.O.A has established Marconi Memorial Scholarships in radio and television engineering in leading schools throughout the country. Selection is by a contest conducted under the auspices of Science Service, an organization which sponsors science and engineering clubs in high schools in 42 states.

Messrs. Horne and Leiner will receive tuition-free scholarships at RCA Institutes, and a special award of a scholarship in television engineering at Midland Radio and Television Schools after the war. In the interim, Mr. Lothar Shnitkin, a graduate of the Brooklyn (N.Y.) Technical High School, will be given a scholarship in the home study division of the Midland School.

««« »»»

Baker Describes Better Working Conditions P-W

A prediction of better working and living conditions for business and industry with equal benefits to the American home, through the application of electronics, was made recently, by Dr. Walter R. G. Baker, Vice President in charge of the Electronics Department of the General Electric Company, in an address entitled, "The Importance of Electronics in the World Today and Tomorrow."

\$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.

While Dr. Baker emphasized that electronics would not perform the impossible in the interests of mankind in the future, he strongly urged the members of his audience to familiarize themselves with electronics and to cultivate the electron so as to be able to take advantage of its facilities when the war comes to a close.

He asserted that many of the wartime advances in electronics will have peacetime applications of major importance but would not elaborate upon them because of an extremely secret nature.

"In great sprawling factories busy on arms production, in cotton mill, printing plant, fruit-packing house, steel mill, railroad and knitting mill," said Dr. Baker, "the magic electronic tube is working miracles for American industry."

Declaring that only imagination now

INSIDE DOPE

Twenty pages of "hot" tube substitution tips that are not common knowledge are clearly and completely explained in the NEW RELEASE:

"SUPPLEMENT No. 2"

(Code: GREEN)
to the

"RADIO TUBE
SUBSTITUTION &
CHANGE-OVER MANUAL"

Price: 50 cents

SUCCESSFUL FORERUNNERS . . .

"RADIO TUBE
SUBSTITUTION &
CHANGE-OVER
MANUAL"

(Code: BLACK)

Price: \$1

and

"SUPPLEMENT No. 1"

(Code: YELLOW)

Price: 50 cents

See your Radio Parts Jobber
or write

OELRICH PUBLICATIONS

1627 S. Keeler Ave.
Chicago 23, Ill.

A GOOD PLACE TO BUY YOUR

**RADIO
AND
ELECTRONIC
DEVICES**



BURSTEIN-APPLEBEE CO.

1012-14 McGee St. Kansas City, Mo.

Limits the use of the electronic tube in industry, Dr. Baker said, "the magic tube that levels elevators in skyscrapers, counts traffic, and controls the flow of power in electric furnaces, will double and triple its industrial deeds in the future. The money that the electronic tube will save, the burdens it will lift, the inventions it will stimulate, no man can foresee but the tiny electron, partner of business in a thousand ways, is also mobilized to gigantic tasks set by industry's power machinery."

Elaborating on the application of electronics, Dr. Baker said that "electronic devices control the high-speed wrapping of packages, fill ginger ale bottles to the proper level," and added that "in the food industries, too, electronics plays a big part. X-rays inspect candy to detect intrusive foreign materials, and check packaged goods for deficiencies in fill."

"X-ray examination of oranges saved California citrus packers \$7,000,000 in one record year. Similar fluoroscopic X-ray inspection checks golf balls, molded plastics, rubber heels and wire insulation. These are only a drop in the bucket of the many things accomplished by the miracle of the electron."

««« »»»

RCA VICTOR ISSUES MORSE CODE PHONO RECORDS

A modern, streamlined system of instruction in the International Morse code has been incorporated in a 6-record "album" which Victor released last month.

Prepared by John N. Cose, Director of Instruction at RCA Institutes, the album and accompanying booklet are designed to acquaint students with the actual sound of the Morse code letters as they would be sent over the air and to provide them with specially prepared practice transmissions which should develop the students' ability to copy regular code messages.

A novel feature of the Morse-code album is the incorporation of instructions on the records themselves, with the handbook as a check on all practice messages transmitted.

The first 8 lessons are devoted to alphabet instruction and special practice in letters introduced. Following intensive instructions and practice in the 26 letters, the album moves on to a study of coded 5-letter groups, longer plain English words, sentence structure, "hard to memorize" English transmission, and winds up with a practice session of 5-letter cipher groups using all the letters of the alphabet in unfamiliar combinations.

Vocal instruction disappears gradually throughout the album, leaving the last records almost completely devoted to code practice work. Two stumbling blocks in code instruction, memorization and anticipation of contents by the student, have been overcome by use of code and cipher groups which form unrecognizable words.

The war has created an unusual de-

KEN-RAD

ELECTRON TUBES

FOR EVERY WAR PURPOSE NOW...
For you when possible!

KEN-RAD
REGULATIVE OFFICES
OWENSBORO · KENTUCKY
EXPORTS 11 MOORE STREET NEW YORK

TRANSMITTING TUBES
CATHODE RAY TUBES
SPECIAL PURPOSE TUBES

RECEIVING TUBES
INCANDESCENT LAMPS
FLUORESCENT LAMPS

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

Standardize ON

STANCOR

Transformers

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

STANDARD TRANSFORMER CORPORATION
1500 N. HALSTED STREET · CHICAGO



CORPORATION

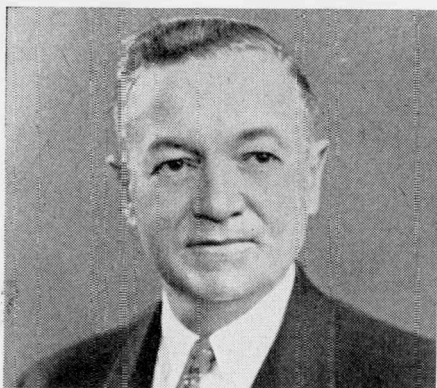
mand for code instruction, with the armed forces calling for trained signal men and the U. S. Signal Corps sponsoring training schools all over the country. The new Victor code album may be used as a valuable supplement to these code training courses.

««« »»»»

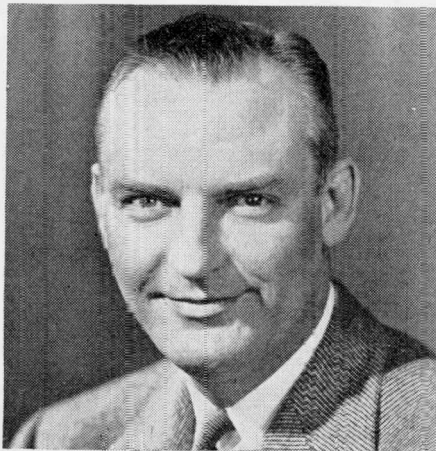
RECENT APPOINTMENTS



Lee D. Baker, recently appointed as Vice-President in Charge of Major Appliances of Admiral Corporation, Chgo.



Elected to Vice-President in Charge of Sales is Joseph K. Fabel of the Cardwell Mfg. Corp., Brooklyn, N.Y.



Leonard C. Truesdale, recently appointed Assistant Commercial Manager, Manufacturing Div. of The Crosley Corp.

STROBOSCOPIC PHONO CHECK

(On the front cover)

The front cover shows how a check can be made both of the speed of a phono motor and the frequency of AC portable power.

The disc has a paper label which is divided into two rows of dots. The larger dots are for 33 1/3 rpm, while the smaller "half-moons" are for 78 rpm. The discs operate on AC, 60-cycle power only; and can be obtained in all record stores for a few cents each.

To check speed of an AC phono motor, hookup neon bulb to known AC source, such as a house line, and start motor observing proper circle of dots depending on appropriate rpm speed. If speed is correct, dots will seem to stand still.

This check is valuable using portable power. A neon bulb operated on house current while motor is operated from portable power will immediately show if the speed is correct because the dots will not stand still.

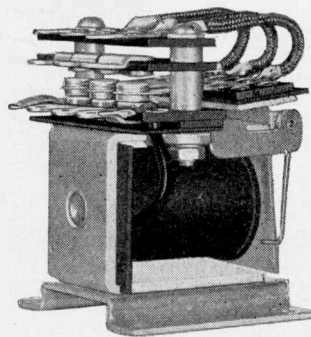
If the dots previously stood still using house current on both neon and motor, then the frequency of the portable power is off.

Off frequency operation makes for inordinate distortion, and is to be avoided. There is no way to correct for frequency shift in portable motors which is not expensive and burdensome.

««« »»»»

AIRCRAFT RADIO RELAY

A general purpose radio relay, the series 345, designed by Guardian for aircraft use, its available in contact combinations from single pole, single throw up to three pole double throw. This feature is available in contact combinations series 345 designed for use in aircraft, from single pole, single throw up to combined with the large coil winding area makes the series 345 a highly efficient relay in compact space. Dimensions are 2 3/8 x 2 1/32 x 1 11/16 in. Contacts, rated 12 amps. at 24 volts



DC., are arranged to resist over 10 G. acceleration and vibration in all positions.

Coil resistances range from .01 ohm to 15,000 ohms in a varnish impregnated and baked coil. Standard voltages are 16 to 32 however other values are available. For circular 345 with full details, write Guardian Electric, Dep't. 345, 1637 W. Walnut Street, Chicago, Illinois.

Ad Index

Aerovox Corporation	28
Agency: Austin Lescarboursa & Staff	
Brach Mfg. Co., L. S.	29
Agency: United Adv. Co.	
Burstein-Applebee Co.	32
Agency: Frank E. Whalen Co.	
Cinaudagraph Speakers, Inc. ...	26
Agency: Michael F. Mayger	
Clarostat Mfg. Co.	30
Agency: Austin Lescarboursa & Staff	
Fada of New York	28
Agency: Sternfield-Godley, Inc.	
Galvin Mfg. Corporation ... 3rd Cover	
Agency: Gourfain-Cobb, Inc.	
General Electric Co.	1
Agency: N. W. Ayer & Son, Inc.	
Hallcrafters Co., The	21
Agency: Burton Browne, Inc.	
International Resistance Co.	5
Agency: The Lavenson Bureau	
Ken-Rad Tube & Lamp Corp. ...	31
Agency: Allen, Heaton & McDonald, Inc.	
Lafayette Radio Corp.	24
Agency: Shappe-Wilkes, Inc.	
Mallory & Co., Inc., P. R. 2nd Cover	
Agency: The Aitkin-Kynett Co.	
Meck Industries, John	30
Agency: Western Advertising Agency	
Meissner Mfg. Co.	3
Agency: Gardner Advertising Co.	
Racon Electric Co.	17
Agency: Leon Allen, Advertising	
Radio Corporation of America ..	8
Agency: Kenyon & Eckhardt, Inc.	
Raytheon Production Corp., 4th Cover	
Agency: Burton Browne, Inc.	
Rider, John F.	25
Agency: Lansford F. King Advertising	
Sprague Products Co.	19
Agency: The Harry P. Bridge Co.	
Standard Transformer Corp.	31
Agency: Burnet-Kuhn Adv. Co.	
Supreme Instruments Corp.	22
Agency: O'Callaghan Adv. Agency, Inc.	
Sylvania Electric Products, Inc. ..	20
Agency: Arthur Kudner, Inc.	
Universal Microphone Co., Ltd. ..	15
Agency: Ralph L. Power, Advtg.	
Utah Radio Prods. Co.	13
Agency: The Buchen Co.	

REFRIGERATOR REPAIRS

(Continued from page 18)

tributed and will be of a uniform depth. With the reduced capacity due to the loading of the condenser with liquid there is a possibility of there being short cycles on the warmer temperature control settings with the possibility of stalling at each start. It is not likely that the unit will cycle on the colder settings of the control because of the reduced capacity. The pressure equalizing time will be long, much the same as the high side restriction, the reason again being that the restriction does not allow a normal flow of refrigerant through the tube requiring more time for pressure equalization.

The temperature conditions on the high side will be much the same as that for a high side restriction, the portion of the condenser that is full of liquid being quite cool and that portion that has hot vapor in it being extremely hot.

"Handie Talkie"

★ Pioneered and developed exclusively by Motorola Electronics Engineers, this mighty, little 2-Way Radio is fighting for Victory on every important battle front.

ANOTHER
Motorola
Radio
1st
★



For the continued development and production of Radio Communications and other special Electronic equipment for our Armed Forces, the Motorola organization has been awarded two stars for its Army-Navy "E" Flag. Motorola is proud of the part it has been privileged to play in the speeding of Victory.



Motorola

GALVIN

RADIO
FOR HOME & CAR

MFG. CORPORATION • CHICAGO, ILLINOIS



on the
threshold of a
new Era!


THIS is an "Electronics" war! Radio and electronics are writing a most vital chapter in the history of modern warfare. Many of the new developments in electronic tubes are military secrets, but in the postwar period the whole world will benefit by the tremendous strides in the engineering achievements and manufacturing methods born of military needs.

Yes, the foundation is being laid *today* for the glorious peacetime era of electronic achievement that will begin on that *tomorrow* when victory is assured. Then, as now, Raytheon will supply electronic tubes with the "Plus-Extra" performance qualities that have built the Raytheon reputation over the years.

When the Peace is won, Raytheon, due to its unique wartime experience, will be better qualified than ever before to supply manufacturers of postwar radios and of industrial electronic equipment with electronic tubes for the most exacting applications.

Raytheon Production Corporation

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



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

RAYTHEON

High Fidelity

RADIO & ELECTRONIC TUBES



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