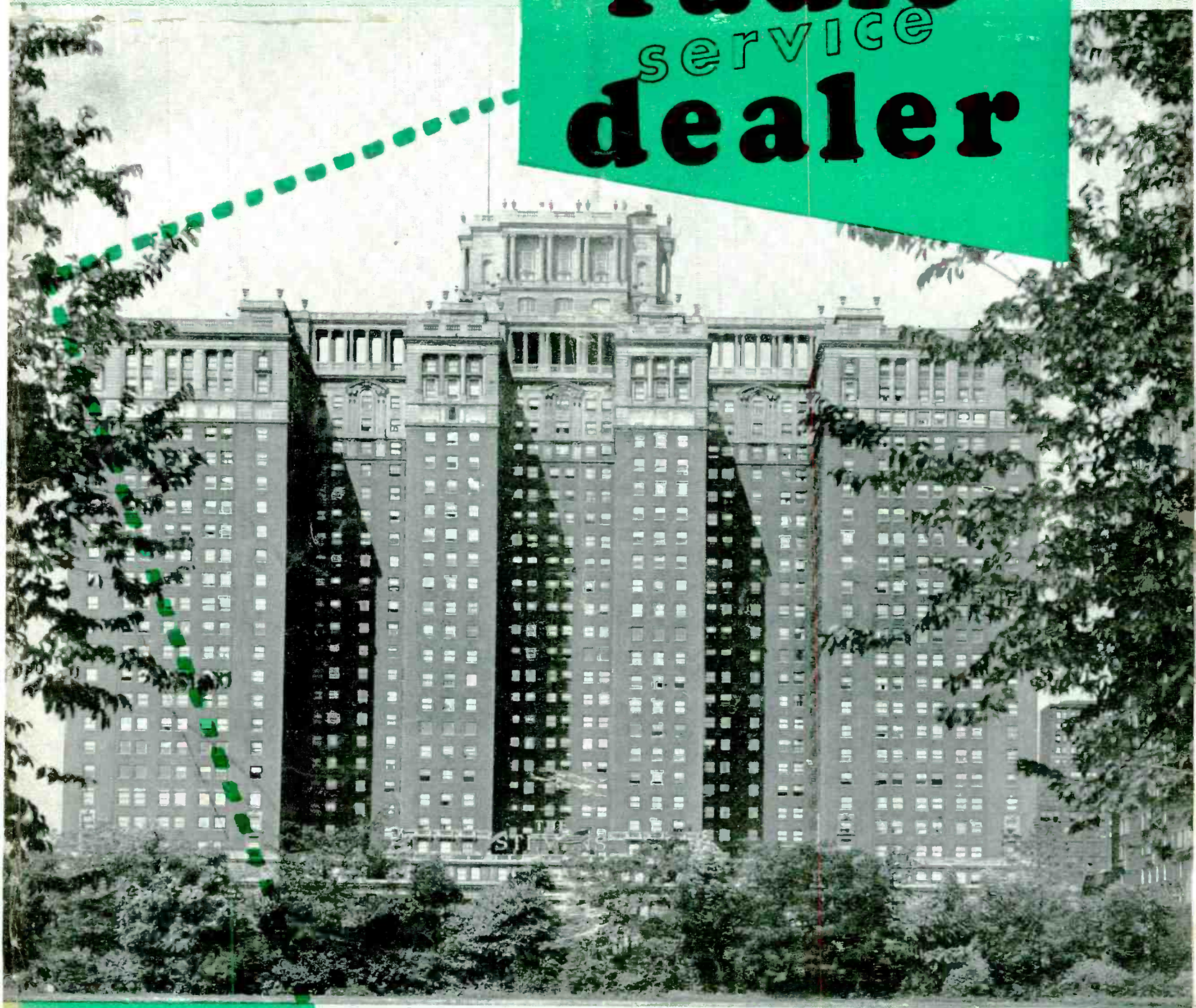
RADIO PARTS AND ELECTRONIC EQUIPMENT CONFERENCE AND SHOW

Preview Issue

(See pages 10 and 50)

radio service dealer



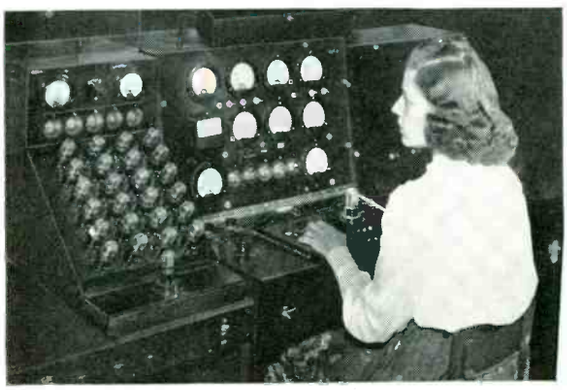
In This Issue:

APRIL

1946

MAKING TUBES IS EASY

If YOU KNOW HOW!



This standardized Hytron production tester is composed of three units: preheater, characteristics tester, noise tester. To permit a better view of the equipment, only one of three operators is shown.

HOW THE HYTRON 12SK7GT IS QUALITY CHECKED

Test	100% Production Test	Central Inspection Sampling	Quality Laboratory Sampling	100% Test at Packing
Shorts	x	x		x
Base shell connection	x	x		
Heater current	x	x	x	
Plate current	x	x	x	
Screen current	x	x	x	
Grid current	x	x	x	
Transconductance	x	x	x	
Suppressor action	x	x	x	
Emission	x	x	x	
Heater-cathode leakage	x	x	x	
R-f noise	x	x	x	
Transconductance cutoff	x	x	x	
Vibration			x	
Insulation resistance			x	
Input capacitance			x	
Output capacitance			x	
Grid-plate capacitance			x	
Grid emission			x	
Immersion (basing cement)			x	
Life			x	
Overall length			x	
Mechanical*	x		x	
	x	x	x	x

Mechanical tests are covered by a multipage specification. Typical inspection is conducted visually and/or by gages for the following: pin solder, etching, getter flash, diameter, base-bulb alignment, bent base pins, glass defects, and rigidity of internal elements, bases, and base pins.

AGAIN HYTRON'S LONG EXPERIENCE GIVES YOU THE BEST...

FOR your protection Hytron tubes are quadruple-checked. On the production floor, each tube is first tested for significant characteristics. In the central inspection department, a random sampling is next taken for statistical control of the production testing—to assure quality within acceptance limits. Failure at this point demands 100% retest.

Daily a smaller random sampling is subjected to a searching design check of characteristics such as inter-electrode capacitances, grid emission, and transconductance cutoff. These characteristics can be controlled by the smaller sampling, and their testing requires laboratory precision. Simultaneously production tests are again repeated for further statistical control. Again failure to meet acceptance limits demands 100% retest—even for design characteristics not production-tested.

Extreme accuracy and flexibility of this Hytron master test station particularly fit it for quality control.

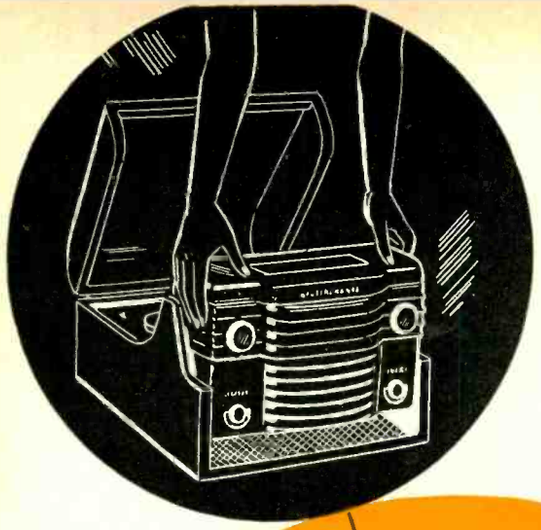
Finally each tube is once more short-tested and mechanically inspected just before packing.

This painstaking quadruple-checking ensures that specification failures of tubes actually shipped will be a practically irreducible minimum. When you buy a Hytron tube, you can be certain that every ounce of Hytron know-how on quality control—reinforced by wartime experience—has been in there punching to give you only the best.

OLDEST MANUFACTURER SPECIALIZING IN RADIO RECEIVING TUBES

HYTRON RADIO AND ELECTRONICS CORP.

MAIN OFFICE: SALEM, MASSACHUSETTS



The Revolutionary New WESTINGHOUSE DUO

It's a radio-phonograph with automatic record changer . . . but you can lift out the radio and play it anywhere. The hottest sales feature of 1946!

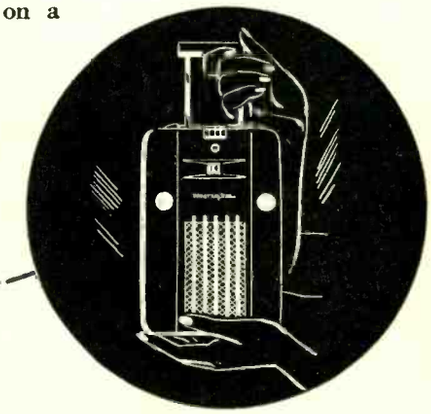
The Amazing PLENTI-POWER CIRCUIT

This exclusive feature gives a low-priced Westinghouse 7-tube set more undistorted output than most 12-tube sets had prewar. *Anyone* can hear the difference . . . *everybody* likes it. It means sales to the millions who want 12-tube performance on a 7-tube budget.

NEW IDEAS That sell radios

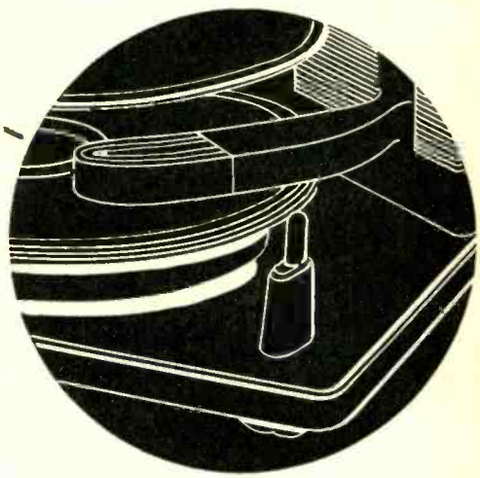
more proof that you can depend on WESTINGHOUSE RADIO for originality

For more information call your Westinghouse Distributor or write Home Radio Division, Westinghouse Electric Corporation, Sunbury, Pa.



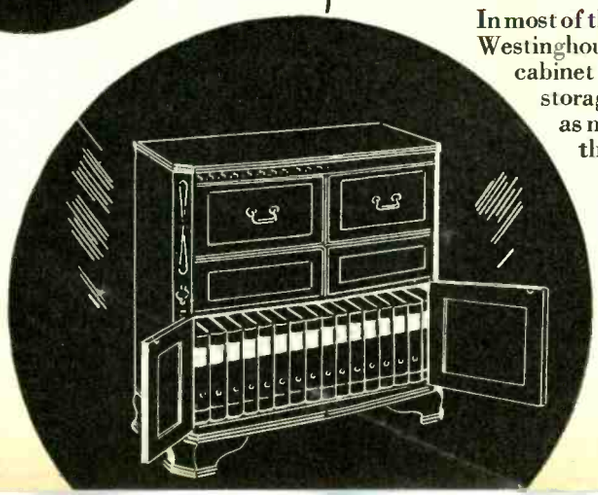
A POWER-HOUSE IN A JEWEL CASE!

Never before has such performance been packed into a set of this size. You'll have to hear it to believe it!



THE EAR-LEVEL SPEAKER

Something new you can demonstrate. The sound originates at the *most natural level* for listening enjoyment. No acoustical loss or distortion from the carpet or floor.



6 TO 10 TIMES AS MUCH RECORD STORAGE SPACE

In most of the new radio-phonographs, Westinghouse has made the entire cabinet width available for record storage space . . . 6 to 10 times as much as prewar cabinets of the same size . . . a real selling feature for people with record libraries.

A completely new AUTOMATIC RECORD CHANGER

Single-button control! No changeover levers to push! No complicated operating instructions.

When you want to operate the tone arm by hand, do so . . . no danger of throwing the automatic mechanism out of adjustment. After the last record is played the tone arm returns to rest and the turntable shuts off automatically.

RADIO'S FIRST NAME IS

Westinghouse

Radio **Television**

radio service dealer

Member Audit Bureau of Circulations

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

VOLUME 7 NUMBER 4

APRIL, 1946

CONTENTS

Cover: Stevens Hotel, Chicago. Scene of 1946 Radio Parts & Electronic Equipment Conference & Show, May 13-16.

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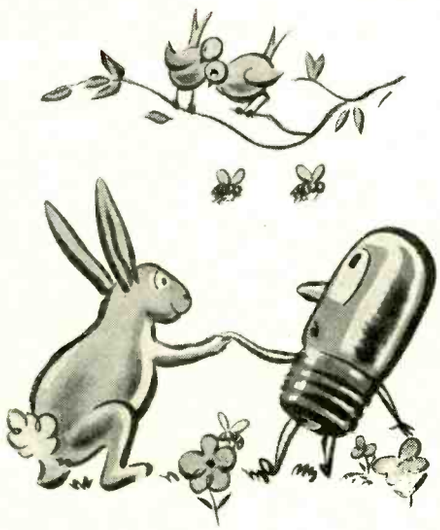
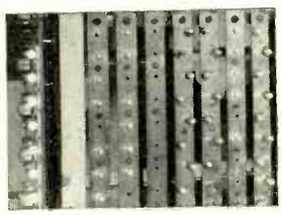
It tells the facts of Life!



Radio Dial Lights

Every year, the life-rack tests thousands of General Electric Lamps: lights them and burns them continuously until they go out. The lamp life, light output, and wattage consumed are all carefully checked. And that's just another step General Electric takes to produce the long life and efficiency you get in G-E Miniature Lamps.



Many other tests and inspections are used. Each makes sure the lamps you sell will give the best possible service at low cost. For radio dial lights and similar uses, consider these profit-points of G-E Miniature Lamps:

1. **Dependable, trouble-free performance.**
2. **High level of maintained light output.**
3. **Low current consumption.**
4. **Profitable to handle.**
5. **Greater dealer acceptance.**

FOR INFORMATION *on prices and types of G-E Miniature Lamps, see your nearby G-E Lamp Office. Or write to General Electric Company, Division 166, RSD-4, Nela Park, Cleveland 12, Ohio.*

G-E LAMPS

GENERAL ELECTRIC

We're coming in...

A static has made a lot of "pick-ups" along the line and here we are ... breezing through the azure blue ... headed for the Show ... and you. It's going to be fun ... shaking hands with the old gang again ... and the new-comers, too. We'll be holding forth at the Stevens, where you'll find Astatic Microphones, Phonograph Pickups and Cartridges ... including many new and improved models ... on display. We'll be seein' you!

Hotel Stevens
CHICAGO, ILL.
Headquarters for
Radio Parts National Trade Show
May 13, 14, 15 and 16

THE ASTATIC CORPORATION
CONNEAUT, OHIO
In Canada: Canadian Astatic, Ltd. . Toronto, Ont.

with the publisher.....

The Pressure Is On

BEFORE the war less than sixty firms were licensed to manufacture radio receivers. In addition, of course, there were about a score of semi-successful "loft" manufacturers. Of this total, less than fifteen firms were really important factors by virtue of their producing over 95% of the nation's total annual output of home and auto receivers.

Just after V-J Day over one hundred and forty firms held RCA and/or Hazeltine licenses to manufacture radio receivers while hundreds of opportunists were planning to jump into *sub rosa* production sans license. The latter hoped to make a quick clean-up and faster exit. For a while it looked as though there would be a battle royal, with tremendous set production and sale, with prosperity going to the successful survivors. Alas, there has been a rude awakening! Now we find that all manufacturers' planning has gone hay-wire.

Granted, manufacturers have accumulated astounding back-logs of unfilled orders. Production lines should be humming and dealers should be swamped with customers clamouring for sets. In actuality, what few receivers have been delivered to dealers are for display use only until a supply nearly sufficient to accommodate the demand has been accomplished. One or more factors—material shortages, unstabilized parts inventories, strikes, unsatisfactory OPA price schedules and others of like nature—have been contributing causes to the almost microscopic current production. While there is no appreciable labor shortage, the demand for increased wages constantly upsets both OPA's and manufacturers' attempts at pricing. Theorizing that "all phases of the industry should sacrifice some profit so the price line can be held", OPA has even cut, and cut again, the profit margins of dealers and distributors. Why such unjustified and reasonable discrimination against dealers and wholesalers has been chosen by OPA is beyond us. Perhaps the OPA thinks that this group has some Fairy Godmother who has protected them against increased overhead, higher wages, increased living costs, and the like. But then who in his right mind would attempt to understand lots of wacky things the OPA tries to foist on ordinary tax-payers, especially if they have no strong voice to represent their interests in Washington.

This is not intended to be a tirade against OPA. Instead, we want to factually report that within the past few weeks over a score of licensed radio manufacturing firms have cancelled their franchise and in sheer disgust with prevailing conditions have decided to get the hell out of the radio manufacturing picture. Of course, it is an acknowledged fact that some of them, and others who still are holding on might not have been able to survive the highly competitive period which lies ahead. Voluntary or involuntary abdication from the field should be decided by one's ability or lack of it . . . not by factors over which one has absolutely no control. The fact remains — Service Dealers are in a tough spot. They must protect themselves with a franchise for a line or two of receivers, and yet they have no way of knowing which manufacturers will ever be able to survive this Do Nothing period or the keenly competitive one ahead. One tried and proven adage might serve as a guide: "Stick To Advertised Brands". The chances are that a firm that has confidence enough in itself to invest in advertising for future sales must believe that it will be around when these sales can be consummated.

Happy Birthday To Us

THIS ISSUE of *RADIO SERVICE DEALER* takes us into the ripe old age of Seven years. That's young compared to some journals which have served their field for upwards of a hundred years; while the dean of all magazines, Saturday Evening Post, is a mere 218 years young. But "RSD" and its staff has had a hard row to hoe during most of its short career because the war caught us with a small paper quota and an especially hard obligation of catering to a field that got practically no consideration in the way of tools and parts with which to work. Better days are ahead for all of us. So, may we say a sincere "Thanks" to all you fifteen thousand top-notch Service Dealers who comprise our monthly audience. Next year we hope to have you with us still for another celebration.

Time-Payment Time Approaches

ONE of the greatest inventions of modern times is the Deferred Payment Plan. The system which allows honest people to buy necessities and luxuries by paying for them over extended periods has been a prime contributing factor in raising living standards while at the same time improving our national economy. Every Service Dealer, whether located in a large or small, rich or poor community, should be thoroughly familiar with all phases of time-payment selling and how such financing can be carried on either by themselves or through banking interests who specialize in this type of business cooperation. In future issues, we'll cover the subject thoroughly.

S. R. Lowan

Publisher

Attention—Cunningham Distributors!

SEE what RCA has at the Chicago Radio Parts Show!

STEVENS HOTEL—MAY 13-16

Make tracks for Display Room 10—3rd Floor... and witness Merchandising History in the Making

IT'S NEW . . . IT'S STARTLING . . . it's one of RCA's contributions to the advancement of electron tube and parts distribution. Distributors throughout the country will hail it as the answer to one of their tube and parts selling problems.

What is it? It's *store selling in modern form* . . . lifted to new peaks of efficiency through the design of special sales-servers *adaptable to any floor layout* . . . geared to accommodate *any business volume.*

You'll see the complete line of sales servers . . . hear how they can bring more business your way. You'll be shown model store layouts that will help you visualize just how this new store-selling technique can build your business. Bring your floor plan dimensions with you and let's discuss and lay out an effective store arrangement for you.

MEET THE GANG AT "RCA HEADQUARTERS"

(See Hotel Bulletin Board or RCA Booth for Room Number)

See the display in Room 10 by all means—but don't forget the gang at "RCA Headquarters" want to see you, too.

Drop around anytime for a bit of friendly conversation—and refreshments. But make it a date for sure.

Listen to "THE RCA SHOW," Sundays, 4:30 PM, EST, NBC Network

A QUALITY PRODUCT FOR RADIO SERVICE-DEALERS BY THE RADIO CORPORATION OF AMERICA

A value range equal to its frequency range . . .

. . . A LABORATORY-TYPE SIGNAL GENERATOR FOR SERVICEMEN

We've been designing and producing signal generators for a good many years—each one the best we were able to produce in that year. They have always been pace-setters. Over the years they have become the standard of utility in such instruments for servicemen—distinguished always by that inbuilt Simpson accuracy that stays accurate. Every new model has stepped up the value, dollar for dollar, of the serviceman's investment.

Now this Model 415, with the widest frequency range of them all, tremendously widens the value range as well. Every dollar of its price buys more than a dollar ever bought before, even in a Simpson instrument. We know, for instance, of several signal generators built for laboratories only, selling *at twice and three times the price* of the Model 415, that will do very little more than this new Simpson Wide Range Signal Generator for AM and FM. And no serviceman's instrument we know of even approaches Model 415 in range, control, constancy of output, completeness of attenuation and degree of utility. Here is another of Simpson's 1946 developments in instruments for radio and television servicemen, the product of long and rewarding research.

We offer Model 415 in the proud knowledge that it is not likely to see its peer for a long time to come.

1. Direct reading dial with continuous coverage from 70 Kilocycles to 130 Megacycles in the following ranges: 75-200; 200-600; 600-1750 Kilocycles and 1.5-4.5; 4-15; 14-30; 29-65; 58-130 Megacycles.
2. Model 415 is practically independent of line voltage fluctuation. Calibration is stable regardless of wide variations in line voltage.
3. RF output is controlled through its entire range, eliminating the necessity of a separate connection for high uncontrolled output as found in other signal generators.
4. RF output voltage is practically constant throughout the entire frequency range.
5. Modulation from 0 to 100% using either the 400 cycle internal sine wave or an external source. A range from 0 to over 20 volts of 400 cycle sine wave is available for external use.
6. High fidelity modulation up to 100% from below 60 cycles per second to over 10 Kilocycles per second.
7. No unwanted frequency modulation present.
8. Each Signal Generator is individually calibrated against a crystal controlled frequency standard.
9. Substantial construction assures maintenance of calibration accuracy indefinitely.

PANEL—Lustrous black anodized aluminum. Dial is encased in a molded bakelite escutcheon with glass covering for protection against damage and dirt. Functional switches and controls are mounted on engraved molded bakelite panels.

CASE—Steel, copper plated for shielding effect and finished in black durable wrinkled enamel. Leather carrying handle.

SHIELDING—In addition to the overall shielding offered by the case and panel, the coils and tuning condenser are individually shielded, then an additional shield is placed over these two assemblies. This series of shields together with other factors reduce leakage to an absolute minimum.

COILS—Low loss RF coils are individually calibrated by means of variable inductance and variable minimum capacitance. These adjustments provide the means for greatest possible accuracy in calibration.

BAND SELECTOR—The rotating turret coil assembly permits the use of shortest possible wiring, resulting in minimum circuit capacitance and permits quick selection of any frequency range.

CONDENSER—A two section tuning condenser using either one section or the other provides for ideal inductance to capacity ratio on all bands. Smooth vernier tuning permits accurate adjustment of the selected frequency.

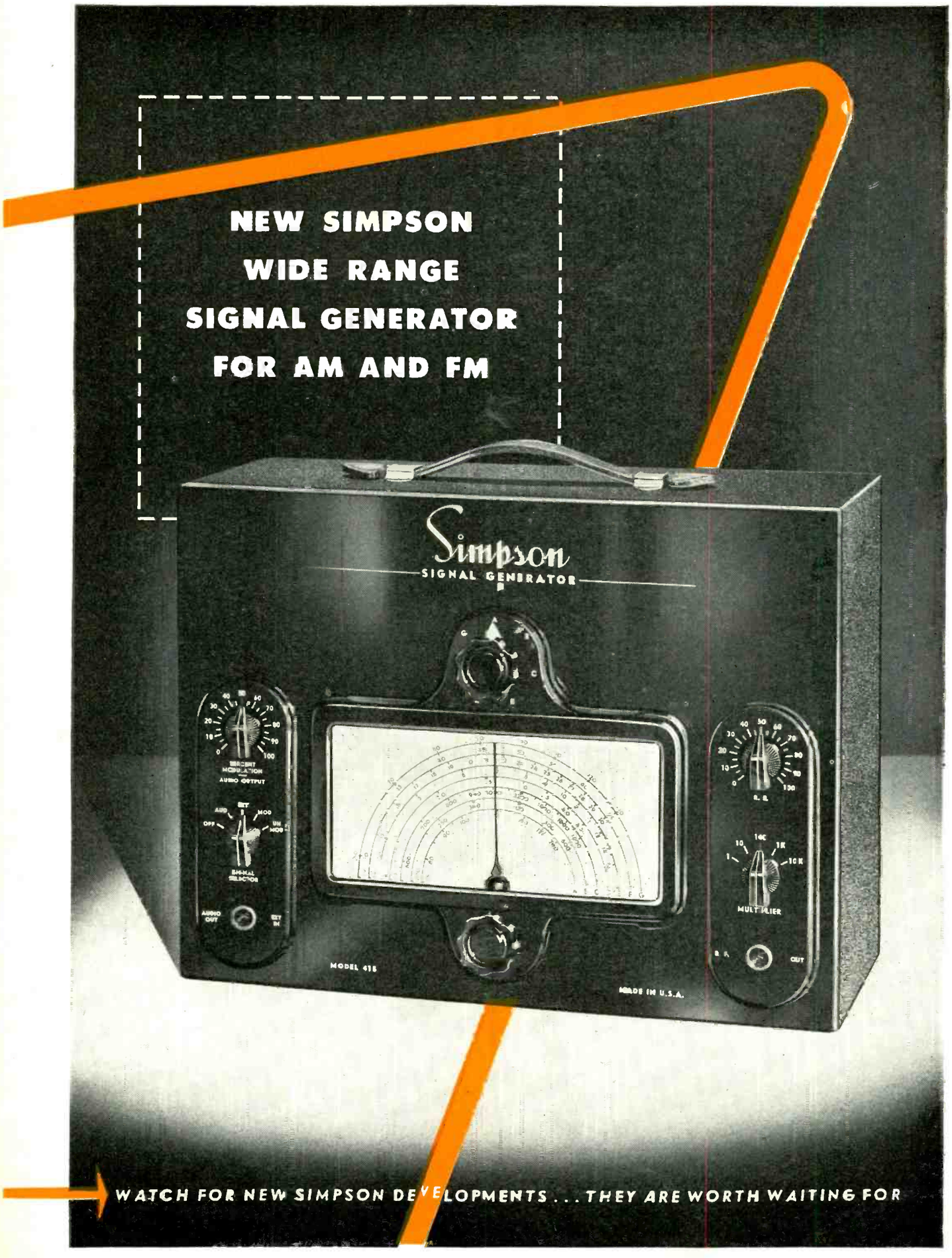
Price $115.00

ASK YOUR JOBBER

SIMPSON ELECTRIC COMPANY
5200-5218 W. Kinzie St., Chicago 44, Illinois

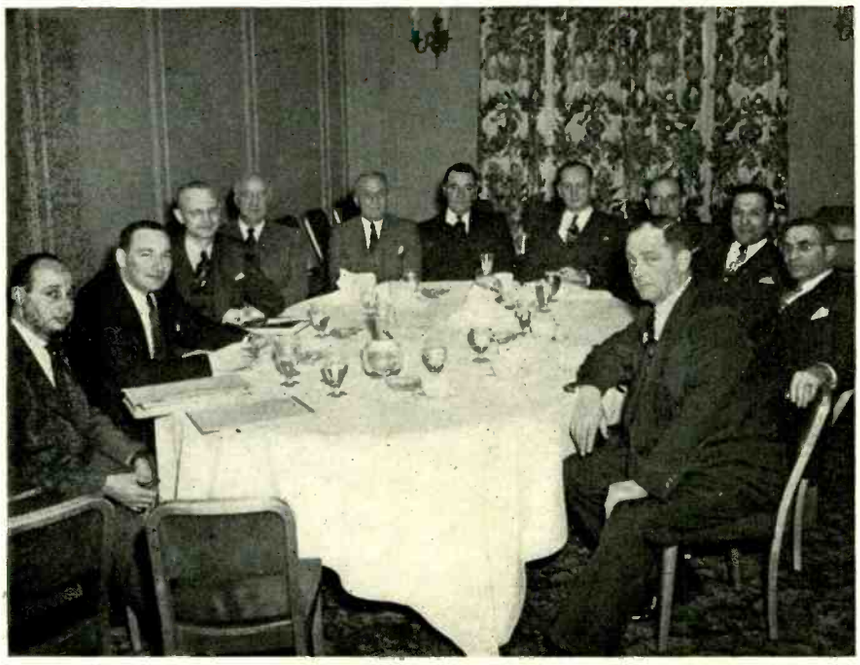
Simpson

INSTRUMENTS THAT STAY ACCURATE


NEW SIMPSON
WIDE RANGE
SIGNAL GENERATOR
FOR AM AND FM
Simpson
SIGNAL GENERATOR
MODEL 415
MADE IN U.S.A.
MULTIPLIER
WATCH FOR NEW SIMPSON DEVELOPMENTS . . . THEY ARE WORTH WAITING FOR

In & Around the Trade

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



Board of Directors of the Radio Parts and Electronic Equipment Shows, Inc., meets across the festive board. Keynote dinner (see below) and arrangements for exhibitors and exhibits are but a small part of the tremendous job these worthies have undertaken for the industry. Worthies, left to right; K. C. Prince, J. J. Kahn, H. W. Clough, Judge Van Allen, B. Geddes, L. Muter, R. Almy, S. Poncher, J. Berman, C. Golenpaul, W. O. Schoning.

Radio Parts & Equipment Show
KEYNOTE DINNER

THE first post-war get-together — the initial reconversion gathering of manufacturers and distributors — will open with an industry-wide business meeting. The keynote dinner of the 1946 Radio Parts and Electronic Equipment Conference and Show will take place on Monday, May 13, 7 P.M., in the Grand Ballroom of Stevens Hotel, Chicago.

A well-known business leader will be the speaker of the evening. He will discuss current business practices as they affect the problems of the radio and electronic industry.

Space limitations will permit the acceptance of only the first 1500 reservations. Reservations are at the rate of $5. per plate, or $50. per table of ten.

Everybody is welcome. Use the coupon below for your reservation.

PLEASE RESERVE..... plates for the KEYNOTE DINNER of the 1946 RADIO PARTS and ELECTRONIC EQUIPMENT CONFERENCE and SHOW. The following persons connected with this company will attend:

Name..... *Title or Position*.....

Name..... *Title or Position*.....

Name..... *Title or Position*.....

Name..... *Title or Position*.....

Check for $5.00 per plate is enclosed herewith. Please send our Keynote Dinner tickets by return mail to ⟶

Name of Company.....

Signature.....

Address.....

AT THE SHOW

Trade Show Luncheon

Mr. Irvin I. Aron, national president of The Representatives of Radio Parts Manufacturers, Inc., has announced tentative plans for an open luncheon for all members in good standing to be held at the Hotel Stevens, Chicago, at 1:00 P.M. Monday, May 13th, 1946. At this luncheon an open forum will be held to give all members an opportunity to offer any suggestions or express their opinions to the Board of Governors and to offer any resolutions for adoption by the national body.

Universal Display

"Something new, something old". That will be the theme for booth no. 41 at the May Chicago Radio Parts Show. Universal Microphone Co., Inglewood, Cal., is sending its president, James L. Fouch, with 1946-'47 microphone styles and, for comparative purposes, some of those made in the west coast factory between 1928-'35. The oldtime models will bring chuckles for any audience. Engineering and design have streamlined microphones since the early days. Universal will also feature recording components for which it has re-tooled and gone into production.

Vertrod to Entertain

Vertrod Corporation of 60 East 42nd Street, New York City, manufacturers of aerials exclusively, in various price ranges, for communications, broadcast, A.M., F.M., short wave, television, etc., announces the following representatives:

R. A. Adams Co., 18288 Appoline Avenue, Detroit (21), Michigan, covering the State of Michigan.

Art Cerf & Co., 744 Broad St., Newark (2), New Jersey, covering upper New York State, Southern New Jersey, Eastern Pennsylvania (to Harrisburg), Maryland, Delaware, District of Columbia, Virgina and all New England.

Paul M. Cornell, 422 Silsby Road, University Heights, Cleveland, Ohio, covering Ohio.

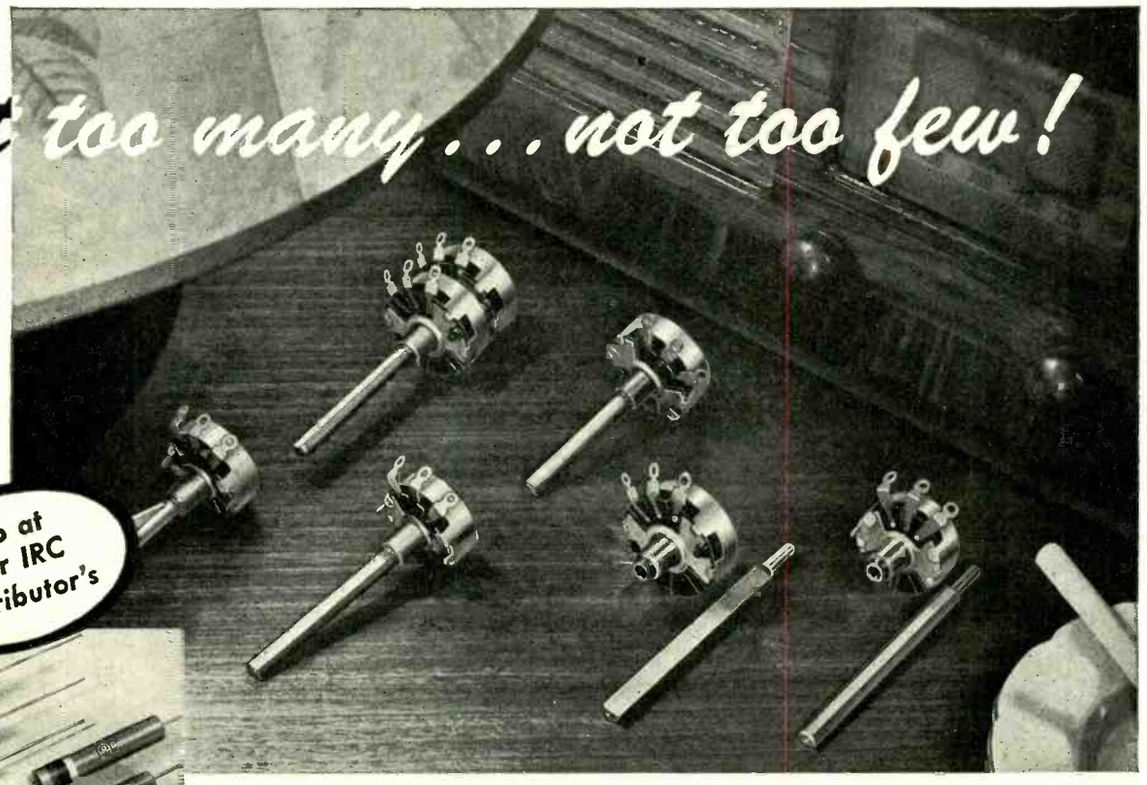
S. S. Egert, 11 Park Place, New York (7) covering Metropolitan New York.

Henry Feldman of 1935 Bay Street, Los Angeels (21), California, covering Southern California.

Halliday & McLoud, 711 Colorado Bldg., Denver (2), Colorado, covering Colorado, Wyoming, New Mexico, Utah, Montana, Idaho, and El Paso County, Texas.

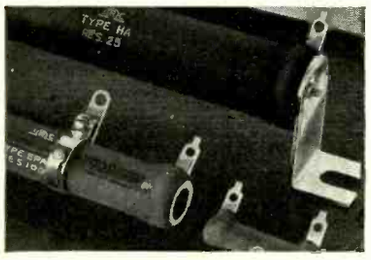
[*see page* 12]

Not too many . . . not too few!

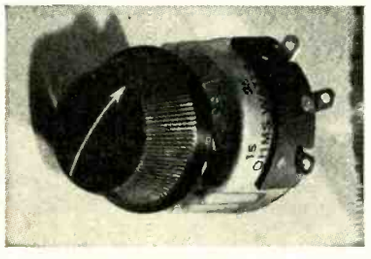


Also at your IRC Distributor's

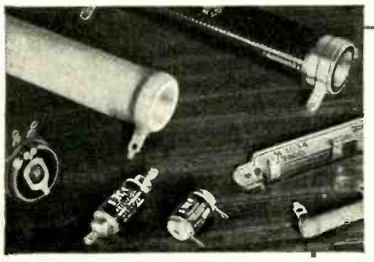
TYPE BT INSULATED METALLIZED and TYPE BW INSULATED WIRE WOUNDS ... the perfect combination.



POWER WIRE WOUNDS ... rugged, moisture proof, completely dependable.



POWER RHEOSTATS (above), Precisions, Wire Wound Controls, Bleeders, Non-inductive Wire Wounds, etc. (below)—for many service needs.



The IRC *Century Line* is a commonsense selection of the controls you need for complete service

The controls in the *IRC Century Line* were carefully selected after exhaustive study of IRC sales records and of the requirements of receivers and equipment now in use.

These studies showed that the number of types previously listed could be reduced considerably, yet give adequate coverage. But it also proved that reducing the number of available types to anything *less* than the 100 now comprising the Century Line, would make the service engineer's replacement problem extremely difficult.

On that basis, we established the Century Line—not too many, not too few—but just right to give you properly designed, easily installed controls for the widest variety of replacement needs.

Best of all, it's *not* necessary for you to actually stock all the 100 Century Line types! We recommend you maintain a minimum stock of at least the 18 Type D Controls listed on page 6 of IRC Catalog #50—they'll handle 87% of your replacements—and you can depend upon your IRC distributor for other types, as required.

And don't forget, *only IRC controls* give you such quiet, smooth, dependable performance! . . . because they're the only controls with the famous IRC Metallized Element, the Five Finger Contactor, and the Silent Spiral Connector!

YOUR IRC DISTRIBUTOR is the man to know when you need *any type* of resistor . . . there is an IRC resistance unit for almost every servicing requirement. Ask him for your copy of IRC Service Catalog #50.

FOR BETTER-THAN-STANDARD QUALITY... *Standardize on*

PREFERRED FOR PERFORMANCE • IRC • FIXED & VARIABLE RESISTORS

INTERNATIONAL RESISTANCE CO.

Dept. 22-D 401 N. BROAD ST., PHILA. 8, PA.

Canadian Licensee: International Resistance Co., Ltd., Toronto

MAKERS OF MORE TYPES OF RESISTANCE UNITS, IN MORE SHAPES, FOR MORE APPLICATIONS, THAN ANY OTHER MANUFACTURER IN THE WORLD.

In Trade

[*from page* 10]

AT THE SHOW

Kansas City (2), Missouri, covering Missouri, Nebraska, West Iowa and Kansas.

Al Knodell & Co., 2018 Touhy Ave., Chicago (45), Ill., covering Metropolitan Chicago.

J. W. Marsh Co., 1515-19 West Pico Blvd., Los Angeles (15), California, covering Arizona and Western Nevada.

Marsh Agencies, 110 Battery St., Seattle (1), Washington, covering Washington, Oregon, and Alaska.

Southern Sellers, 918 Union St., New Orleans, Louisiana, covering Louisiana, Mississippi, Southern Alabama and Memphis, Tenn.

Nickerson & Rudat of 383 Brannan St., San Francisco, Calif., covering northern California, including the counties of Monterey, Kings, Tulare and Inyo, and Eastern Nevada.

J. Earl Smith, P.O. Box 1805, Dallas, Texas, covering Oklahoma, Arkansas and Texas except El Paso County.

Herb Erickson, P.O. Box 179, Hendersonville, North Carolina, covering North and South Carolina, Florida, Georgia, Tennessee, except Memphis, Northern Alabama.

For the May 13-16 Radio Parts Show, all these representatives and the officials of Vertrod Corporation will entertain in their suite at the Continental Hotel, 505 N. Michigan Ave., which is a few blocks' run north on Michigan Boulevard from the Stevens Hotel Show Headquarters.

RCA Tube Department Exhibit

A completely new line of merchandising store fixtures and Service-Setup, especially designed ot increase sales for tube and parts distributors and dealers, will be the highlight of the RCA Tube Renewal Sales Department's exhibit at the 1946 Radio Parts and Electronic Equipment Conference and Show, being held at the Hotel Stevens, Chicago, May 13 to 16. This exhibit will be on the third floor of the hotel, with the RCA Engineering Products and Sound Equipment exhibits located in the main exhibition hall.

The new merchandising aids are adaptable to any floor layout and are geared to accommodate any business volume. Distributors and dealers will be shown model store layouts, illustrating how the new RCA "Sales Servers" can be used in their own stores, revitalizing their tube and parts sales

[*see page* 16]

The dealer to turn

Loud voices daily demand more radios of dealer Joe Peters. Joe hates to turn down this volume—it's far greater than his supply of sets—and he wonders why his manufacturer keeps sending him customers by advertising in the Post. (*And Post ads get RESULTS because people LIKE to read advertising in the Post—far more than in any other magazine.*)

who hated down the volume

In Joe's community (and in yours, too!), most of the best-buying families are Saturday Evening Post fans! (*A recent national survey showed that 1 in every 3 Post-reading families expects to buy a new radio at an average price of* $150.) And the Post has *influence* and *authority* that make advertising bring results which can be seen and felt at your store.

So, months later, when radios are again plentiful, Joe sees proof of a fact so many wise advertisers know—that consistent advertising, even during a seller's market, pays off in the end. The Post campaign has helped keep demand for this brand warmed up and ready to be tuned in when the dealer needs it most.

IT PAYS TO HAVE THE POST PAVE THE WAY

In Trade

[*from page* 12]

AT THE SHOW

activities. Store planning and merchandising experts will be available to assist in laying out the new units according to the floor plans of the individual distributors. In addition to the display of the new store fixtures, there will also be exhibits of the latest developments in electron tubes, test equipment, replacement parts, and batteries.

Representing the RCA Tube Department at the convention will be D. J. Finn, manager of the Renewal Sales Department; D. M. Branigan, A. C. Duncan, Jr., J. H. Owens, J. R. Malone of the Advertising and Sales Promotion Department; and L. A. Goodwin, Jr., manager of the Test and Measuring Equipment Department.

Walsco "40" Line

Walter L. Schott Company of Beverly Hills, California, who has been marketing Electronic Hardware items for the radio service man under the name of Walsco products, is readying a new promotional campaign featuring their well-known one-price merchandising plan. Every item of Electronic Hardware carried in the line is packaged in separate, attractive, dust-proof cellophane bags. This packaging idea facilitates re-ordering, eliminates confusion and simplifies the taking of inventory.

This line will be featured at Booth 116 at the Radio Show. Mr. Schott will be at the Show to meet the trade personally. Donald J. Terwilliger, sales and advertising manager, will also attend.

RCA's Low Cost Package Sound Kit at Show

A complete new line of low cost sound equipment will be displayed by the Engineering Products Department of the RCA Victor Division for the first time at the 1946 Radio Parts and Electronic Equipment Conference and Show to be held at the Hotel Stevens, Chicago, May 13 to 16, it is announced by the Sound Equipment Section of the Department. The various items comprising this complete sound line are being presented as a variety of RCA Package Sound Kits, and are engineered and designed specifically for smaller establishments, night clubs, small lecture and concert halls, retail stores, classrooms and similar locations.

[*see page* 51]

BUSINESS GETTERS

With direct mail, you can multiply the prospects who come to your door—bring in new customers to keep your business and your profits steadily growing. Raytheon Bonded Electronic Technicians have a big story to tell—and have effective self-mailers to tell that story to the public.

These direct mail pieces are only a part of the broad program of *selling helps* made available *only* to Raytheon Bonded Electronic Technicians. Bonded service means better customer relations. For full details to qualify, see your Raytheon distributor today.

RAYTHEON
MANUFACTURING COMPANY

Excellence in Electronics

ANOTHER REASON WHY IT PAYS TO QUALIFY AS A RAYTHEON BONDED ELECTRONIC TECHNICIAN

RADIO RECEIVING TUBE DIVISION
NEWTON, MASS. • NEW YORK • CHICAGO

4 Good Reasons!

. . . why profit-minded dealers and distributors everywhere are stocking E·L Vibrators.

SIMPLIFIED STOCK!
LOWER STOCK INVESTMENT!
FASTER TURNOVER!
GREATER PROFITS!

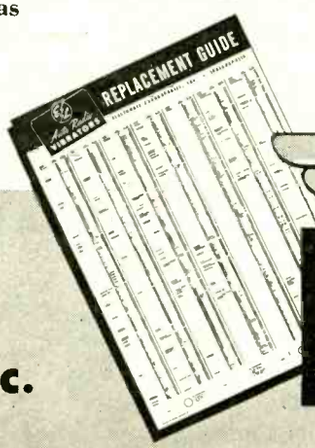
That's the story in a nutshell! With E·L 's unique standardization plan, now you need stock only 4 models to serve the 1122 auto-radio models which comprise 95 per cent of the vibrator replacement demand.

LONGER LIFE . . . PROVEN DEPENDABILITY

E·L Vibrators are of the balanced resonance type, with 8 contacts instead of 4—*twice* as many as other makes in the non-synchronous types. Tests show they provide *33 per cent longer vibrator life*, with output and starting voltages held virtually constant throughout the entire life-span. The exclusive features and outstanding performance of E·L Vibrators are a product of exhaustive research into auto-radio requirements.

Order from your E·L distributor today! Your shipment will include a free copy of the new E·L Auto-Radio Vibrator Replacement Guide designed for your handy reference.

ASK ABOUT "UTILIPHONE". . . E·L 's new, practical, low-cost 2-station intercommunication system. Ideal for offices, factories, homes and schools. No installation service is required . . . gives long-time, trouble-free operation.



Electronic
LABORATORIES, INC.
INDIANAPOLIS

E·L Auto Radio VIBRATORS

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

6 APPLIANCE LINES PRICE-TAGGED BY OPA —but:

Figures released show cost-absorption trend at production end. Industry looks for price changes which will unfreeze OPA limitations on essential profit margins for makers, distributors & dealers. . .

THE sense, text and context of a report issued by OPA recently has it that the prospects are good for a high rate of production of durables when more raw materials and workers become available. Once these obstacles are overcome, the report states, production will be in full swing. But even if in 1946 we equal—or double—the 1939 range of producing durable goods, pent-up demand will still be far greater than supply. Here are some examples of demand compared with supply in the durable goods field, by lines:

Refrigerators—Present demand at least 5 times greater than in 1939.

Washing Machines — Present demand at least 7 times greater than in 1939.

Vacuum Cleaners—Present demand at least 6 times greater than in 1939.

Electric Irons—Present demand at least 6 times greater than in 1939.

Electric Toasters—Present demand at least 6 times greater than in 1939.

Here are some facts about production and ceiling prices of consumer durables. In general, the prices of these products will be about the same as in 1942. In some cases they will be lower. In others, a little higher. But the average will be about the same. Consumer durable pricing regulations, in general, require manufacture of the same proportion of low priced to high priced lines as was the case before the war.

WASHING MACHINES

Prices have been set on nearly all models. Retail price levels the same as October 1941. Examples:

Brand	*Model*	*Oct. 1941 Price Zone 1*	*1946 Price Zone 1*
Maytag	J2L	104.95	104.95
Dexter	452E	64.95	64.95
ABC	241 S	69.95	69.95
Blackstone	134	59.95	59.95

REFRIGERATORS

Prices have been set on nearly all models. The level of retail prices is, on the average, about the same as in October 1942. Examples:

Brand	*Model*	*1942 Price*	*1946 Price*
Norge	M746—7 ft.	199.95 (Zone 1)*	193.95 (Zone 1)
Crosley	SS746—7 ft.	152.95 (Zone 1)	148.50 (Zone 1)
Westinghouse	B7-46—7 ft.	177.95 (Zone 1) 199.95 (Zone 5)	179.95 (National)
GM Frigidaire	MP 17—7 ft.	164.35 (Zone 1) 170.34 (Zone 3)	184.75 (Independent Distributors) 186.75 (Factory Branches)
General Electric	LB 7—7 ft.	152.20 (Zone 1) 164.20 (Zone 4)	151.50 (National)

Price includes tax and delivery. *"Zones" mean manufacturers' price area. Prices change from Zone to Zone depending on transportation costs. **Increase in price over 1942 because, unlike other manufacturers, the company did not adjust price schedules before 1942.

VACUUM CLEANERS

Prices have been set on all models. Retail price levels are the same or less than 1942. Examples:

Brand	*Model*	*1942 Price*	*1946 Price*
Streamliner	L65D Cylinder Type with 13 Attachments	89.95	64.95 (National)
Eureka	W-75 Cylinder Type with 12 Attachments	66.50	66.50 (National)
Electrolux	XXX Cylinder Type with 9 Attachments	69.75	69.75 (National)
GE	AUT 150 Cylinder Type with 10 Attachments	59.95	59.95 (National)
Hoover	26 Floor Type Motor Driven Agitator	68.00	68.00 (National)
	2600 10 Piece Set of Cleaning Tools	16.50	16.50 (National)

ELECTRIC RANGES

Prices have been set on about 75 per cent of expected production. Retail price levels same as 1942. Examples:

Prices include Federal Excise Tax and installation to facilities provided by purchaser. "Pigtail" (cord) cost may change price by plus or minus $3.50.

Brand	*Model*	*1942 Price*	*1946 Price*
Gibson	ER 394-RV	169.50 (Zone 1)	169.50 (Zone 1)
Frigidaire	B-17	173.35 (Zone 1)	173.35 (Zone 1)
Norge	E-400	193.95 (Zone 1)	193.95 (Zone 1)
GE	APL 46A8	106.25 (National)	106.25 (National)
Hotpoint	HB 8	106.25 (National)	106.25 (National)

SMALL APPLIANCES

Mass production slow. The bulk of small appliances made by old line manufacturers will return at about 1942 price levels. There will probably be a slight price increase on low end items in order to get such products on the market more quickly. The following examples of electric iron prices are illustrations of the higher priced models now on the market. These are comparable to 1942 prices, which include tax.

Brand of Iron	*Model*	*Price*
Landers, Frary & Clark	Universal, 0181 autom., 1000 W.	9.40
Superior Electr. Prods.	205 W non-autom., 660 W	3.65
Knapp-Monarch	400R autom., 1000 W.	5.95

ELECTRIC ALARM CLOCKS

Prices will remain at approximately prewar prices. There will probably be slight increases in prices of low end products. Examples:

Brand	*Model*	*Price—same as 1942*
Warren Telechron	Telalarm—Self Start	4.95
Hammond	Firefly—Manual Start	3.95
Westclox	Logan—Self Start	4.95

Tube Prices Show Cost Absorption

Radio tube manufacturers may sell on an adjustable pricing basis March 15, and ending on the day increased ceiling prices for radio tubes become effective. This allows manufacturers of radio tubes to make an agreement with buyers for the delivery of the tubes at prices to be adjusted upward after OPA issues an action increasing the ceiling prices of radio tubes.

The action will allow a manufacturers' price increase of 15.5 percent over the present ceiling prices for radio receiving tubes sold as original equipment to radio set producers. It also will allow a manufacturers' increase of 20 percent over the October 1, 1941, prices for radio receiving tubes when sold to wholesalers and retailers. These price increases also cover special purpose tubes such as are used in public address systems, amplifiers, hearing aids, etc.

***The increased manufacturers' prices will not increase the retail price of radio tubes because wholesalers and retailers will be required to absorb the manufacturers' increase.* No decision has been made regarding the effect of the action on prices for radio sets.**

Several months ago, a manufacturers' price increase of 10.4 percent over the October 1, 1941, prices was granted on sales of radio receiving tubes when sold as original equipment for the production of radio sets. Coupled with the new increase of 15.5 percent, manufacturers will receive a total increase of 27.5 percent over their October 1, 1941, prices such sales. Under the new action distributors and retailers will be required to share in absorbing the manufacturers' price increase. *As a result, wholesalers' margins will be reduced from 37.5 to 28.6 percent. Retailers' mark-ups will be reduced from 40 percent to 37 percent.*

(Order No. 587 to Revised Maximum Price Regulation 136—effective March 15, 1946.)

"Making" Salesmen

A "personalized field training" program, for "selective dealers," aimed at ultimately reaching 20,000 retail appliance salesmen, has been launched by Edison General Electric (Hotpoint) Appliance Co. Four "regional training teams" each directed by a training specialist from company headquarters will conduct clinics across the nation, according to Ward R. Schafer, vice president in charge of sales. Cooperating with the headquarter personnel will be the key personnel from regional sales offices and sales heads of the company's distributors. The program had been in the process of development for more than a year. "Refresher" work for returning salesmen and fundamental training for new salesmen make up the background for the courses.

Because of the widely publicized pent-up demand for home appliances, company officials predicted that many thousands of returning GIs, as well as recently released war workers, will turn to appliance selling as permanent careers. "We feel that training for careers in the appliance business is a definite part of our obligation to the men who will serve as 'front line spokesmen' for our industry. While our program is not aimed at teaching these men the theory of selling, we will ground them in the fundamentals of home appliance operation," Mr. Schafer said. The material used in the Hotpoint course includes "visual devices" for training such as used in the armed services and industry for wartime speed up of training.

At the conclusion of each training school the trainees are required to pass tests, both in the theory and operation of the equipment. As a direct follow-up to the "personalized courses" the company will supply visual charts and other materials to distributors for refresher training for salesmen who enter the business at later dates.

During the months in which the program was being developed, Mr. Schafer said that approximately 300 company regional and distributor sales principals came to Chicago to take the course in week-long sessions. That course included product and promotional materials, as well as product service on the company's lines of appliances.

The over-all program is being directed by Robert J. Caswell, with John Russell, and John Schneider assisting in developing material. The service schools are under the direction of D. C. Marble, manager of the service division, with Richard Schneberger serving as service training director.

HOW TO BUY FOR STOCK

PROFIT-WISE dealers study their local markets, find out what their customers want in the line of appliances and carefully study records of previous sales. By taking the information thus secured and adding to it the facts they have gleaned from looking over competitive assortments and analyzing their stock on hand, efficient dealers can devise a simple buying plan to meet the needs of their business.

Buying is the first operating function in the store. Buying provides the *food for the business*—the merchandise which makes operation and sales possible. A good buying job stocks the store with merchandise customers want, in the *types, sizes* and *selections* they need, at the *time* they want to buy.

Know Your Customers

There is no mystery involved in intelligent buying. The good buyer studies his customers and their needs and keeps a record of their wants. He keeps informed about what his competitors are doing and maintains a simple set of records which will give him the facts he needs every day and assure that merchandise ordered gets into the store, is properly recorded, and promptly paid for. The essential records which will help you do an intelligent buying job are:

1. *A simple Want-Slip Form:* There need be nothing formal about this record. All that is needed is a pad on which can be recorded customer requests for merchandise out of stock, but which your store should carry. This form can also be used for special orders. One of the advantages of small scale retailing is that you can often give special attention to the personal needs of your customers. Much of your buying can be on a special order basis, or at least, with the personal needs of your customers in mind.

2. *A Purchase Order Form:* Every store, regardless of its size, will find it advantageous to use a purchase order form. Such a form is essential because—

- **a) An order is a contract and should be in writing.**
- **b) An order form provides the proper space for stipulating the conditions of the contract.**
- **c) The order form can give instructions to the shipper which, when followed may reduce transportation costs and speed up the shipment.**
- **d) It provides a record for purchase follow-up.**

3. *A Receiving Record.* This serves as a record of incoming merchandise for marking, stocking and accounts payable purposes.

4. *A permanent accounts payable record.* This record makes possible prompt payment of the purchase and serves as a permanent record for your guidance.

Most small store merchants will keep their records by hand. However, if you want more carefully prepared and clearer records, and if you want to show evidence of being businesslike and modern in your methods, you may want to make these records on a machine. The only business machines recommended for a good small store buying job are an adding machine and a typewriter.

The simple steps, therefore, are (1) to check the invoice with the goods received and also check it for accuracy of its computations; (2) record it, along with other invoices for the day, in the daily transaction report; and (3) get it into your books.

Permanent Features of the National Market for Home Radios and Appliances

1. The use of electricity has doubled in the last ten years (1935-45) while the unit cost of electricity has been cut just about in half. If this rate of growth continues, *the use of electricity will again double itself by 1955!*

2. *Each year,* new and existing homes will require about 3,000,000 refrigerators; 800,000 electric ranges; 2,500,000 washing machines; 2,000,000 vacuum cleaners; and 5,000,000 radio receivers.

The greater the number of "residential connected customers", the more radios and appliances dealers can sell to the American family.

The sooner the 95 per cent of American homes that are today *without* adequate wiring get "wired up" with sufficiently heavy wire, enough circuits, and the new circuit protection devices — the sooner will the full strength of the *potential* radio and appliance market become a millionfold dollar *reality* for our dealers.

Minerva Corporation executives help in playback of recording by internationally famous concert pianist Simon Barere, on a post-war Minerva radio-phono console set. L. to r. Sydney R. Berens, president; Herman H. Weissberger, chief engineer; virtuoso Barere.

"Look-see" show window and "come-on-in" clear glass doors framed in heavy aluminum tempt passersby on lower 5th Avenue to stop and shop. Product visibility is continuous for depth-of-store. Below: The old show-windows.

Features "Walk-In" Shopping

New radio-appliance-record store opens in sub-center business district, attracts shoppers with clear-view store front. Customer traffic peak during lunch hours gives dealer and staff intensive selling opportunities.

WHAT is apparently the only radio and appliance store (barring fancy department stores) on 5th Avenue, New York, opened up recently. And on the day of its opening—a blustery day in mid-March—there was a rush of business. Several times during that day, the doors had to be closed to relieve the pressure. Advance orders (but no deposits) were taken that day on items costing $5 and over. Customers were interested mostly in toasters, mixers, irons, clocks and radio receivers.

The Selling

Advisedly there was no formal announcement of the opening. Mr. Lipson, president of Howbar Inc., infers that the rush was due a good deal to the open type of "walk-in" store front. It is made entirely of glass. It permits a full view of the merchandise displayed on the low show window platform, and as full a view of the store beyond and *its* display of still more merchandise. Add to this tempting "look-see-come-in" kind of store front and entrance design, the stark fact of people being over-hungry for merchandise — and one can readily appreciate the fact that even as the store *opened up* for business, it had also to *close up* for business *reasons* — or else become hopelessly flooded with a confusion of orders. As much as three thousand dollars' worth of orders were on the books before the end of the first day.

In some ways, Mr. Lipson rather regrets all the orders they accepted on that day. Short on most lines of merchandise, deliveries could at best be promised for an uncertain six weeks to two months ahead. By then many of the orders may turn sour, he feels. So, for the time being management's policy is to take no more orders from walk-in customers on the "slow" items such as toasters, irons, cleaners, mixers, radios and refrigerators.

As the merchandise for which they took orders on "that day" comes in, Howbar sends out cards to the customers giving them a certain time limit in which to pick up their purchases. If they don't come in within the time limit, the merchandise automatically goes on the market and is sold to other customers, as they come in.

"Take home" items, such as permanent phono needles, floor lamps, broilers, juicers, pressure cookers, heating pads, health ray and sun lamps, razors, cutlery sets, door chimes and table novelties are being sold. These are of course fill-in merchandise items. The

Customer's close-up: **Floor space in foreground and on platforms at walls (left) is reserved for console radio sets. Merchandise now shown there: floor lamps, health lamps, table novelties. Left, shoppers' inquiry and cashier's booth. Extreme right, customer gets demonstration of new refrigerator. Mid-center, island displays for table model radio line samples. Background left, wall counter displays broilers, pressure cookers, heating pads, juicers. Note pattern of linoleum floor with lines of direction leading deeper into store. Shadow box is for clock display; stem-mounted wall lights add attention-value.**

main, normal selling job will be on home appliances and radios — which is this dealer's ambition to handle as soon as available — even as you and I.

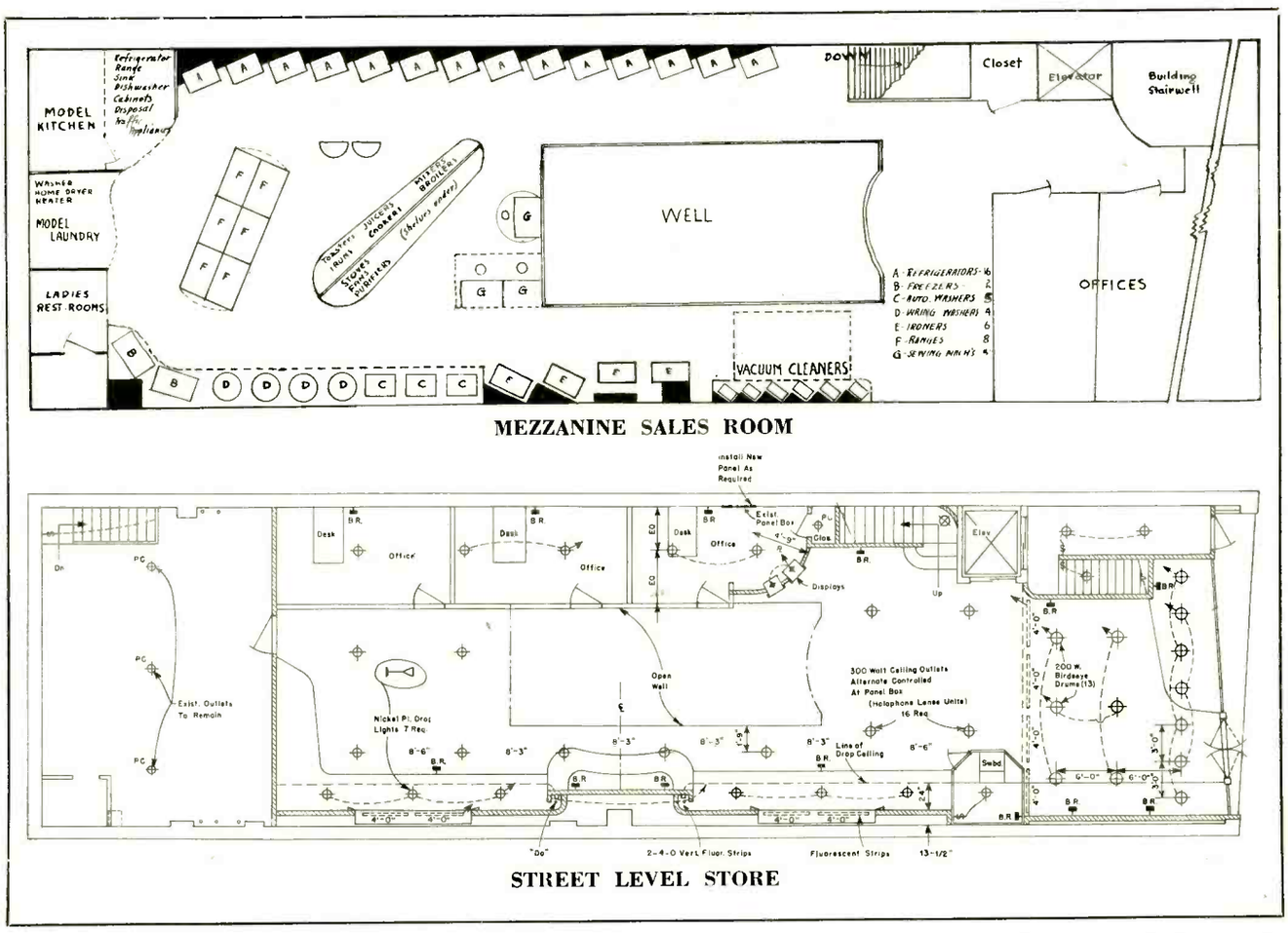
In the meantime, Mr. Lipson indicates that there is a program for a model laundry and a model kitchen. They will be set up on the mezzanine floor (see plans) where it is expected that all the major home appliances will be concentrated for the most effective merchandising. The items displayed here will include refrigerators, washing machines, ironers, vacuum cleaners, dishwashers, water heaters, unit air conditioners, ranges.

The main store will carry entertainment merchandise — radios, records and gift items. At the present time Howbar is handling on franchise the lines of Kelvinator, Admiral, Philco, Norge, RCA, Emerson, Fada, General Electric, Bendix, Thor, Whirlpool. Other lines and other franchises are in negotiation.

Trade comes from a mixed and very numerous daytime population. The store — at 224 Fifth Avenue — is located in the midst of any number of skyscraper office and loft buildings (18 stories and up). It is very close to the giant office buildings occupied separately by Metropolitan Life and New York Life Insurance companies. There is also a heavy concentration of buildings housing the needle trades — which is a feature of this part of Manhattan.

Customer traffic of the "walk-in" variety is heaviest between the hours of 12 and 2 PM, five days a week. The customers range from key executives to white collar workers — about evenly divided between men and women. The most frequent type of

At day's end store manager Stadt (left) & president Lipson check displays.



***Top*, dealer's own plan of merchandise displays for mezzanine Home Center, adapted from "Modernneering" layouts by Landers, Frary & Clark. See key for explanation of various wall and island displays of tie-in appliances. Street level store will carry radios and records; note layout of display and general in-store lighting (explained in text). Opposite built-in counter and platform displays are sales offices for instalment and major cash transactions.**

sale consists of "pick-up" buys to take home to the family, with a sprinkling of "impulse" buying in the novelty items.

Further sources of business will be developed through the employment of a staff of outside salesmen. They will be fed leads through local advertising, for which an agency has already been appointed. The salesmen will cover the New York Metropolitan area —within a radius of 50 miles—on certain of the major household appliance lines for which Howbar has acquired area-wide franchises.

The Store

The store is literally "entered" by every passer-by. The all-glass front leaves nothing to the imagination. Show window and the store beyond it are all one in their concentrated effect of merchandise display. Tracks of lighting, arranged in concealed overhead spot lamps and enclosed standard ceiling lights, add their inducement to sidewalk traffic to pause, look, and walk in. The way the glass entrance doors are set at an angle (architects call it re-entrant angle, for it is an inside "kink" in the wall) running into the building, makes it subtly but effectively easier for people to float into the store.

There's no mystery, no interference with people's curiosity and tendency to stop and stare, given half a chance. All you have to do to find proof of this bit of human behavior is to watch the "sidewalk superintendents" clot around various knotholes provided in fences surrounding building operations. People all want a look-in. And in the Howbar store front they get a most complete look-in. The front contrasts with other stores in the immediate vicinity, the result of older traditions in store design and show window display. The front offers no resistance, in other words, to even a reluctant or doubtful or casual shopper. This is demonstrated daily especially during the noon hours, when hordes of office workers are let loose.

The store (at 24th Street) is far enough from the highly concentrated department store and specialty shop district on 34th Street (where are Macy's, Altman's, McCreery's, and hosts of specialty shops) to really cash in on all the possible noon-hour traffic. Weekdays, office workers don't have enough time to go too far away for their shopping. Weekdays, Howbar gets more than its share of customer traffic, which is all the more numerous since there is literally no barrier at all between their curiosity about new home appliances and its satisfaction. In Mr. Lipson's opinion, what may be called the frankness of the store front, its over-all, all-revealing clear, thick plate glass windows are in a large measure responsible for the unusual count of customer traffic.

In detail, the plate glass front is framed to the second floor with black Carrara glass by Libbey Owens. The show windows are ¼-inch thick Pittsburgh plate glass. The doors are of ¾-inch thick Herculite plate, 2½ by 7 feet each, framed in heavy aluminum with Lucite pull handles, locks inserted on bottom, with Rixon heavy duty floor hinges.

The Lighting

Inside, the lighting scheme was carefully planned for proper product display lighting and general illumination,

not to mention the strategic traffic-inducing lighting in the forepart of the store. In the main first floor store, overhead ceiling lights are placed 8 feet apart. 200-watt G.E. incandescent lamps are used in close-hung box fixtures. Bottoms carry Holophane broad-beam lenses, mounted in hinged access doors. The bulbs are now clear glass, but will be replaced with inside frosted ones as soon as available.

The show window lights are 6 in number. They are recess louvered Downlite reflector lamps — 150 watt incandescent G.E. R40 Spot and Flood Mazdas set at 45-degree angles to focus on the low show window platform and its variety of merchandise. Immediately inside the entrance—the "reception foyer"—are 6 ceiling lights, also recessed louvered Downlite, with the same type of bulbs, in a vertical mount. Fixtures are by Gotham Lighting Corp., New York.

Interior side wall display lighting consists of a total of 9 fixtures, with incandescent bulbs. They are stem mounted Streamlites in satin-chrome finish, with G.E. R40 spot and flood bulbs, projecting from the side walls (see illustration). Fluorescent lights are also used. They are for cove lighting—in the vertical bays each side of the kidney-shaped wall counter display. A total of seven standard 40-watt units are used, mounted in Fluor-O-Trough fixtures. All lights are controlled by individual switches in a central panel.

Floors are Armstrong linoleum, in three tones, arranged in tile and strip effects, laid diagonally to avoid monotony. This floor is used throughout the main store and for the sales offices at one side. But the entrance "reception" portion of the store, where inquiry traffic, curiosity traffic, and small item purchase traffic is naturally the heaviest, is floored with terrazzo marble in metal strips. This portion of the store area also is a foyer leading to the elevator which connects with the mezzanine store above.

Island displays were built on the job. Framed of two-by-fours, with Tekwood composition sides, they cost less than half compared with estimates received from outside store fixture makers. Further, it would have taken longer to get them finished, as is usual nowadays with any contracted work having to do with lumber and skilled labor. However, the wall counter display and the low platform displays along the rest of the wall (at left of picture) were made off the premises by a regular cabinetmaker, who also made the partitions for the sales offices.

The radio servicing department is located in rear of main store (behind the glass wall shown at rear of photo).

"Basic" display fixtures include built-in low platforms (left) and kidney-shaped counter (middle background)—see plans opposite. Note shadow box lighted with indirect fluorescent and incandescent stem drop fixtures. Floor pattern is intended to make it unconsciously easier for people to walk further into store. Along right wall are individual customer-sales offices; at rear, behind glass wall are the radio servicing department and the shipping room. Enclosure in left foreground is for receptionist and cashier. Out of picture, at right foreground are the stairs and the elevator leading to mezzanine Home Center sales room, where dealer will concentrate major kitchen and home laundry appliance displays, plus smaller tie-in appliances. Comparatively narrow store gets widening effect through well placed lighting and pastel colored walls.

The room is large enough to include the shipping department as well. Executive offices will be located on the mezzanine floor. See display plan of this floor, for details of lines to be shown. Notice that island display table is set diagonally to allow traffic to pass on beyond to model kitchen and laundry displays. The island display table will carry "companion" traffic appliance items that go naturally with purchases of major kitchen appliances. The central merchandising thought here is to make the mezzanine truly a home appliance center.

At this time operating plans call for about five inside specialty salesmen for both selling floors, and about four outside specialty salesmen who will report to a field supervisor and will travel throughout the metropolitan area to cover Howbar's franchise territory on major household appliances. Floor salesmen are under the supervision of store manager N. P. Stadt, who has a background in radio and appliance selling extending over a period of 25 years.

The store is fully staffed with clerical and bookkeeping personnel. There is also a shipping clerk, and a receptionist and cashier. Floor selling policy requires that each salesman carry a small pocket memo pad (3 x 5) on which the item sold is merely noted. The customer is then taken to the cashier, who makes a record of the customer's name and address and enters the sale as a charge, cash or C.O.D. In the meantime, the purchase is being wrapped in the shipping room.

This simple procedure, according to Mr. Lipson, eliminates the use of sales books by the salesmen and leaves them free to do a better selling job, taking care of more customers, because the amount of paper work is cut down. Salesmen specialize in selling, rather than in becoming expert special order form fillers-in.

Term Sales

Instalment selling will be carried on as a full time activity by the firm. Howbar will employ a credit man who will be in full charge of this kind of selling. Instalment accounts will be financed directly by the store, without recourse to outside financial agencies. The customary one-third down payment as provided in Regulation W covering household electrical appliances will be a part of every instalment deal. These selling and financing policies have been set up by Mr. Lipson. His background includes the manufacture of lamps and electrical goods for over 17 years. A graduate engineer out of Rutgers U., he worked during the war as production control manager of the Remote Control Division of American Typefounders.

Other stores are contemplated in other parts of the greater New York area, and they will be opened as soon as more of the standard brands of merchandise are available from present distributive sources.

Above: Display mentions radios but records are shown. Discs are still the backbone of many a show-window display, as dealers scan delivery schedules for promised radios and home appliances. *Below:* High visibility version of listening booth for record customers, from Rathway Music Shop, N. J. Note fiddle-shaped flower vase, drum seats. Solid enclosures described in text.

SELL MORE

Higher unit sales per record customer, more "closings" per demonstration with help of built-in listening comfort features: Insulated booths, well-baffled speakers, improved amplifiers. Amplifier schematics on page 28.

by J. CARLISLE HOADLEY

FOR stores that have a record sales department, the value of presenting the records in a manner most pleasing to the public cannot be overemphasized. Albums and complete record lists should be attractively displayed, but, in addition, adequate means for auditory display of your offerings should be provided. By this I do *not* mean a haphazard arrangement of a cheap pickup, any old permanent needle, a wow-y turntable and a midget receiver. Such a combination is certainly not adequate to display the superiority of certain new low noise level high fidelity pressings, and is entirely inadequate to present records, a high percentage of which are recorded at a high level, giving rise to needle chatter which can be heard at twenty paces.

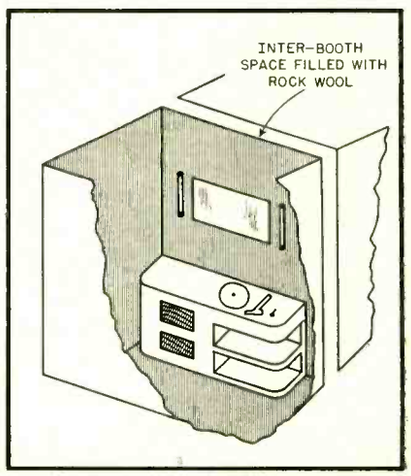
A customer will be indifferent in a shop that requires him to decide upon his purchases by forcing him to listen to new recordings he wants through the store noise level. Certainly, then, booths should be supplied. Not just a crowded little room, but an acoustically designed chamber, which not only shuts out store noise but also its neighboring booth's selections.

The booth should have a highly absorbent material facing the speaker of its phonograph, which will lower the hiss level and reduce the high frequency level without cutting out some higher frequencies, as a simple tone control would do. The speaker should be mounted in a corner of the booth, as this arrangement allows the speaker to match best acoustically the impedance of the room. This will add to the fullness of the low frequencies. A speaker 8″ in diameter is adequate if properly installed in a Bass Reflex Baffle, and will reproduce the range of nearly all records at the level required in such a small space.

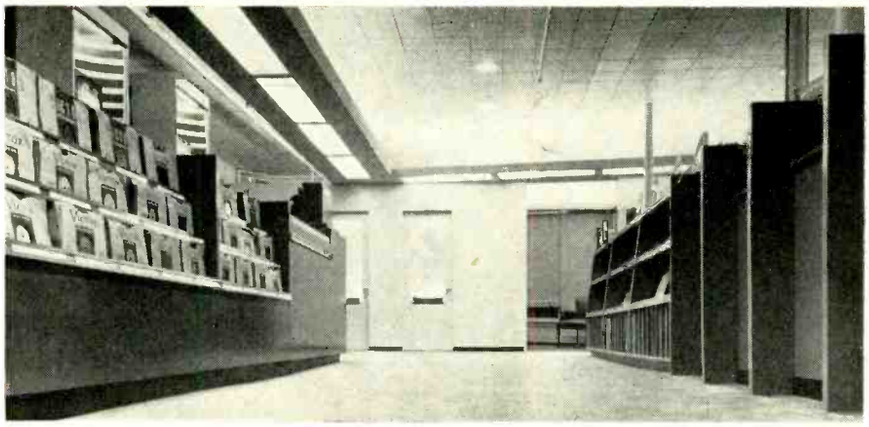
Both the pickup and the amplifier should be chosen with low distortion and low noise level in mind. It is here that a store's service department can spend a few profitable hours in building a system which will cost less and out-perform the average commercial article.

The pickup should be of the permanent needle type, such as the Astatic LP6. This pickup is not only rugged and the unit cheaply replaced, but it has an added advantage of cutting off above 5000 cycles per second. As the percentage of music above

Figure 3: Built-up speaker in baffle, installed with record player system in booth with blind-insulated wall.



DISCS



Above: **Enclosed listening booths, rear, plus stand-up listening stalls aid handling record shopper traffic. (Cronin Shop, Waltham, Mass.)** ***Below:*** **Record sales highlighted during National Baby Week, April 27th-May 4th, with portable Stensgaard designed Children's Record House (RCA-Victor) "rolled out" to make it easy for kids to select records. Listening booths at rear left.**

5000 C.P.S. on a shellac pressing is very low in respect to the noise, little is gained by extending the range above this value. The reduction in noise level is considerable.

It is a little known fact that if the high frequency response is peaked at some medium high frequency, say 4000 cycles per second, the effect is very nearly the same as flat response to 6000 cycles or higher, except for reduction in noise level.

Presenting your records with as low a hiss level as possible accomplishes several things. First, it allows the prospective customer to enjoy the record undistracted by other influences; second, if it sounds better than when played on his phonograph the chances are that he will become dissatisfied with his own and he will want to buy a better one. Last, but not least, if your record listening booth pleases the customer, and if the records sound good to him there, then he is likely to tell friends of his find.

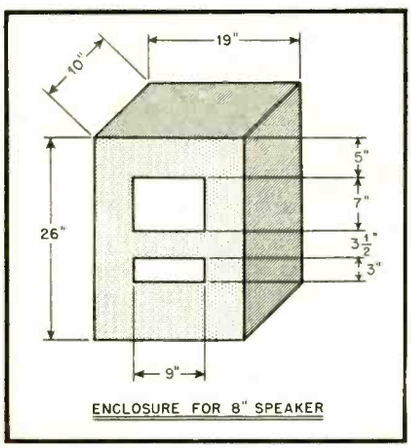
Let us discuss various way to build or improve the record demonstration amplifier.

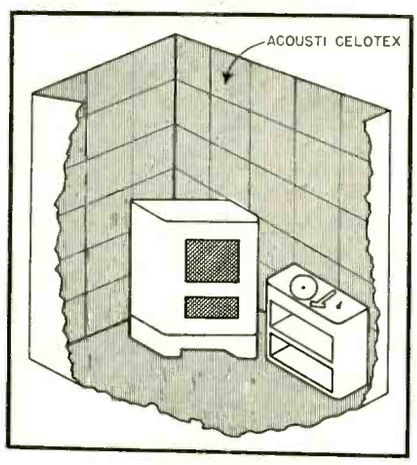
The most important goal to seek is low distortion; which indicates push-pull output, although sufficient feedback could be used in a single-sided output stage to give good results. *Figure 1* is the diagram of an amplifier which will do full justice to any recording. It has more than adequate power output and individual Bass and Treble controls. There is applied a generous amount of negative feedback to reduce distortion and hum, and it is this feedback circuit that is utilized also for the tone compensation. The transformers used should be of better than average quality.

In *Figure 2*, we find a small single-sided amplifier, which is more economical and which will provide very good results; it features high and low frequency tone controls, negative feedback and low cost. It will supply several watts of power, which is adequate for a small booth. For shellac pressings, a so-called extended range high fidelity speaker should *not* be used, as the high frequency distortion inherent in the records plus the scratch level will not be pleasing.

This is not true of a good home recording, or of the new, unbreakable plastic records which are becoming available. As a matter of fact, perhaps it would be wise to provide a wider range amplifier system to play these new records, to demonstrate to the public their virtues and to justify their higher cost. After all, John Q. Public will think twice before putting out two dollars for one record. A sign in your booth, stating that the pickup being used is one with a permanent needle, puts very low pressure on the record and does not "chatter", and that such pickups are for sale and can be put on customers' phonographs, provides inexpensive advertising that will increase sales and lucrative jobs for the

Figure 3 (continued): ***Left,*** **working drawing of speaker assembly with baffle for 8-inch speaker, to reproduce range of most records at most comfortable listening level for close booth quarters.** ***Right,*** **separately mounted speaker, in booth with finish insulation of acoustic wall board.**





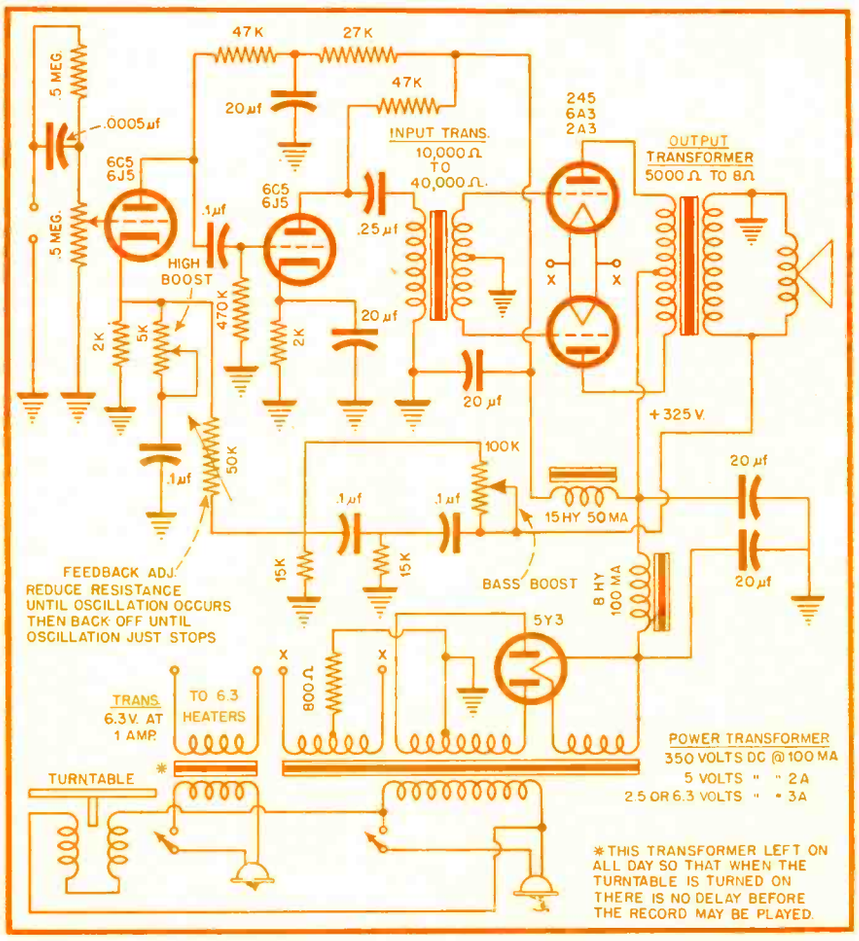
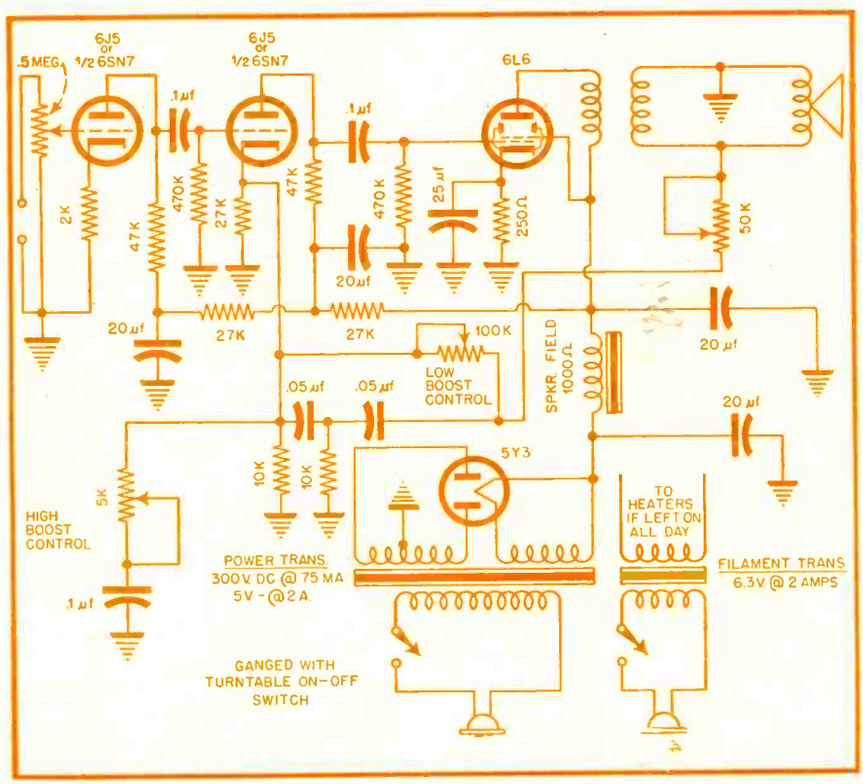


Figure 1 (above): Schematic for amplifier with push-pull output, separate bass and treble controls; sufficient negative feedback to reduce distortion and hum. Figure 2: Smaller, single-sided amplifier, with high and low frequency tone controls, negative feedback, power for small booth.



could, of course, be applied, no matter what new features pickups may have.

The public must be educated to appreciate *and want* higher fidelity phonographs, radios and records. The ideal place is in a record booth, and certainly the customer will place more confidence in the evidence of his own ears than in even the most polished sales talk.

Figure 3 is a layout drawing of a sample record booth. It is not a specific design, but rather something to stimulate your thought along lines which would be suitable for your own establishment.

DEALERS MERCHANDISE DISCS

Remodels

Matching their up-to-the-minute merchandising techniques, Barnard's RCA Victor dealer in Kansas City, Missouri, renovated their shop recently. The store is set up with self-selection merchandising fixtures throughout, with space provided for feature selections between the dozen listening booths. Booths are pastel colors with matching leather furnishings. Two oversized booths are reserved for classical record listening. An innovation of the new shop is a taller than usual sales and wrapping counter, carpeted to reduce wear on salesgirls and records. Special display space for featured merchandise is provided in a behind-the-counter shelf. Working stock of both albums and records and surplus stocks are in a hidden alcove behind the sales counter. One of the basement rooms was converted into a rumpus-listening room for high-schoolers to eliminate a teen-age noise problem.

The store is wired for indirect lighting. All fixtures are a honey colored plywood in contrast to brown tile floor. Manager Virginia Pierce states that sales have hit a new high since remodeling and that sales of classical merchandise exceed popular record turnover.

Larger Quarters

The C. J. Heppe Company of Philadelphia, dealers since 1865, recently expanded into capacious quarters formerly occupied by the City National Bank.

Self-selection merchandising fix-

[*see page* 60]

HIGH STYLE SELLERS

THE new Zenith radio-phonographs feature the "new way to play records", new table models, new portables—with new designs, new electrical circuits and new mechanical features. They were on view to dealers attending the Furniture Mart in Chicago last month. The sets included the 26 advance models of the Zenith Radio Corp.'s new 30th Anniversary Line, complete with 40 OPA approved list prices from $19.95, for a five tube table model, through $295, for an authentic period model combination.

Of special interest were the following: The free-floating Cobra Tone Arm that can be dropped on or scraped across records without damage to either the tone arm or the records. The new Silent-Speed record changer plays mixed records in a fast change cycle of 3½ seconds. Also a remote control feature that makes it possible to start the records to playing or to change them at any point during the playing with the touch of a button on the radio control panel.

The portable models include the Transoceanic standard and short wave portable, featuring detachable Wavemagnets, and a pop-up Waverod, push-pull amplification, Radiorgan tone control and push button band selection with spread band tuning. Second is a newcomer, the "Global" portable with Wavemagnets, Waverod, and two short wave bands, among many other features. The new "Universal" with its phantom dial also has the detachable Wavemagnet and a host of features.

Service policies are indicated by Frank Smolek, manager of the service department, who points out the necessity of high service standards for the maintenance of good will. He announces new service schools Zenith will conduct for dealers and distributors.

R. F. Miller, manager of parts and battery sales, tells of Zenith's growth in those important phases despite wartime shortages. He prophesies a growing importance of battery business in conjunction with portable sales, as well as the increase in rural market requirements.

Left (from top): **6D014W, 5 tubes plus rectifier tube; 3-gang condenser, Alnico speaker; tuned radio frequencl.**

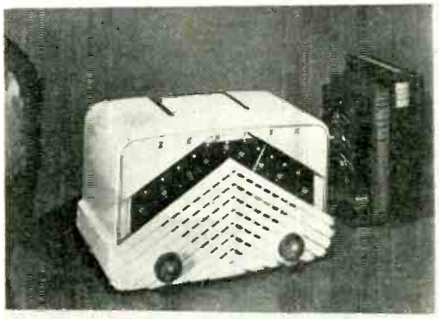
6G001Y, same specifications, operates on battery in addition to AC-DC; detachable Wavemagnet; luggage style case.

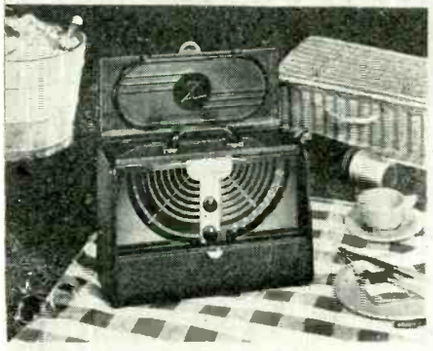
6D015W, same specifications, table model, but no battery; case has fold-away carrying handle. 5R086R, 4 tubes plus power rectifier tube; automatic radio-phonograph; crystal pick-up, long-life needle.

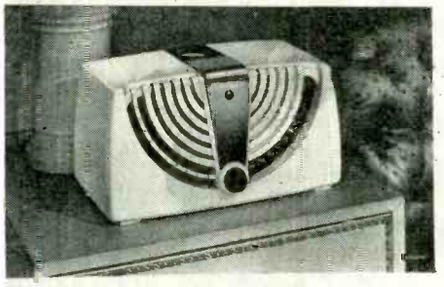
Right (from top): **12H092R console; 9 tubes plus rectifier tube plus 3-purpose phono tube plus cathode ray indicator tube. Cobra tone arm; 14-inch Concert Grand speaker; 3-gang condenser and tuned radio frequency; rotor Wave-magnet, built-in FM antenna. Silent-Speed intermix record changer. 18th Century cabinet, mahogany with swirl front.**

12H094E console; same specifications as above; cabinet in Modern, bisque on bleached mahogany.

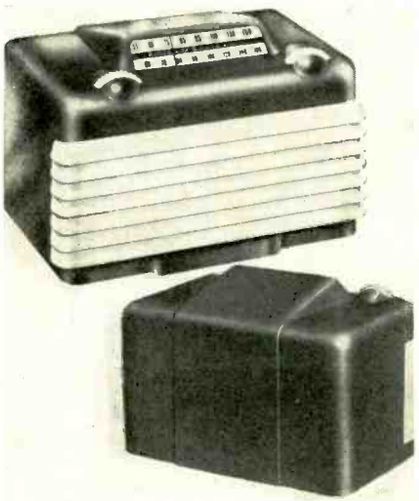
12H090 console; same specifications. Conventional design cabinet, walnut finish.







NEW PRODUCTS radios and

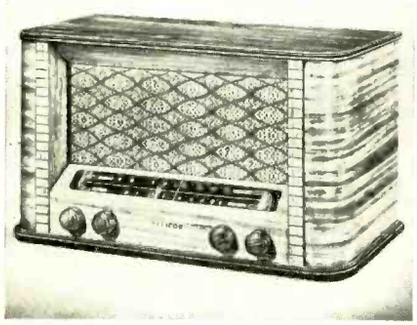


Setchell-Carlson

Five tube Table Model 416. 5-inch P.M. dynamic speaker. Back is completely enclosed. Plastic case in walnut, black, maroon, blue and ivory combinations. Aluminum chassis can be removed complete with controls, dial and speaker, can be removed and replaced in a matter of seconds. By inverting the radio all tubes are exposed for checking and replacement without removing chassis. Superhet circuit, AC-DC, automatic volume control, built-in loop antenna. Setchell-Carlson, Inc., 2233 University Ave., St. Paul 4, Minn.

Emerson

Recently approved by OPA, new Emerson model 504, AC-DC compact. Waterfall construction combines with clear plastic grille over colored backplate. Also available in mahogany. Price $34. Emerson Radio & Phonograph Corp., 111 8th Ave., New York 11, N. Y.



Telicon

Model 12R; 7-tube superhet., 8-inch P.M. speaker. Broadcast and shortwave bands; variable tone control. Full-vision slide rule dial. Phono input jack; loop operation for broadcast range. Push-pull audio system, AC-DC operation. Telicon Corp., 851 Madison Avenue, New York, N. Y.

Philco

Hepplewhite, Model 1214, custom built. Advanced FM system. 14 tubes, including rectifier. High fidelity tone control; two dynamic speakers; dynamic reproducer. DeLuxe record changer; no needles to change. Push-button motor tuning for FM and AM. Standard broadcasts, FM stations, day and night American and foreign shortwave, police, amateurs. Choice of walnut or mahogany. Philco Corp., Tioga and C Streets, Philadelphia 34, Pa.

Telicon

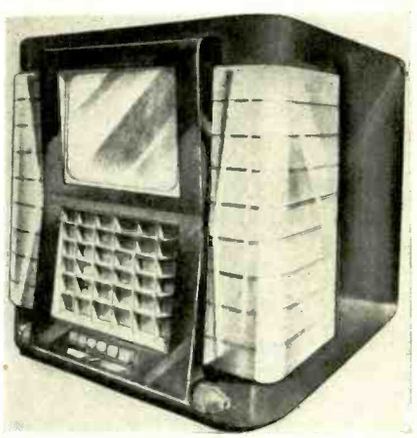
Model 22 APR automatic phono-radio console. 7-tube superhet., 8-inch P.M. speaker, 7-oz. slug. Broadcast and shortwave bands. Variable tone control. Loop operation for broadcast range. Push pull audio system, AC. Automatic record changer, with ample record storage space. In mahogany veneers. Telicon Corp., 851 Madison Avenue, New York, N. Y.

Teletone

Model #120, 6-tube superhet. AC-DC. Radioptikon, enclosed antenna. Illuminated full vision slide-rule dial. Tutone plastic cabinet. Teletone Radio Corp., 609 W. 51 St., New York, N. Y.

Howard

Model 901-W, table model; 5 tubes (one double duty for 6 tube performance); superhet. circuit, built-in low loss loop antenna, with connection for weak signal areas; no ground needed. Floating 2-gang condenser; full-vision dial. 5-inch dynamic speaker; beam power output. Cabinet of thermo-set walnut plywood, beverage proof finish. Full back cover. Tuning range 540-1700 KC, full broadcast and some police signals; 110-125 volts AC-DC. Howard Radio Co., 1735 Belmont Ave., Chicago 13, Ill.



Stromberg-Carlson

Artist's conception, a top notch designer, of how a table model of the home television receiver of the future may look. Intensive study of design trends is being undertaken by the company in the sight-and-sound medium. Stromberg-Carlson, Rochester, N. Y.

Philco

Chippendale, Model 1217, custom built — advanced FM system; 14 tubes, including rectifier. High fidelity tone control, 3 balanced dynamic speakers, dynamic reproducer. DeLuxe record changer, featherweight tone arm with permanent jewel. Push-button motor tuning for FM and AM standard broadcasts, short-wave, state police, amateurs. Philco Corp., Tioga & C Street, Phila. 34, Pa.

appliances

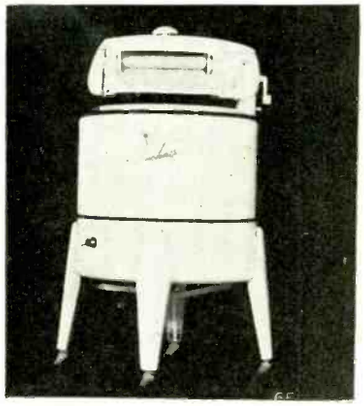
NEW PRODUCTS

Admiral

Electric range, with full array of automatic and self-regulating features, is examined by S. Mintz, director of advertising, getting pointers from Harold D. Conklin, manager of Appliance Division. Full description of range will be available soon. Admiral Corp., 3800 Cortland St., Chicago, Ill.

Emerson

Model 503, table model, AC-DC. Overall perfo-grille. Enclosed "super loop", heavy voice coil and boom capacity speaker provide "Miracle Tone". OPA approved price, $32. Emerson Radio & Phonograph Corp., 111 8th Ave., New York 11, N. Y.

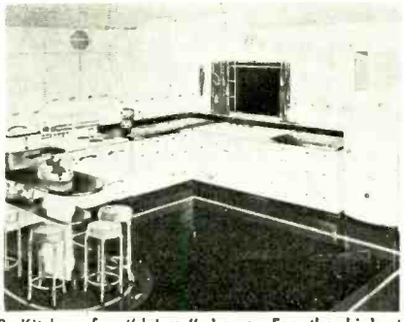


Appliance Mfg. Co.

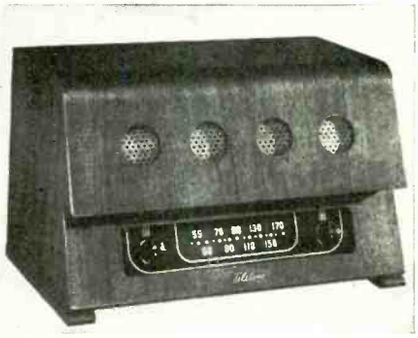
Duchess, Model 6H Washer with wringer. $69.95 in Zone 1. White porcelain enamel tub, 8-lb dry clothes capacity. Drain valve threaded for standard hose connection. Pressed steel legs, secured with tongues and bolts, removable, interchangeable. Outside control clutch; molded plastic agitator with three high spiral vanes. Wringer with push bar release, self-reversing drain pan. Vibration proof ¼ h.p. motor made by General Motors. Comes equipped with gasoline motor. Only electric models have drain pump. Appliance Mfg. Co., Alliance, Ohio.

Westinghouse

1. Kitchen for "budget" class homes: fixed electrical equipment includes an electric range, refrigerator, dishwasher, ventilating fan and clock.



3. Kitchen for "deluxe" home: For the highest of four classifications of electrical living, kitchen also has decorative lighting in addition to full complement of major appliances, all fixtures being deluxe.

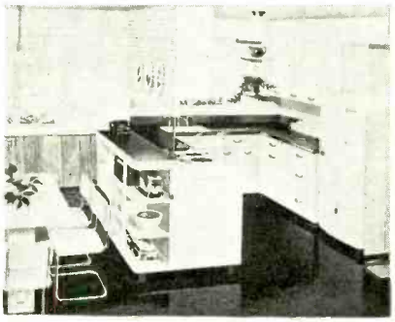


Teletone

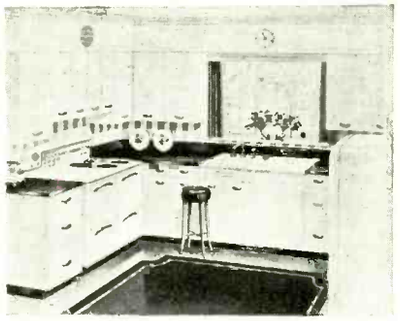
Model 160, 6-tube superhet. AC-DC. Radioptikon. Harmanique Tone Chamber and base. Alnico 5-inch speaker. Illuminated slide rule dial. Walnut veneer cabinet. Teletone Radio Corp. 609 W. 51 St., New York, N. Y.

Hill-Shaw

Valculator DeLuxe, two-heat hot plate, for use with glass coffee makers. Chrome-plated shell on block plastic base, scratch protected. 2-heat switch — one for brewing, the other for keeping coffee warm. 115-volts AC-DC; 550 watts on "brew" and 65 watts on "warm". Underwriters approved cord set included. Dealer price, including Federal tax, $5.25. Hill-Shaw Co., Chicago 6, Ill.



2. Kitchen for "thrift" home. "U" type kitchen is efficient because counter surface is continuous. Contains only an electric range, refrigerator, ventilating fan and clock as fixed electrical equipment, but has plenty of convenience outlets for portable appliances as they are bought.



4. Kitchen for "ideal" home: This plan provides an electric range, refrigerator, dishwasher, garbage disposal unit, ventilating fan and clock as fixed equipment.

Howard

Model 902-W, table model. Same specifications as Model 901-W. Top sides and frame finished in rich walnut, front panel in blond mahogany with dark louvres in speaker grill. Tuning bands include 6-18 megacycles (49-16 metres). Receives full broadcast band, some police signals and American and foreign shortwaves. 110-115 volts, AC-DC. Howard Radio Co., 1735 Belmont Ave., Chicago 13, Ill.

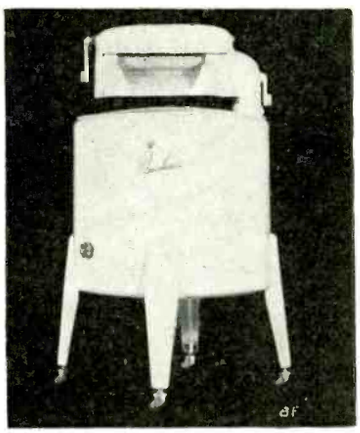
Electronic Laboratories

DDealers and jobbers have been given the above colorful counter display for E-L auto radio replacement vibrators. Reproduced in green, yellow and black, the display mounts Models 1703 and 2041 vibrators, typical of the line. Electronic Laboratories, Inc., Indianapolis, Ind.

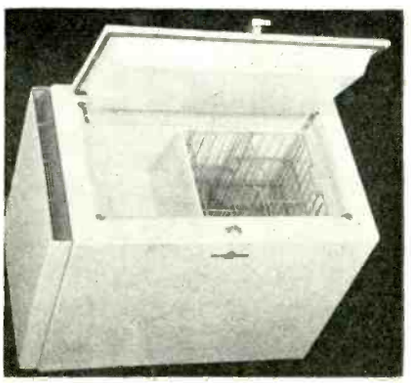
NEW PRODUCTS

[from page 31]

Simplon
Model WVV2, 5-tube AC-DC table model. Five "Loctal" tubes — 14Q7, 14A7, 14B6, 50A5, 35Y4. Walnut wood cabinet; full-vision slide rule tuning scale; automatic volume control. Built-in loop antenna; 5-inch speaker, "Alnico" V magnet; superhet. circuit, one band. Industrial Electronics Corp., 505 Court St., Brooklyn, N. Y.



Appliance Mfg.
Model 8H, Duchess washer with wringer. $89.95 in Zone 1. Double wall tub with air space retaining heat; keeps water hot longer. White porcelain, capacity 8 pounds dry clothes. Extra heavy legs and caster, detachable, 19 gauge. "Clothes Saver" wringer, pressure control and pressure indicator. Rubber mounted 1/4-h.p. Sunlight motor (General Motors). Optianal equipment, gasoline motor; motor driven drain pump on electric models. Appliance Manufacturing Co., Alliance, Ohio.



Coolerator
Home Freezer, Model F65. Overall size, 37 inches high; 47 inches long; 28 inches wide. Freezing compartment 10 x 14 x 17 (approx.) inches; storage compartment, approx, 25 x 19 x 17 inches; total volume 6.58 cu. ft. Freezing compartment, 1.53 cu. ft.; storage compartment, 5.05 cu. ft. Insulation walls, 5 inches; lid, 4 inches. Storage and freezing compartment temperatures, zero deg. F. plus or minus 5 deg. Tecumseh compressor, 1/6 h.p. motor; weight 425 crated. The Coolerator Co., Duluth 1, Minn.

Hoffman
Table Model A-300 (Monterey) in choice of walnut, mahogany or blond wood finishes. 6-tube chassis, AC superhet circuit, automatic volume control, variable tone control, 6-inch oval electrodynamic speaker. Built-in loop antenna. Dial is slide rule type with bevel edge lighting, color toned. Hoffman Radio Corp., Los Angeles, Calif.

SEES EXPANDED RECORD SALES

DISCS for recordings in homes, schools and other institutions are expected to develop a substantial industry within the next few years, according to William C. Speed, president of Audio Devices, Inc., New York City, manufacturers of instantaneous recording discs used in radio program transcriptions and Master phonograph recordings. Mr. Speed said that with the marked improvement in supplies of raw materials, release of the pent-up demand for recording in homes and schools should lift the industry into one of the major branches of the electrical field.

Popularity Growing

At the time World War II broke out, Mr. Speed reported, the idea of home transcriptions of broadcasts and home recording of party entertainment features was rapidly growing in popularity. During the war, the use of recording materials was largely confined to essential purposes. "A sizeable part of our company's output went and still goes to the Armed Forces Radio Service for transcriptions in rebroadcasts to War Theatres as well as to other government agencies.

"With the domestic situation improving, we look for a great expansion of recording in the entertainment and educational fields. The phonograph record industry anticipates this year will be the biggest in its long history, with possible production of more than a half billion classical and popular records.

In discussing the status of present-day recording methods, Mr. Speed, who presented historical highlights of various stages of progress in recording history from 1890 to the present day, demonstrated that disc recording has now reached a state of perfection undreamed of when Thomas A. Edison recorded his own voice in a recitation of "Mary Had a Little Lamb". Because of the fact that the disc method now permits recording and reproduction of almost the complete tonal range audible to the human ear, it now surpasses any other form of recording, he asserted. "While technological advances are necessary before this perfection of Master recordings may be fully reflected in records played on the home phonograph, we are happy to say that these improvements are now under way," he added.

The millions of phonographs now in America's homes will never be obsoleted by wire or tape recordings, he declared. Although both latter forms of recording have interesting application possibilities, they operate under the inherent handicap of being unsuited to easy playback of individual sections, as are disc recordings. In other words, he explained, when one wishes to hear just a part of a wire or a tape recording, he may have to play a long passage preceding the desired portion. To repeat, he must rewind the entire recording — an operation that may take almost as long as the playing.

William C. Speed, president Audio Devices (right), shows editor Lew Stone the characteristics of sound grooves on Audiodisc, thru pocket magnifier.

De Luxe SELLERS

The first demonstration of the new Scott Radio was held recently in the offices of Hal S. Darr, president of Scott Radio Laboratories, Inc., 111 West Monroe St., Chicago.

Seven control dials enable the user of the set to obtain tuning of unusual fidelity, and tone which may be easily adapted to the listener's personal taste. The dial rests inside the cabinet when not in use, and rides out on a roller track for easy accessibility when needed. It is designed by Walter Darwin Teague, prominent New York industrial designer.

The set, which has 24 tubes, covers the full AM broadcast band; the new FM band of 88 to 108 megacycles, and the bands on which the principal short-wave stations of the world operate. A phonograph with automatic record-changer is included.

The company, which previously distributed its sets only through salons situated in New York, Chicago, and Los Angeles, has selected more than one hundred leading department stores and music and radio dealers who will merchandise, install and service Scott instruments. In each case, suitable arrangements have been made so that the radios may be listened to in quiet, pleasant surroundings that will give the prospective buyer a real chance to judge the true value of the set.

Further, in order to provide necessary service, Scott has arranged to have specially trained men available in every locality in which the sets are sold. Thus, every Scott owner is assured of service which is as highly developed as the radio itself.

Ernest J. Halter, vice-president in charge of sales of the company, said the company was in production on its middle-price line with an OPA price on one model of $937.50. The price of the low cost models will start at approximately $500.00; the top line will start at $1300.00.

Top: "Cheesecake" shot shows Scott chassis "with its Nylons on", but no case. Roped in like new auto jobs at showtime the stripped receiver attracted crowds, worked demonstrators overtime. (As seen at Haynes-Griffin, New York dealers). Fully dressed set is blond mahogany Modern. 24 tubes cover FM new band 88-108 mc.—full broadcast AM, plus 19, 31, 25 & 49 meter bands taking principal short-waves.

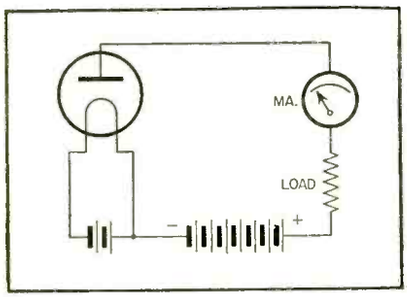


Figure 1.

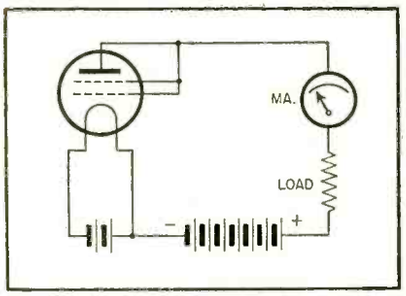


Figure 2.

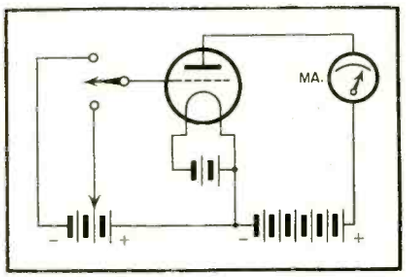


Figure 3.

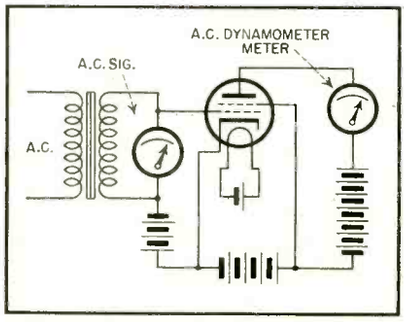
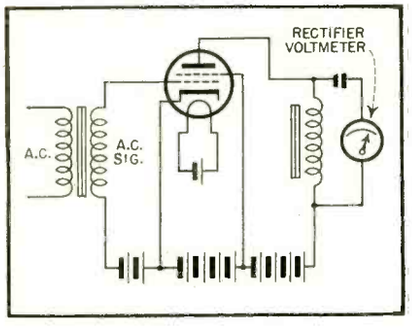


Figure 4.

Figure 5.



MODERN TUBE TESTING

PART ONE OF A SERIES

A GREAT many receivers become inoperative due to tube failure and therefore the first step in repairing any piece of electronic equipment is to test the tubes. Most servicemen follow this practice but many don't realize that after tests have been made they may still have a bad tube in operation. When such a situation is discovered the serviceman immediately blames his tube tester, thinking he is the only person in the world with such trouble.

Most tubes fail because they just naturally wear out. That is, the filament or cathode ceases emitting the necessary quantity of electrons and the emission of the tube drops. Other tubes develop special internal mechanical or electrical faults showing poor results in various other ways.

Without a doubt the only positive way to locate a bad tube is by substitution but such a practice is now difficult due to the hundreds of different tube types now encountered. Furthermore the substitution method is impractical for the tube dealer who seldom sees the receiver in which the tubes are used.

Another system, which at first glance seems good for the serviceman, is the substitution method coupled with gain per stage measurements. This plan runs into a snag in RF amplifiers using AVC. When a new tube or weak tube is inserted in such circuits the AVC contributes a leveling action which tends to equalize the gain regardless of the tube used and makes it difficult to arrive at any positive conclusions and hundreds of different tube types would still be needed for substitution.

The most logical method for tube testings seems the use of a good commercial tube tester to cull out the obviously bad tubes resorting to substitution methods when the queer cases crop up.

That brings up the question "why don't the commercial tube testers find all of the bad tubes?" The best way to answer that is to find out what goes wrong with tubes and how each fault can be detected. As previously mentioned the most common tube fault is poor emission, therefore an emission tester would probably do a job and is a rather simple device to produce.

Emission Values

With normal voltage applied to the filament a positively charged plate will theoretically receive all electrons emitted. By measuring the plate current, with a suitable load applied to the tube, a direct indication of the electron flow or emission is obtained. (*Fig. 1.*)

When grids of various types are inserted between the plate and filament each interrupts a portion of the electron flow. Therefore, by the simple process of tying all grids to the plate, in multi-element tubes and measuring the total current, a direct indication of the total emission is obtained. (*Fig. 2.*) Various applications of this basic circuit are used in a number of commercial testers to be described in detail in the next article.

Unfortunately no standards were set on emission values. No one knows

what 100 per cent emission may be; therefore the manufacturer of an emission tester requires considerable experience. Rejection points must be set entirely on the basis of many tests on all kinds of good and bad tubes. Since an emission tube tester does not measure a standardized tube characteristic, it would seem more desirable to design a tube tester around some other measurable, listed value. Reference to a tube specification sheet will show that, aside from the rated operating voltages and currents, the following values are given: Plate Resistance, Amplification Factor, Mutual Conductance and, for oscillator-mixer tubes, Translation Conductance.

The measurement of plate resistance is not indicative of tube quality and, along with amplification factor, involves a complicated process usually confined to laboratory procedure. Mutual conductance seems to be a logical quantity to measure but does involve many complications not encountered in emission measurements.

Mutual Conductance

There are two basic methods for measuring mutual conductance. First the static or grid shift method. By definition, Mutual Conductance is the ratio of plate current change to grid volatge change:

$$\frac{IP1 - IP2}{EG2 - EG1} \times 1000$$

Where IP1 is the initial Plate current with a grid potential of EG1 and IP2 is the resulting Plate current when the grid potential is changed to EG2. For example with a 5 volt bias the plate current of 6 ma.; with a 10 volt bias the plate current measures 3 ma.: then the mutual conductance is:

$$\frac{6 - 3}{10 - 5} \times 1000$$

A basic grid shift tube tester is shown in *Fig. 3.*

The second method is known as Dynamic Mutual Conductance testing. This is a term which has been badly misused lately. The term "dynamic" alone does not necessarily mean the measurement of the basic mutual conductance value. Most commercial designs result in a measurement which is proportional to mutual conductance, not the absolute value. Dynamic Mutual Conductance measurements require the measurement of the AC component in the plate circuit at zero load with the application of a measured AC signal at the grid with the tube operating under normal rated conditions. (*Fig. 4.*) In a later article commercial methods of making this measurement and modifications thereof will be described.

Referring to the tube manual will reveal that many tubes have two and some times three recommended operating conditions and for each condition a different mutual conductance value is given. Thus a true dynamic mutual conductance test requires that specific operating voltages be used in order to arrive at the correct mutual conductance reading.

Output tests are also of considerable value in determining tube quality. To make such tests the tube is set up with its proper operating values, an AC signal is applied to the grid and measured in the plate circuit across the proper tube plate load resistance. The final results of such tests are good indications of the Amplification factor of the tube as well as the power handling ability but the design of a suitable tester is very complex. (*Fig. 5.*) In addition to the previously mentioned important tests other special tests must be considered.

Short tests and cathode leakage measurements are quite necessary but most manufacturers are now providing neon lamp indications which are in most cases adequate (*Fig. 6.*) The principal problem connected with short testing is that of applying the test to all elements regardless of the pin location on the tube base.

Gas measurements are not too important except in connection with beam power tubes which seem to be bothered considerably with internal indigestion. This is aggravated by the fact that high resistance grid resistors are used in most of the midget receivers. With a 1 megohm grid resistor 10 microamperes of grid current due

[*see page* 69]

Figure 6.

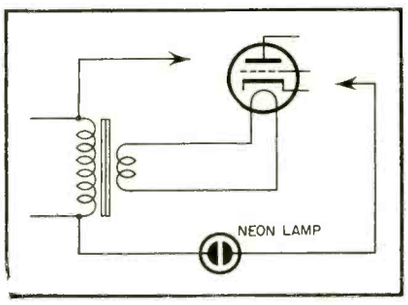


Figure 7.

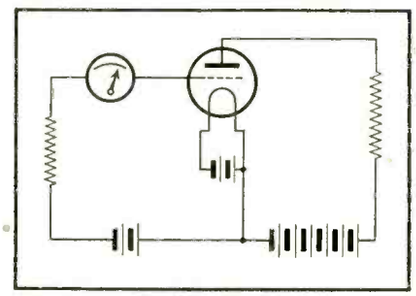
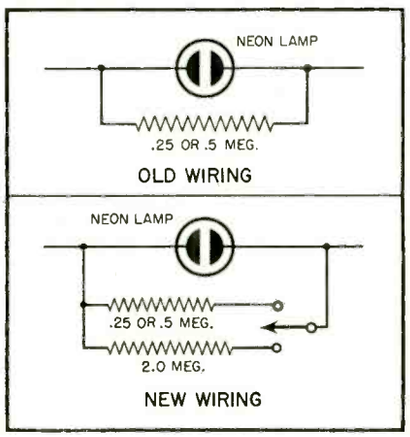
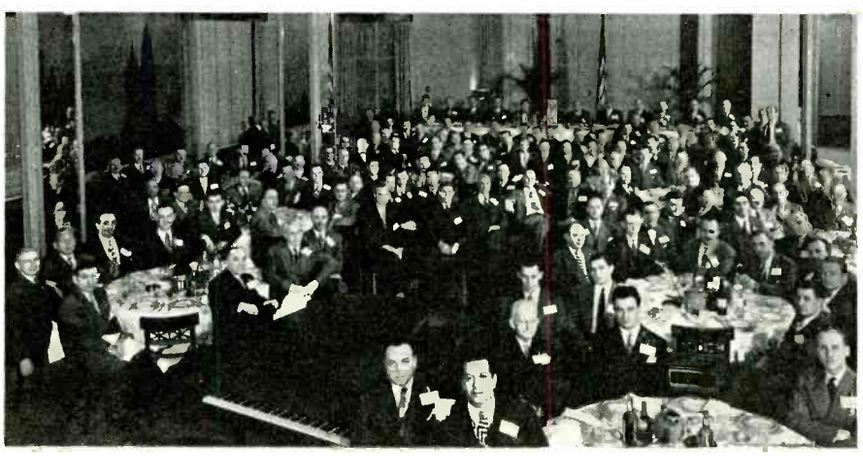


Figure 8.





The Representatives, New York Chapter, played host to manufacturers and jobbers at a well-attended dinner-business meeting in the Hotel New Yorker April 11th. Officers are: Lee Freed, president; Sam Egert, vice-president: William Gold, secretary-treasurer.

SERVICING SOUND SYSTEMS

by **CHARLES E. SOMMER**
International Resistance Company

Ins-and-outs of installation, servicing and maintenance of public-address systems. Specialized market opportunity for service dealers during slack months of the year.

THE majority of radio dealers and radio servicemen find that there are periodic slack seasons occurring during their normal business year. It is during these periods of reduced business that many radio dealers are earning a profitable income by the maintenance and servicing of sound systems and equipment. Most dealers know where sound equipment is used, such as in churches, schools, industrial plants, large offices, hospitals, stores, etc. Consequently, when contacted, the majority of these outlets welcome the opportunity of knowing a competent and reputable organization to handle their complaints. In most major cities of this country there is a dearth of men who have proper equipment and the technical knowledge to adequately service modern sound equipment.

It cannot be stressed too much that proper equipment is necessary to service satisfactorily and quickly the average sound system. Dealers have found that ample modern test equipment saves time and money in their service shops. It has been found by the writer that a good voltohmeter with accurate low resistance scale, with provision for measuring output voltage, is of prime importance. Naturally, a calibrated and variable audio signal generator plus a frequency record are essential also. These items plus the normal complement of tools that most radio dealers have, equip the serviceman for "sound" business.

FIELD TROUBLES ON AMPLIFIERS

1. Phase inversion circuits.

The majority of modern, compact, and light weight amplifiers employ resistance coupled stages with usually a phase inversion network when push pull tubes are employed in the output. One of the most common faults in circuits of this type is resistor failure. By this it is not meant that resistors open up, although this sometimes does happen. Invariably, resistors go out of tolerance or off value with use. This is most generally the case when a loss of power is noticed or when hum is present with filter condensers good.

Any unbalancing of resistors in the plate and grid circuits will cause conditions such as this. A good indication of this unbalanced condition will be noticed if one output tube is removed, then noting quality and volume level. Replace tube and do likewise with the other output tube. Compare audible start checking resistance values of resistors according to R.M.A. code. Always use resistors with 5% tolerance when replacing in balanced circuits.

This so-called unbalanced condition can also be caused by mismatched output tubes particularly where beam power tubes are used. Of course most good radio men almost always follow a procedure of checking radio tubes before they commence working on equipment. Both tubes should give you approximately the same reading on the tube checker. To further prove that under operating conditions tubes are functioning properly, it is not a difficult job to insert a milliammeter in the plate circuit and in the screen circuit. The readings that are obtained

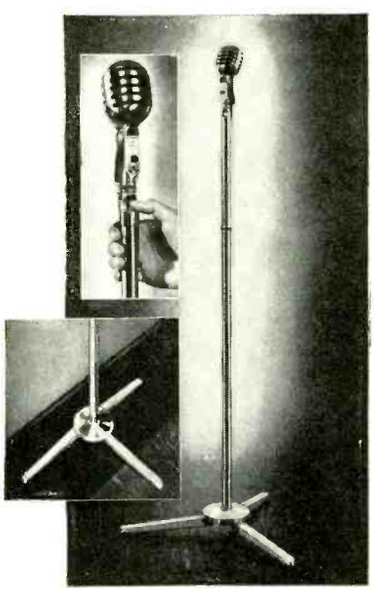
Ralph Walker and Arch Samuelson inspect the Operadio "Plant-Broadcaster" installation which provides music, work-paging and personnel announcements through 131 loudspeakers in the Johnson & Johnson plant in Chicago.

should compare very favorably when checking push pull output tubes.

2. Class A.

Most technical men favor the Class A type of amplifier. The reason for this is because in the majority of cases we have much better fidelity, and in a well designed system, a minimum of distortion. Originally, in the early days of radio, the Class A type of amplifier was most commonly used. With later developments in radio and electronics, improvements have been made and we now have also Class AB_1 and AB_2. Their main difference is in the method of biasing, with which many radio men are rather familiar. However, in these three types of circuits the bias resistor plays a very important part. Lack of proper bias can cause a multitude of ills in sound systems.

Many times too little emphasis is placed upon the proper power rating of the resistor which is used. This results often in overloading the bias resistor causing it to burn out, in which case the grids of the output tubes glow red with tremendous reduction in power output of the amplifier. Then, too, overloading of the bias resistor causes it to heat up beyond its normal operating temperature and in the case of the carbon resistor the ultimate life is not very long. In a wire wound resistor, an overload condition will tend to heat the wire beyond its normal operating range and as a result, the resistance value will change causing improper bias to be placed on the tubes. Distortion results and the life of the tubes is naturally reduced. The various ills expressed in the three Class A types of amplifiers are not very numerous although at times we do have transformer failures, from insulation breaking down, in which case we get a crackling or a certain amount of "hash" due to layers of the winding shorting out. A condition of this type eventually causes the winding to burn out with the consequent loss of operation. Troubles of this sort are generally easily found and therefore it won't be necessary to go into further detail.



Electro-Voice Model 425 Microphone floor stand for in-plant studio use

3. Class B.

Class B types of amplifiers are not very common in the majority of sound systems in the field today. The above types are far more well known. The Class B Amplifier is actually an outgrowth of our Class A types. Again the prime difference is in the method of biasing in that the plate current is cut off for a greater portion of the negative grid swing. Lack of proper operating efficiency can be many times traced to improper grid bias. During the operation of a Class B Amplifier a tremendous amount of grid current is flowing. That is why it is essential to have excellent voltage regulation in the power supply. Filter condensers which develop leakage will many times not only cause hum to be noticed, but will also impose an added drain on the power supply lowering the overall voltage and reducing efficient regulation. It is always wise to check filter condensers first to ascertain if any leakage is noticeable. Any high range ohmmeter will facilitate testing or else a high range milliammeter may be inserted in series with filter condensers in question.

A multi-unit Operadio exponential horn provides high volume to overcome extreme extraneous ground noise

Any of the above items mentioned under 1 and 2 are applicable to Class B circuits.

A Bell Sound installation in a studio calls participants to attention

FIELD TROUBLES ON MICROPHONES AND PHONOGRAPH PICKUPS

1. Microphones.

The microphones used in sound equipment in the order of their popularity are crystal, velocity and dynamic. The first is used on the most amplifiers because of its high gain, its sensitive pickup and its price economy. The velocity type requires more amplification but generally reproduces with a higher degree of fidelity, at the same time being very directional. The original cost of most velocity microphones prohibits their use on the lower priced sound systems. The dynamic type of microphone is not widely used in the field. However, adaptations of the principle of the dynamic microphone are used in many interoffice communication systems.

Troubles on all types of microphones can generally be traced to rough handling and faulty wiring, either entering directly into the microphone or via a plug. Through constant use or misuse, either strands of the main wire are broken partially or entirely or poor ground connections exist in the shielding. Most microphones have a definite life span depending upon their use and handling rather than on their age. It is many times difficult to determine whether a microphone is operating at peak efficiency or not. Often it is advisable to substitute a "known good" microphone in place of the doubtful one. It is not general practice for repairs of a major nature to be made on any microphone. It is best to return it to the manufacturer for servicing or replace with a new one.

2. Phonograph Pickups.

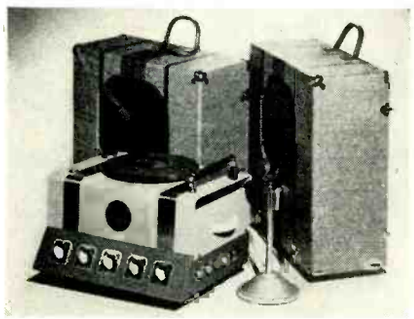
The most commonly used phonograph pickup in the field today is the

crystal type. However, there are many of the magnetic types still in use. The advantages of the crystal pickup are that it reproduces with a high degree of fidelity, at the same time having a rather high output. The crystal types are both reasonable in cost and light in weight with correspondingly lower wear on record surfaces. The field life of most crystal types is approximately four years, depending upon use and handling. After this length of time, it will be found that the reproduction, while still good, does not cover the entire musical range. This is mostly noticed on the higher frequencies. Many manufacturers have released curves on the fidelity of their pickups. When in doubt as to the efficient operation of a pickup, it is a good idea to make sure you have a good needle and to use a frequency record. By coupling an output meter across the output of the amplifier, a satisfactory curve can be drawn. This will be indicative of the performance of the pickup. When a crystal pickup fails to perform satisfactorily, it is quite a simple job to replace the crystal cartridge with a new one.

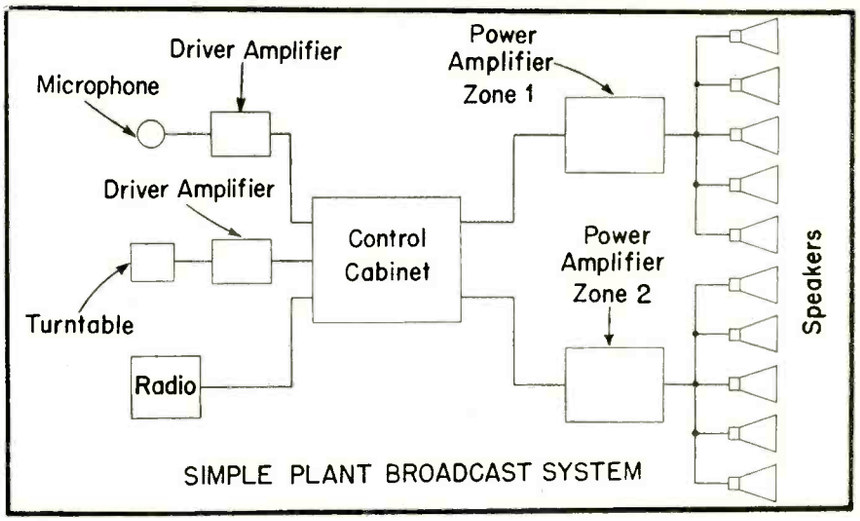
Magnetic pickups present in the field today fall in two categories. One, the old-time rubber or viscoloy damped; and second, the modern high fidelity types. In the former, the reproduction or fidelity is rather poor in comparison to the crystal type. This condition can be improved many times by replacing the damping spacers. However, this is a rather delicate job and many servicemen do not like to attempt it. The modern type of magnetic pickup presents very few service problems unless it is carelessly handled.

MODERNIZING OLD EQUIPMENT

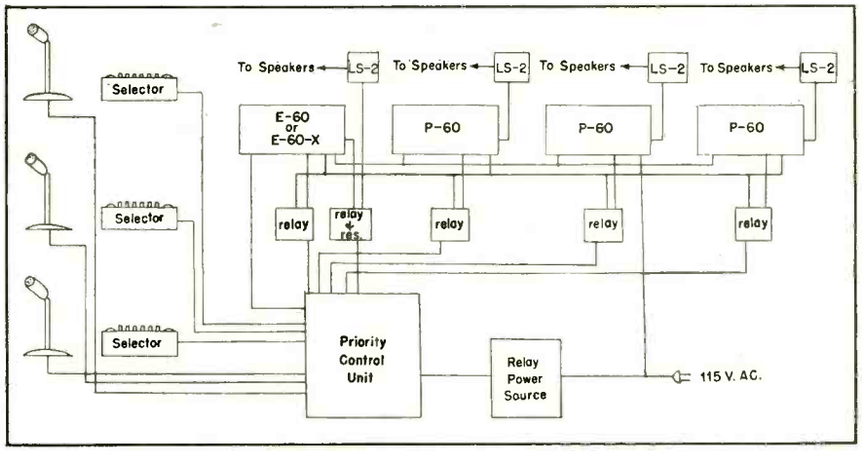
In many applications today it is necessary either through the age of some of the equipment or else through expansion to replace part of the equipment. In the case of age, many times a good basic amplifier will sound far better with the addition of a new microphone or phonograph pickup.



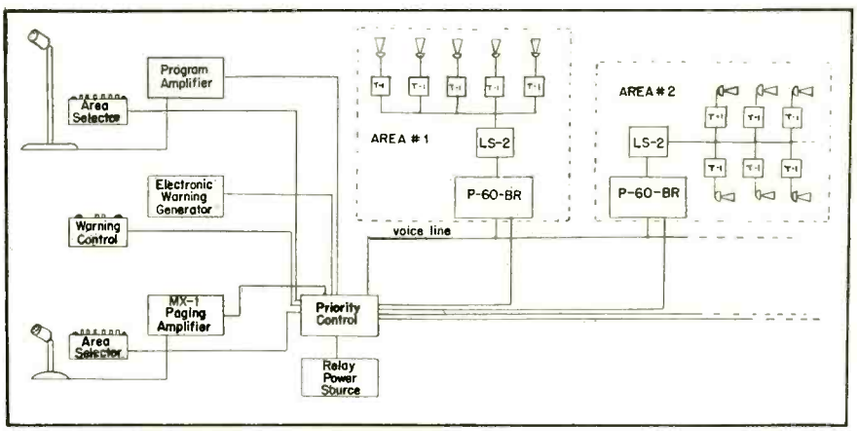
A new Meck portable p-a system.



Basic internal broadcast system; equipped for music, paging, radio reception.



Above: System with more than one control point; priority control unit gives selective programming. Warning lights aid operation. Below: Similar system, but amplifiers more widely distributed. Equipment shown includes program input, area selector, special alarm, paging input. Relays generally operate D.C., preferably telephone type. ***(Code letters and figures are for items in Newcomb Audio Products line).***



Then, too, replacing old speakers with the newer and more high fidelity permanent magnetic speakers will generally improve an installation considerably. Just what has to be replaced will depend upon the type of installation and the condition of the component parts. Careful inspection of the entire installation will usually show up defective items. The serviceman is then in an excellent position to make recommendations and arrange for the sale and installation of the new equipment.

In the case of expansion, unless the present amplifier has quite a reserve of undistorted power output, it will be found necessary to replace the amplifier. Be sure to figure, in watts, the total audio power that will be required on the entire installation. To do this, it is necessary to estimate what audio power will be required in each speaker location. Then multiply the amount of speakers by the amount of audio power required and you have a fairly good approximation of what you will need in an amplifier. In most all cases today, permanent magnet speakers are utilized in conjunction with a 500-ohm line. By so doing, we reduce the necessity of using separate field supplies and associated wiring.

PROPER INSTALLATIONS FOR PORTABLE SOUND EQUIPMENT

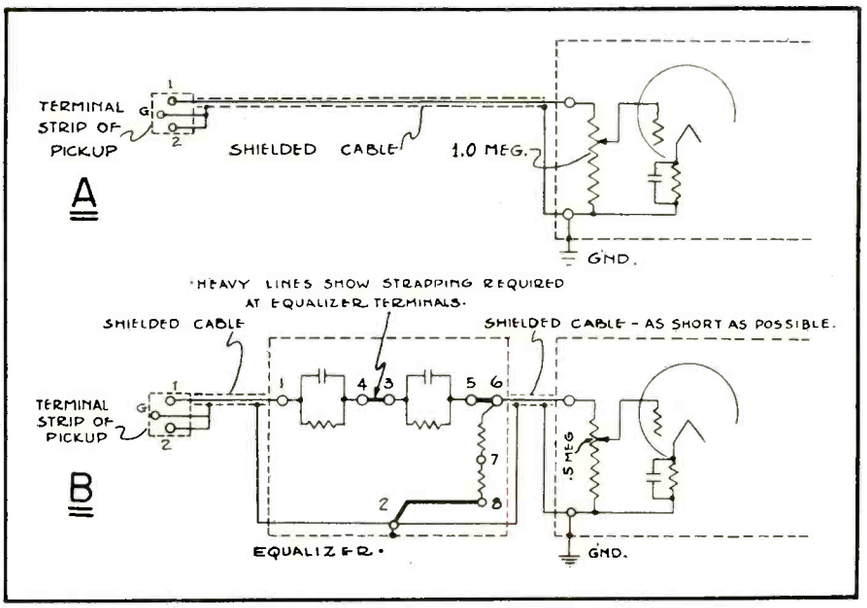
Radio dealers who own one or more portable sound systems find that they can derive an excellent income through the rental of same. Many times it is wise to have either an extremely versatile sound system of relatively high power, or more than one system for different applications. For indoor sound systems, the market is available for rental for dances, club meetings, and public gatherings of all kinds. For outdoor installation — athletic events, such as schools or professional, as well as public meetings, rallies, etc.

When estimating for the proper sound equipment for an indoor job, it is generally advisable to look over the space required to cover, taking into consideration the type of walls, the height of the ceiling, whether there are draperies or other sound-deadening materials. Then, too, it is helpful to know the approximate size of the audience expected as well as whether it is a dance or meeting, etc. These are all pertinent details in estimating audio power required to adequately cover an indoor installation. Always be sure to have a sufficient amount of loud speakers so that distortion does not result from overloading them. The proper placement of the speakers is generally dependent upon the size of the space you intend to cover. Always take into consideration that an empty hall requires far less power to cover when empty than with an audience present, particularly when using where people are dancing.

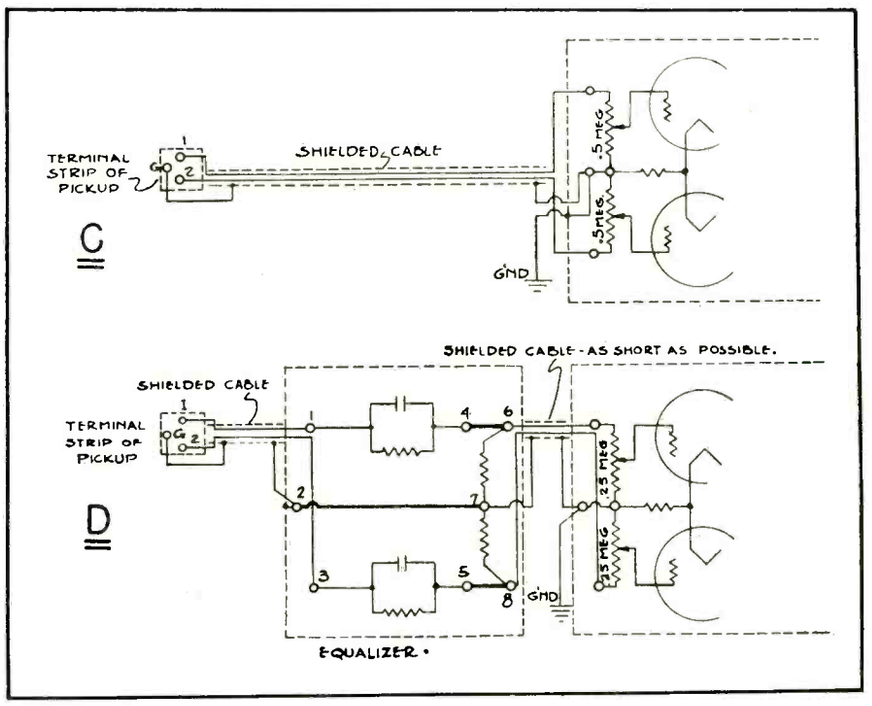
On outdoor installations the main factor to remember is that long power lines sometimes have to be run and unless wire of a fairly heavy gauge is used, a subsequent loss of voltage will be experienced. This will lower considerably the efficiency and power output of the amplifier. Many men wonder why their amplifiers perform satisfactorily in the shop and on an outdoor job perform rather poorly. When this is the case, it is safe to assume that the line voltage at the amplifier is low.

Naturally, on outdoor jobs it is not so essential to worry about acoustics unless there are buildings facing some of the loud speakers. This will undoubtedly cause a "back echo" which is quite objectionable to the audience. If this does exist, it can be remedied by pointing the loudspeaker so that the sound will converge on an angle with the building.

While many radio dealers and servicemen find the maintenance and servicing of sound equipment a profitable addition to their income, many men with a thorough and complete understanding of amplifiers and their component parts have found it to be a good paying and specialized full-time business.



Phono pickups: For constant amplitude home type records, PL-20 pickup is connected as above at "A" for single tube input amplifiers; and as in "C" below for push-pull input. For commercial constant velocity records, equalizer 3761-B of high impedance type should be strapped and connected as in "B" above for single input amplifier; and as in "D" below for push-pull input. *(Code refers to equipment by Brush Development Co., Cleveland).*



Dealer and assistant in typical job-posting chore. Mark-up of job bills with the right gross margin percent is as important as "mock up" of shop with proper modern test equipment for variety of radio problems. Arrangement of tube checker, sig. gen., v.o.m., sig. tracer, meter is trimmed for 1-man operation. Clock is missing. ***(Photo courtesy Dale Distributing Co., N. Y.)***

profit. And unless we are vitally concerned about profits, we won't stay in business very long.

I don't recall exactly what percentage of new businesses survive beyond the first year, nor even the first five years. Most of them die in infancy; you can get the exact percentages of business fatalities from one of the financial journals, or from the Department of Commerce. I can tell you, without gumming up this chat with a lot of dry statistics, that less than 20% of all new businesses survive beyond the first five years, *and the reason for the 80% fatalities is simply the lack of profit.* Therefore, first and foremost, remember that you are in radio servicing to make a profit.

Now making profit is no simple matter although it sounds simple. In its most elementary form, profit is simply the difference between what something costs you and what you sell it for. And in servicing, it is PROFIT that pays your salary.

However, it isn't easy to figure profit, and even less easy to make a real profit. For example: The parts for that job cost you $1.00. You charge the customer $2.00. You've presumably made $1.00 for yourself. But hold on a minute — you're jumping to false conclusions. And it's because of such hasty conclusions that many servicemen soon go broke.

The parts cost you $1.00 and you got $2,.00 for the job. But you didn't

HOW TO "NET" YOUR

Pricing your service jobs for "stay-in-business" net profits means knowing your overhead costs. Make sure you cover them over and above weekly personal "take".

I QUALIFY as an expert about the radio service business because of the wit who defines an expert as "One who is just beginning to understand how little he knows about the subject."

Also, I qualify as an efficiency expert, because my friend the wit again covers the situation adequately with this definition: "An efficiency expert is one who is smart enough to tell you how to run your business, and too smart to start one of his own."

But seriously, fellows, I want to tell you something about the radio service business, giving you the benefit of what I see and hear and read about the radio service business all over the country. We can always learn something from the other fellow. And I'm going to tell you what other fellows are doing to make radio servicing a still better business.

My main theme is PROFIT. My friend the wit says, "Profits, not PROPHETS foretell the future." That's the whole story of successful radio servicing in a nutshell.

We fellows are in business. The main point in business is to make a make a whole dollar for your own personal services. No indeed. To that $1.00 for parts, you have to add your OVERHEAD. By the time the proper overhead is added, the $1.00 cost becomes $1.25 or even $1.50, so that your earnings are reduced to 75¢ or even 50¢ and very often even down to zero.

Headwork on Your Overhead

Believe me, fellows, each and every one of you has overhead. As my friend the wit has it: "It's not difficult to meet expenses these days; one meets

it everywhere." Yes, there are expenses to be met in your setup. You have rent to pay, whether you operate out of a store on Main Street or from your home basement . . . and that rent must be charged proportionately against every job you handle, as a part of the overhead.

Then there are the ordinary business tools. No doubt you've got a telephone, electricity to pay for, traveling expenses, books, service manuals, subscriptions to radio publications, memberships in radio organizations, and perhaps a correspondence course and other means of keeping abreast of radio knowledge. These are expenses—part of your business overhead.

There are your tools, test instruments, service benches, desk, typewriter, file and so on. These items don't last forever: they wear out in time. Or again, they become obsolete and must be replaced by newer models. Will you have the necessary money saved when it comes time to replace those items? You will, if you charge off a good percentage of the cost of such equipment each year, and put the money aside as a trust fund. Your income tax permits such a reduction for depreciation.

These and many other items add up to your actual overhead. The total is really astounding. Your actual overhead can easily run 25% to 35%. Therefore, when you figure the cost of a job, include say 35% as your general overhead, include your own personal services or those of the men working for you, on top of the cost for actual materials. You'll then arrive at your actual cost, and the difference between that actual cost and what you get for the job will determine your net profit. And remember, it's *net profit* that keeps all of us going in business.

Right here we have the very essence of most business failures. Too many would-be businessmen simply don't know their costs. They are fooled into believing that gross profits are real profits. Especially these days, when Uncle Sam and local authorities take a healthy slice out of each and every one of us by way of income and business taxes. Watch your overhead costs and make due provision for meeting them over and above your personal weekly "take".

And so the very first point I wish to make is PROFIT, and I mean a sound, true, NET profit. Also, I want to stress that you've got overhead in your business, and you've got to find out what that overhead amounts to, and then determine what percentage it amounts to on the basis of say $5000 a year or $10,000 a year, or more, as the case may be. Naturally, the overhead percentage per sale or job comes down somewhat as you do more business. But in any event, you should establish a percentage based on anticipated yearly business, and charge to each and every job you handle that 25 or 30 or 35 percent for overhead.

PROFIT POINTERS

1. *Remember*, you're in business to make a PROFIT.

2. *Remember*, gross profit is only the starting point. It's the *net profit* that really counts.

3. *Remember*, in arriving at a net profit you must know your actual costs. And OVERHEAD is a big item in actual costs. Everybody has an overhead. Find out what your overhead is, and see that every job carries part of that burden called overhead.

4. *Remember*, your main stock in trade is knowledge and experience. Also, you need good test equipment for speedy and positive diagnosis of radio failures. Such equipment soon becomes obsolete or wears out, and must be replaced. In order to have the money ready for new equipment, be sure to charge off that equipment against current jobs.

5. *Remember*, your customer is entitled to know how you arrive at your estimate or price, but don't be too explicit. Also, charge list prices for all parts. Only you are entitled to net prices.

6. *Remember*, you cannot afford to make free calls. Regardless how simple the trouble may prove, you're entitled to payment for time and travel.

7. *Remember*, you've got to build up and maintain a reputation for honest dealings. Confidence is the main stock in trade.

8. *Remember*, you cannot afford to use anything less than the best parts available. Those war surplus bargains are a gamble. You cannot afford to gamble with set repairs.

9. *Remember*, you've got to keep up with the rapid progress of radio by means of good reading matter. Keep up your working library.

10. *Remember*, there's more than enough servicing work to be had. You don't have to overcharge to make a good profit. You are in a good line of work. There is a great future ahead. The rest is up to you.

PROFITS

by CHARLES GOLENPAUL*

Charley Golenpaul

**Sales Manager, Aerovox Corp., New Bedford, Mass.*

You Are a Technician

A fair price in this radio servicing game is one based on an *honest* repair job and covering the cost of parts, labor, your overhead, and your net profit. Worthwhile trade is willing to pay such a fair price. Those who are unwilling to pay a fair price are just not worth bothering with. And your competitors who cater to those cheap folks simply won't be around very long.

The main thing the radio set owner wants is to get that inoperative set going again. When he calls you, you

can be sure he's usually fussed around with the trouble himself. He's had that smart son or nephew or brother-in-law monkey around with it too. But present-day radios don't respond to such home remedies. The handymen with screwdriver and pliers doesn't get very far these days. It takes test instruments plus a lot of know-how to figure what's wrong with the set — to find that low-emission tube or that broken-down capacitor or that burned-out transformer.

Consider a parallel case: Little Annie is deathly sick, all of a sudden. Mother reads that family medicine book or the old almanac, and tries to fit some stock remedy to Annie's particular symptoms. Then the corner druggist is consulted. One or two patent medicines may be tried. But when all such makeshifts fail, the doctor is summoned. And his word goes! He scribbles some Latin and numbers on a slip of paper and tells you to get the prescription filled at the corner drug store. There's complete confidence now that Annie will soon get well. At any rate, the doctor gets his three bucks for 15 minutes of his precious time, without any argument whatsoever.

Now you as a radio serviceman are very much in the same position. True, no life is at stake, but the family's routine entertainment is dead for the moment and you are the fellow to bring it back to life again. You're the doctor. You've got the savvy. You can make that radio play again. And you're entitled to your fair price.

Loose Talk — Lose Job

Now how do you deport yourself before customers? That's the real test in getting fair prices. I'll assume of course that you are neatly dressed, polite, businesslike, and speak convincingly. Those basic points must be taken for granted. But — and please pardon the question — do you suffer from a BIG MOUTH? I find that many servicemen simply give away their savvy without realizing it, and having given away their main stock in trade, they are surprised at the loss of business. Let me illustrate:

You are checking a radio set in front of your customer. Incidentally, that's a bad business to start with: all sets should be checked at your convenience and when the customer isn't around to bother you. But this is one of those exceptional cases: you've got to check the set while the customer is around. Alright. You go to work with your test equipment. You soon find out that a tube has low emission; a capacitor is shot; a resistor is drifting excessively. Knowing what has to be replaced, you figure up the cost of materials, the amount of labor, that matter of overhead, and your fair net profit. You give the set owner the cost. PERIOD.

But now there is the big-mouth serviceman who wants to show how smart he is. Or at least he wants to prove that the price is correct. He may point out that this tube, Type XYZ, has to be replaced; that capacitor, an 8 mike 450 volt electrolytic, has to be replaced; and that carbon resistor, 1-watt 100,000 ohms, has to be replaced. He may even go so far astray as to quote net costs on those parts, rather than the full list to which he's entitled on resale. Whereupon foxy Mr. Set Owner says that the price seems kind of high and he'll have to think it over.

Mr. Set Owner in due course turns up at a jobber's store. In professional lingo he asks for a Type XYZ tube, an 8 mike 450 volt electrolytic, and a 1-watt 100,000 ohm carbon resistor. He gets them at your net cost, because he speaks the language of the trade, duly taught him by the big-mouth serviceman. And if he's just a shade above a moron, he can install those parts and his set is as good as new again. Whereupon the big-mouth serviceman has done himself out of another job.

Don't talk! Don't give away valuable information! Be as concise as necessary to justify your estimate. That's enough. Remember, the doctor didn't go into lengthy explanations regarding little Annie's ailment. Nor did he tell the family in plain English what those Latin words and numerals meant on the slip of paper. Nor does the druggist say that the $1.00 prescription could have been compounded at home from such common ingredients as baking soda and common salt at a cost of a couple of pennies, in many cases. No sir! The family is paying for KNOWLEDGE. And that's mainly what you as a serviceman have for sale.

In your estimate or price, you are entitled to full list prices for parts and supplies. You are entitled to be paid for your time, even if it's only to check a set and give an estimate away from your shop. You are entitled to charge for your time from the moment you leave your shop until you get back. Remember, doctors don't make many free calls.

Profit Has Its Price

Yes, get fair prices for your jobs. Make a decent profit. But this does not mean that you should cheat or gyp. Cheating or gypping is the other extreme of working for nothing. And one extreme is as bad as the other.

Some servicemen don't take any chances with the making of ample profits. They just work customers for all they can get. The Reader's Digest, a few years ago, turned up some very flagrant cases of this sort and for a time made it pretty bad for all servicemen. We just cannot afford to have that sort of reputation get around.

Today there is enough legitimate work to go around. We can well afford to be honest. So why tell a set owner that the job will cost $10 when all that is necessary is to solder a broken connection or push a loose tube down into its socket or tighten the antenna binding post that has become loosened? Of course the serviceman is entitled to charge for the call, no matter how simple the trouble may be. But between such a legitimate fee and the charging of many extra dollars on trumped-up defects, there is all the difference between an honest living and downright crookedness.

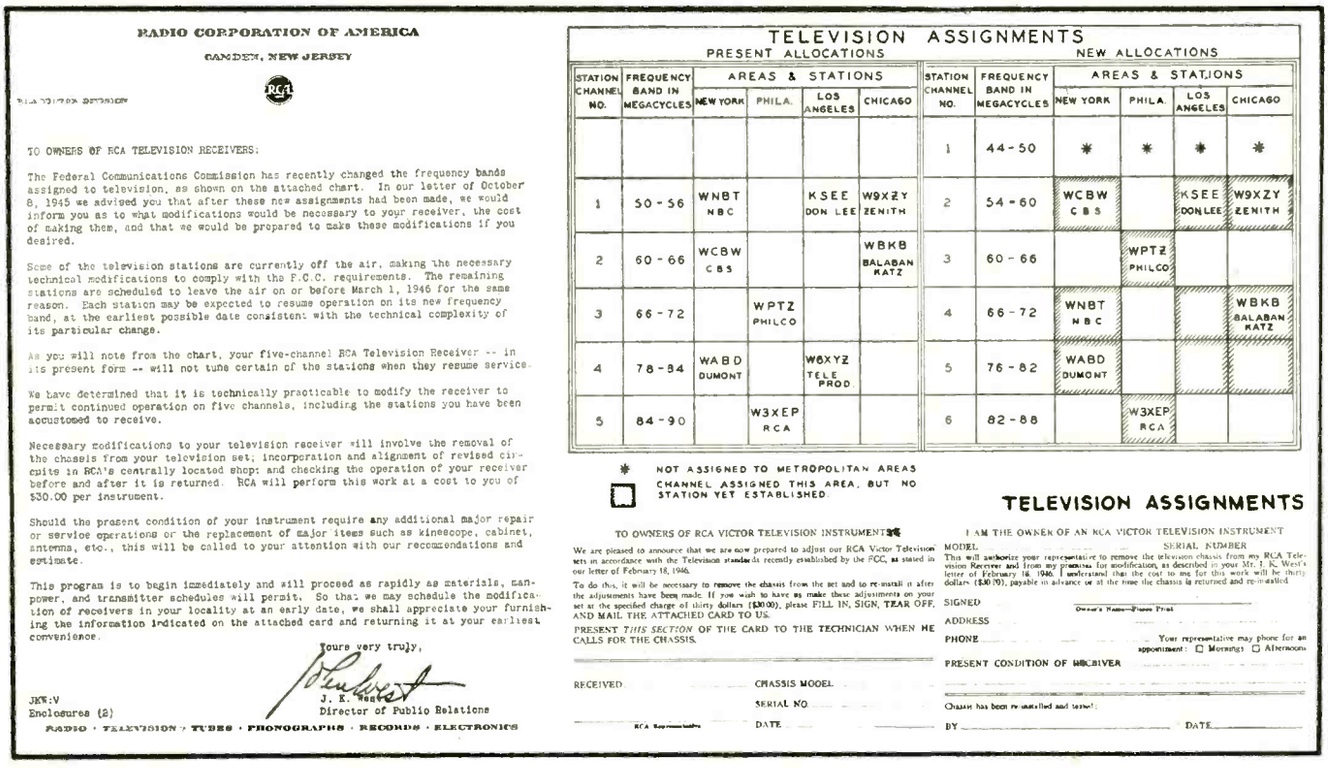
The fact that a serviceman is a gyp gets around mighty fast. If the gyp is set up in a trailer and therefore can shift from place to place, he doesn't have to worry too much about what people will think after a while. But if he's set up permanently in a community, then good reputation is an essential asset.

The *right* price for a job is that which constitutes a real bargain to you and to the customer. As my friend the wit puts it, "A bargain is a transaction in which each party thinks he has cheated the other." I rather like that definition although it is a bit smelly. If the customer thinks your price was reasonable, and you know you've made a fair profit, then it's really a bargain.

But to insure the bargain, it is necessary that your job stand up as it should. There are some servicemen who don't give a rap whether the job stands up or not, provided they have been paid. That's just another form of gypping, and leads to hard feelings and eventual exist from business.

If the set owner has paid your price without quibbling, he's entitled to have the repair job stand up for six months or a year. However — and this is a point I wish to emphasize — it is well

[*see page* 56]



RADIO CORPORATION OF AMERICA

CAMDEN, NEW JERSEY

TO OWNERS OF RCA TELEVISION RECEIVERS:

The Federal Communications Commission has recently changed the frequency bands assigned to television, as shown on the attached chart. In our letter of October 6, 1945 we advised you that after these new assignments had been made, we would inform you as to what modifications would be necessary to your receiver, the cost of making them, and that we would be prepared to make these modifications if you desired.

Some of the television stations are currently off the air, making the necessary technical modifications to comply with the F.C.C. requirements. The remaining stations are scheduled to leave the air on or before March 1, 1946 for the same reason. Each station may be expected to resume operation on its new frequency band, at the earliest possible date consistent with the technical complexity of its particular change.

As you will note from the chart, your five-channel RCA Television Receiver -- in its present form -- will not tune certain of the stations when they resume service.

We have determined that it is technically practicable to modify the receiver to permit continued operation on five channels, including the stations you have been accustomed to receive.

Necessary modifications to your television receiver will involve the removal of the chassis from your television set; incorporation and alignment of revised circuits in RCA's centrally located shop; and checking the operation of your receiver before and after it is returned. RCA will perform this work at a cost to you of $30.00 per instrument.

Should the present condition of your instrument require any additional major repair or service operations or the replacement of major items such as kinescope, cabinet, antenna, etc., this will be called to your attention with our recommendations and estimate.

This program is to begin immediately and will proceed as rapidly as materials, manpower, and transmitter schedules will permit. So that we may schedule the modification of receivers in your locality at an early date, we shall appreciate your furnishing the information indicated on the attached card and returning it at your earliest convenience.

Yours very truly,

J. K. West
Director of Public Relations

JKW:V
Enclosures (2)

RADIO · TELEVISION · TUBES · PHONOGRAPHS · RECORDS · ELECTRONICS

TELEVISION ASSIGNMENTS

PRESENT ALLOCATIONS						NEW ALLOCATIONS					
STATION CHANNEL NO.	FREQUENCY BAND IN MEGACYCLES	AREAS & STATIONS				STATION CHANNEL NO.	FREQUENCY BAND IN MEGACYCLES	AREAS & STATIONS			
		NEW YORK	PHILA.	LOS ANGELES	CHICAGO			NEW YORK	PHILA.	LOS ANGELES	CHICAGO
						1	44 - 50	*	*	*	*
1	50 - 56	WNBT NBC		KSEE DON LEE	W9XZY ZENITH	2	54 - 60	WCBW CBS		KSEE DON LEE	W9XZY ZENITH
2	60 - 66	WCBW CBS			WBKB BALABAN KATZ	3	60 - 66		WPTZ PHILCO		
3	66 - 72		WPTZ PHILCO			4	66 - 72	WNBT NBC			WBKB BALABAN KATZ
4	78 - 84	WABD DUMONT		W6XYZ TELE PROD		5	76 - 82	WABD DUMONT			
5	84 - 90		W3XEP RCA			6	82 - 88		W3XEP RCA		

* NOT ASSIGNED TO METROPOLITAN AREAS

☐ CHANNEL ASSIGNED THIS AREA, BUT NO STATION YET ESTABLISHED

TELEVISION ASSIGNMENTS

TO OWNERS OF RCA VICTOR TELEVISION INSTRUMENTS

We are pleased to announce that we are now prepared to adjust our RCA Victor Television sets in accordance with the Television standards recently established by the FCC, as stated in our letter of February 18, 1946.

To do this, it will be necessary to remove the chassis from the set and to re-install it after the adjustments have been made. If you wish to have us make these adjustments on your set at the specified charge of thirty dollars ($30.00), please FILL IN, SIGN, TEAR OFF, AND MAIL THE ATTACHED CARD TO US.

PRESENT *THIS SECTION* OF THE CARD TO THE TECHNICIAN WHEN HE CALLS FOR THE CHASSIS.

RECEIVED ..... CHASSIS MODEL .....

SERIAL NO. .....

RCA Representative ..... DATE .....

I AM THE OWNER OF AN RCA VICTOR TELEVISION INSTRUMENT

MODEL ..... SERIAL NUMBER .....

This will authorize your representative to remove the television chassis from my RCA Television Receiver and from my premises for modification, as described in your Mr. J. K. West's letter of February 18, 1946. I understand that the cost to me for this work will be thirty dollars ($30.00), payable in advance or at the time the chassis is returned and re-installed.

SIGNED .....

Owner's Name—Please Print

ADDRESS .....

PHONE ..... Your representative may phone for an appointment: ☐ Morning ☐ Afternoon

PRESENT CONDITION OF RECEIVER .....

Chassis has been re-installed and tested.

BY ..... DATE .....

RCA Promotes Television Conversion Business

PRE-WAR RCA Victor television receivers will be converted to receive programs on the new frequency channels allocated by the FCC, through the RCA Service Company, Inc., set up for the purpose. Service shops in the New York, Philadelphia, Chicago and Los Angeles areas—points of concentration for television transmission—will, on request from a set owner, either direct or through the RCA dealer in the area, bring in the chassis, incorporate revised circuits and then reinstall and test it in the owner's home. All known owners of RCA television receivers have been notified by letter that the service is available at a charge of $30.

The new allocations have shifted the frequencies of existing television stations, both by changing frequency bands for given channel designations and by moving stations to new channels. Since Channel 1 under the new set-up is not assigned to metropolitan areas, circuits on the RCA receivers, now providing for reception on Channels 1 to 5 inclusive, will be changed to receive programs on Channels 2 to 6 inclusive. In detail, the new allocations are: Channel 1, 44 to 50 mc; Channel 2, 54 to 60 mc; Channel 3, 60 to 66 mc; Channel 4, 66 to 72 mc; Channel 5, 76 to 82 mc; Channel 6, 82 to 88 mc.

All television stations are now off the air, and will remain out of service until the necessary technical modifications of transmitters can be completed.

THE PROMOTION

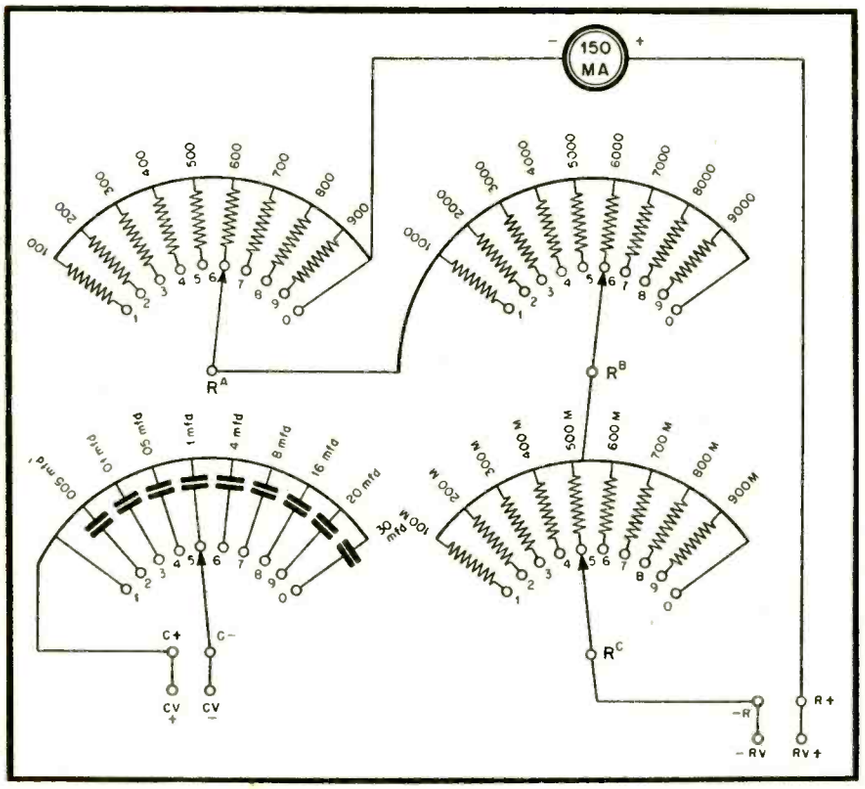
. . . *This dealers can do also.*

THIS "package" (see illustration) sent to all known owners of television receivers, consists of 1, a letter explaining the chanegeover in video channels; 2, an offer to take care of changing the circuits for a certain fixed sum; 3, a request for the business, with an offer to check the receiver (while it is being worked on) for operating deficiencies and submit an estimate for work that may be needed to set it right; 4, and a "tie-up" request for a response by means of an enclosed fold-over postcard, both faces of which are shown at lower right of the illustration. A chart of the former and new video channels as they affect a particular television receiver is also included (shown upper right in the illustration).

Here's the way the "big fellow" does it. This dealers can do, also. . .

To promote (for example) FM changeover business, to promote special antenna installation business, to promote any special major appliance reconditioning business, to promote that essential "spring cleaning" service which many radio sets need after a hard winter of use and abuse.

With radios and appliances in full supply not really coming until midsummer and fall (according to the way industry authorities speak nowadays) the promotion of sources of service business such as mentioned above becomes a *must* for all dealers who wish to be on hand solvently for the big merchandise and merchandising days just ahead.



Above: Figure 2A. Across: Fig. 2B.

noting the condensers used in same.

Next, turn the potentiometer to zero rather slowly so as not to disturb the electrical circuits with any voltage surge which would occur if the switch was merely turned on or off.

Then bridge a new condenser across a condenser suspected of being faulty. Then again turn the potentiometer to apply full voltage to the radio. Allow radio to warm up. If the set under test performs normally, turn the potentiometer slowly to zero again and remove the condenser. Turn the potentiometer to full again and if the radio is performing poorly or dead as it was when the tests were begun, you can be quite sure the defective part has been located. This test can be repeated a few times to prove that the defective part has been located, but no changes should be made and no metal object should come in contact with the chassis or any part of the radio while the line voltage is on the radio, as a disturbance may be made which will heat the defective part.

If the faulty part is not located on the first test, repeat on other condensers and resistors to locate opens.

Short Cuts

Use of "Substitution Block" described

by MILTON J. BORCHERT

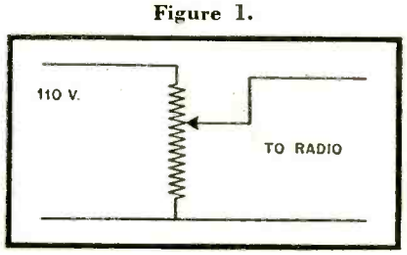
MUCH of the trouble experienced in locating intermittents when the service man attempts to locate the defective part and applies the test probe to the circuit, is that the disturbance caused by the contact of the probe to a circuit preceeding the faulty one usually causes a voltage surge which temporarily heals the break in the defective unit, and tests can not be easily made until the part breaks down again. A method for eliminating this vexing situation is explained below.

Intermittent "Fits"

In series with the line cord install a variable resistor large enough to reduce the voltage to a negligible value; or use a potentiometer of 150 ohms or more, which should be connected as shown. (*Fig. 1.*)

Assuming that the radio is in one of its intermittent "fits" the first thing to do is to use a *signal generator* and a piece of insulated wire attached to the "hot" clip of the signal generator. This wire should be long enough so that the clip will not come in accidental contact with the chassis. Put a small loop on the end of the wire. Then starting with an audio signal place the loop near the grid of the last audio tube and work back to the antenna stage placing the loop near each grid and changing the signal to the I. F. frequency and R. F. frequency, as these stages are tested until the signal disappears or drops considerably. In this manner the defective circuit is isolated. When the faulty circuit is located, inspect the circuit

Figure 1.



Intermittent shorts are rather uncommon and intermittents will usually found to be opens.

This system may be used to make *volt-ohmmeter* tests, but always turn the radio off by means of the variable line resistor before connecting or removing the meter.

I have found many intermittents so sensitive that even the small voltage of an ohmmeter or condenser checker was sufficient to heal the defective parts; so the first-named system is used almost exclusively.

A handy item for substituting resistors or condensers in this test is il-

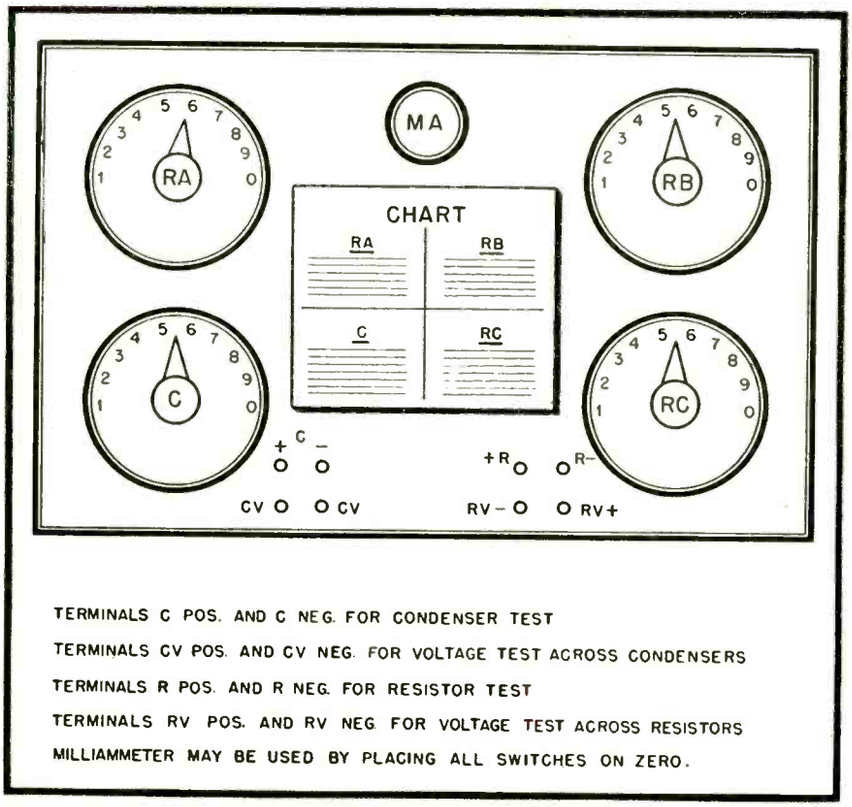
lustrated in *Figs. 2A-2B* and it is also very useful in determining unknown values of resistance or capacitance needed in a circuit. This I call a substitution block.

Use of Substitution Block

For instance, a cathode resistor on a 25L6 was found burned out due to a short in the 25L6. The tube was replaced but the color code was burned off the resistor. The proper size to use was not known and a circuit diagram was not available, as this was the type of radio that did not bear a trade name or model number. The substitution block was used.

A pair of test leads with alligator clips were plugged into the block at terminal "R" and the clips were attached to the proper terminals in the radio. Two leads from the voltmeter were plugged into the block on terminals marked "RV" and the switches set at 1,000 ohms and the voltage drop was read on the voltmeter, and the cathode and resistor current on the milliammeter.

According to the tube characteristics, the bias should be—7.5 volts. The



On Intermittents

resistance was reduced by switching SRA to a lower value one step at a time until the proper voltage drop of 7.5 volts was obtained and the current was noted on the milliammeter. The radio receiver was now working okay. The current was 30 mills with no signal and with a modulated signal from the signal generator applied to the antenna (by use of a loop of wire near the built-in antenna) the maximum signal current was 60 mills, which also was a safe value, using Ohm's Law 7.5E x .060I, the necessary wattage rating of the resistor was found to be .45. By noting the position of the switches, it was found that the resistor now in the circuit was 150 ohms so a 150 ohm .5 watt resistor was installed.

The condenser section is valuable in determing the proper capacity to use in a circuit by substitution. The ease with which one can substitute condensers or resistors with this block is well worth the time and effort it may take to build it.

I received many a burned finger and invented a lot of new cuss words by trying to get both leads of a condenser to contact the right places at the same time, and even burned out a few tubes in AC-DC sets when the leads slipped off and shorted the high voltage to ground before I decided to take a more convenient and sensible way to substitute parts in a radio under test.

Convenient and Safe

For instance, in a receiver that has a hum and the symptom denotes a possible loss of capacity in a filter condenser, the quickest and most used system is to bridge a condenser of proper capacity across the suspected filter.

When the test bench is equipped with a substitution block, a pair of test leads are inserted in the jacks marked C+ and C—. Observing polarity and the switch turned to connect the proper capacity in the circuit, the test leads are applied to the terminals of each filter condenser to quickly find the unit that has lost capacity.

After the defective unit is located, disconnect it from the circuit and again connect the substitution block to the circuit and vary the capacity by means of switch C until the proper capacity is found which will give adequate filtering action. Now connect the voltmeter to the jacks marked CV and turn the set off to allow the tube cathodes to cool.

Again turn the set on and watch the voltmeter for the peak voltage across the condenser before the tubes are hot enough to draw normal current. This will be the voltage applied to the new condenser, to be installed. Popular practice is to install a condenser of 50 per cent higher voltage rating than the peak voltage to be applied. The capacity shown to be in the circuit by switch C will be the minimum capacity to install.

This system is more convenient and safer for both the radio and the service dealer.

Where the radio is brought to the shop in good working condition and the complaint is intermittent operation, the defective unit may be caused to open by changing the temperature of the whole radio. This is accomplished by placing the chassis in a refrigerator or heating it with an electric heater.

To locate the defective unit by heating or cooling one part at a time, an

[*see page* 65]

CIRCUIT COURT

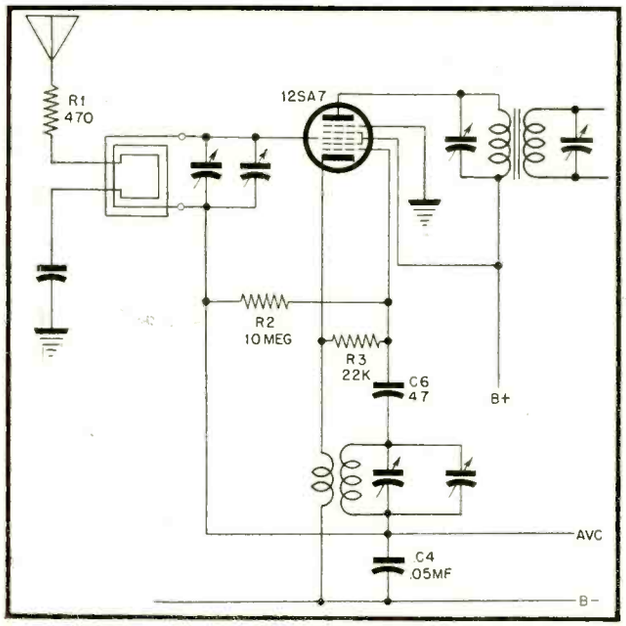


Figure 1.

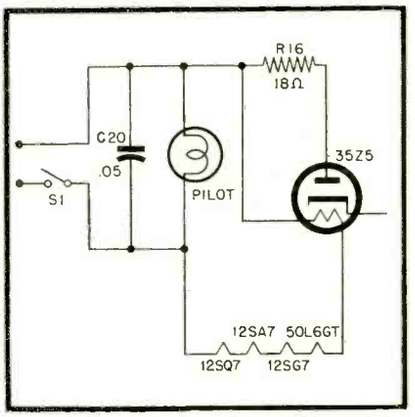
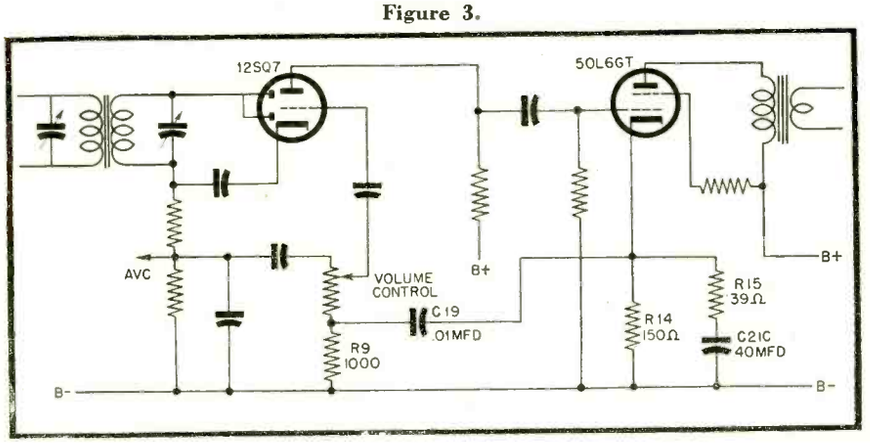


Figure 2.

Figure 3.



GENERAL ELECTRIC, MODEL SERIES 100. *(Figs. 1, 2, 3).*

Fig. 1 illustrates a detail of the GE 100 Series receiver which will also be found in other current offerings. The oscillator convertor circuit is fairly conventional for use with the SA7 type of tube with a four terminal oscillator. Attention is called to the use of R2, 10 meg. resistor, which applies AVC voltage to the oscillator grid. This would be in addition to the bias developed across the grid leak R3, 22K ohms.

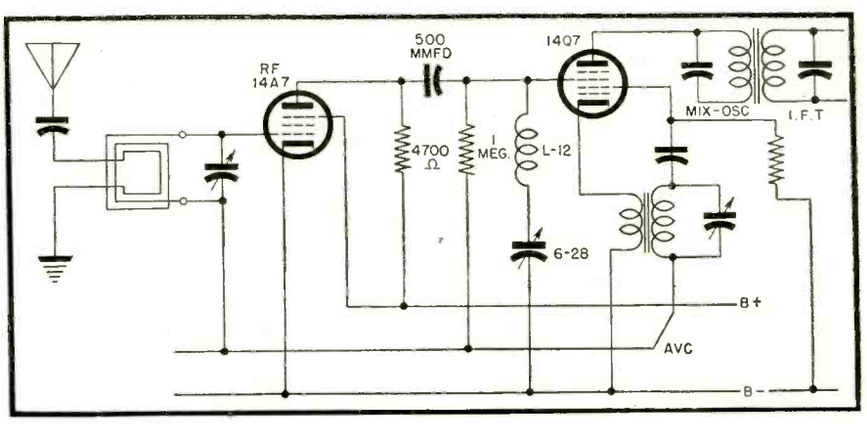
Two purposes are served. An initial bias is supplied to the mixer and I.F. circuits to limit their no-signal currents, and oscillator voltage is decreased on very strong signals. This should reduce "birdie" generation.

Several other items of interest appear in this series receiver. Also shown in *Fig. 1* is R1, 470 ohms, in series with the external antenna lead. This should minimize troublesome effect of resonance at some point in the range of the receiver with a critical length of antenna. It will also prevent the frequent trouble encountered if the antenna lead shorts to the chassis and shorts the coupling coil, thus adding loss to the loop circuit and detuning it from its normal frequency.

This GE set employs a 115-volt pilot lamp, designated type C7, in place of the more common 6.3-volt variety. This should make for better illumination and bulb life. As shown in *Fig. 2*, the circuit is otherwise normal, with R16, 18 ohms, wisely provided to limit surge problems. The tap on the rectifier tube filament is unused. This permits more output from the 35Z5 tube than if part of the filament is shunted with a pilot lamp. Improved tone and output should result.

An interesting feedback circuit is found in this line of G.E. sets. As shown in *Fig. 3*, the cathode resistor of the 50L6 output tube is bypassed with a 40 mfd capacitor in series with a 39 ohm re-

Figure 4.



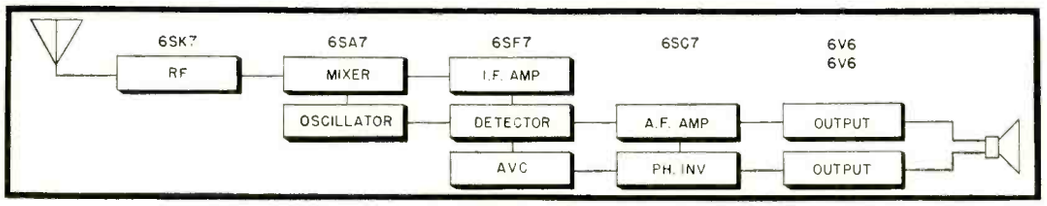


Figure 6.

sistor. The cathode is coupled to the low end of the volume control, which is 1000 ohms above ground, with a large capacitor, C19, .1 mfd. This introduces any low frequency audio, such as 60 cycle hum, not bypassed by C21C, back in the first audio grid circuit where it is amplified —and reversed in phase—and tends to cancel out the unwanted hum.

STROMBERG-CARLSON, MODEL 1100.

(Figs. 4, 5, 6).

In common with other 6-tube AC-DC receivers being currently produced, the Stromberg-Carlson Model 1100 has an RF stage (14A7 tube) in which the grid circuit is toned, but the plate is resistance coupled to the mixer (14Q7). Unlike others, the mixer grid circuit contains a 455 kc trap. This consists of L-1 and C-28 in a series circuit, as shown in *Fig. 4*. When this L-C combination is tuned to the I.F. frequency (455 kc) it acts as a short circuit to any signals of that one frequency, but at any other frequency appears as a very high impedance across the mixer input. This trap should prove very helpful in minimizing aircraft beacon signals and other unwanted interference at the i-f frequency which might appear at the mixer grid.

Another feature of this receiver is a 50 mmfd. capacitor (C7) from the plate of the 35A5 output tube back to the plate of the first audio tube (triode section of 14B6). This will provide a small amount of inverse feedback, particularly at the higher audio frequencies where distortion might be more pronounced. The addition of R-15, 1200 ohms, in the audio coupling circuit will tend to prevent overdriving of the output stage and equalize response over the audio range. *Fig. 5* indicates details.

It should be noted that the cathode bias resistor of the 35A5 output tube is not bypassed. The absence of such a capacitor produces degeneration R-3, 150 ohms, is common to both the grid-cathode and plate-cathode circuits. Distortion is decreased and hum voltages will be less pronounced than if the bypass were present. Output is lowered by this circuit, however, and this is probably one reason the manufacturer rates the normal output at 0.65 watts instead of approximately twice that power in similar receivers.

Fig. 6 shows a block diagram of the new Stromberg-Carlson Model 1020-1120 receiver. It is shown to illustrate an unconventional layout which may become more common. It will be seen that 5 tubes perform 10 functions. Only the 6SK7 RF Amplifier and 5Y3G Rectifier (not shown) perform a single function.

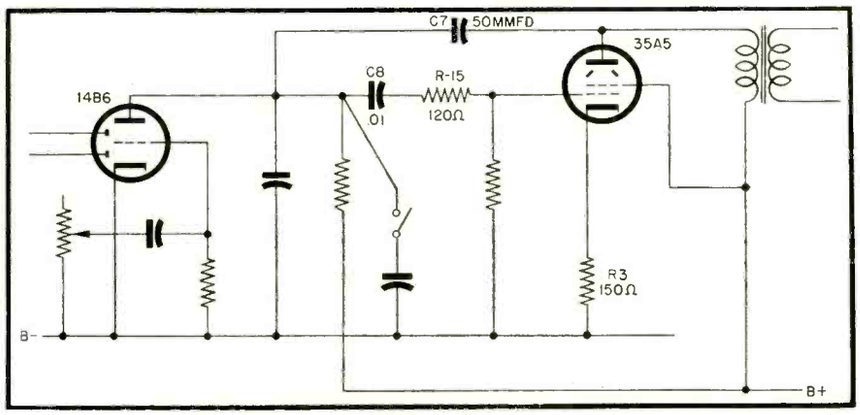


Figure 5.

Attention is directed to the 6SF7 tube which combines the three functions of I.F. amplifier, second detector and AVC generator. This varies from the usual pattern in which the latter two jobs are combined with the first audio amplifier. The 6SF7 contains only a single diode plate but it serves the purpose and relieves the designer from trying to decide where to tie the unused diode in the 6SQ7 type.

ELECTROMATIC, MODEL APH 301.

(Figs. 7, 8, 9).

The Electromatic Mfg. Co. of 88 University Place, New York, N. Y., provides us with a good example of the minor variations possible on a simple basic audio amplifier circuit. Their model APH 301 is shown here in 3 versions.

Type A (*Fig. 7*) has a crystal pickup connected directly across the 500K ohm volume control, feeding a 12SK7 with plate and screen tied together, making it a triode. This is coupled via resistance and capacity to a 50L6 output tube. A simple tone control circuit appears in the 50L6 plate circuit. The filter after the 35Z5 rectifier consists of only one resistor, 4700 ohms, and two 20 mfd. capacitors.

Turning to Type B (*Fig. 8*) we find several minor, but significant improvements. By grounding one side of the voice coil it becomes possible to provide a degree of inverse feedback by connecting the other side to the low end of the volume control. This will make some correction for distortion and reduce hum somewhat. The tone control has been moved to the grid circuit of the 50L6 where it will be more effective. The simple pi filter has been replaced by a two-section affair with a total of 80 mfd. It will be observed that there is better filtering before application of power to the 50L6 plate.

In the "A" version it was connected directly to the filter input since its heavy drain would have made such a small resistor necessary, if it were connected

[*see page* 48]

Figure 7.

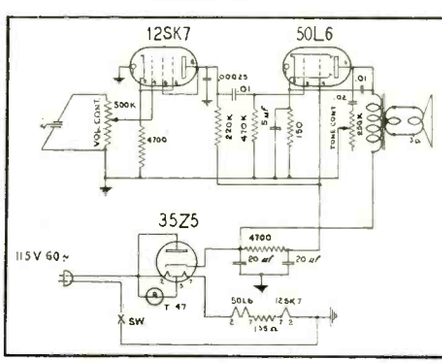
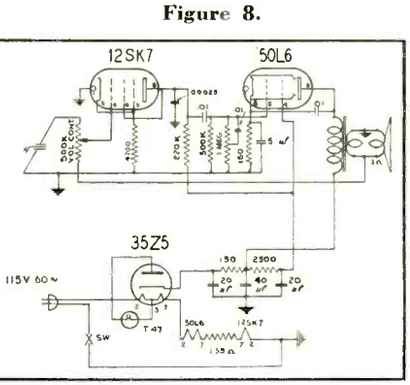


Figure 8.



CIRCUIT COURT

[from page 47]

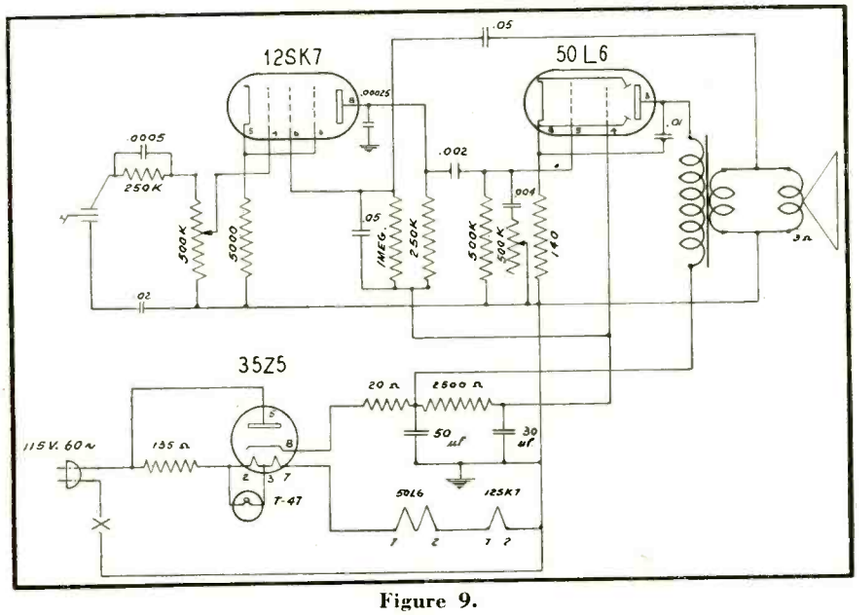


Figure 9.

after filter, that very little filtering action would result. In the "B" version the 150-ohm section only drops the 50L6 plate voltage a few volts, and yet does a good job of hum reduction with the large capacity used. More voltage will also be available for the other elements of the tubes since the second filter resistor is now only 2500 ohms.

Type C, the "de-luxe" version (*Fig. 9*), provides even more modification. The pickup now has a compensating network between it and the volume control. This will provide better high frequency response, but results in a loss of voltage applied to the 12SK7 grid. To overcome this, the 12SK7 has been connected as a pentode so as to raise the grain of the stage.

It will be noted, however, that the screen grid is not bypassed to B— of cathode, but to B+. Feedback is now provided by introducing audio voltage from the voice coil to the screen of the 12SK7. The two .05 mfd capacitors act as a voltage divider. The filter now is modified so as to use only 2 capacitors but still has 2 resistors, though the first one has been dropped to only 20 ohms. Incidentally, the line resistor has been moved from between the tubes to the line side.

New Phono Pickup

Shure Brothers announces the "Glider", their new post-war crystal phonograph pickup. It features the Lever-Type Cartridge and the low-mass Tone Arm.

The cartridge houses the lever-driven crystal, which results in lower needle impedance and higher needle compliance. The lever is so designed that it gives greater shock immunity to the crystal. The light aluminum tone arm is curved and is free from resonance. It has an adjustable swivel screw that prevents the needle from striking the turn-table if the arm is dropped.

There are no springs or counter-weights. It has a scientifically determined frequency response. The standard output voltage is 1.6 volts. Another model will be available in the near future with a higher output voltage. The "Glider" is ideally designed for easy replacement of old, heavy pickups.

New Ward Lines

Ward Products Corp. of Cleveland, Ohio, makers of aerials for car and home, announces the development of a line of specialized antennas for amateur, A.M. - F.M. - television, marine, police and fire emergency communications, forestry and many other uses.

New Auto Radio Vibrator

A new vibrator for auto radio service has been developed by the Electronic Laboratories of Indianapolis, Indiana, announces Walter E. Peek, sales manager and vice-president. Used during the war by the signal corps, it operates at 180 cycles and is particularly adapted to auto radio service. Advantage factors include reliability, small weight and convenient size. Peek predicts that the entire auto radio picture will be based on the use of high frequency vibrators. He stated that the firm will supply service outlets as soon as manufacturers have been furnished with an inventory backlog.

Ohmite Resistors Marked

A unique new feature, heretofore not available on such small resistors, has been added to Ohmite "Little Devils". In addition to RMA color coding, these tiny, insulated, molded composition, fixed resistors are now individually marked with resistance value and wattage rating for quick, positive identification.

Little Devils are full ½ watt, 1 watt, and 2 watt resistors, yet the size of the ½ watt is only ⅜" long by 9/64" diameter — the 1 watt, only 9/16" long x 7/32" diameter — the 2 watt, 11/16" long x 5/16" diameter. They are available from distributors' stock in RMA Standard values (10% tolerance) from 10 ohms to 22 megohms. For complete information write for Bulletin No. 127 to Ohmite Manufacturing Company, 4835 Flournoy Street, Chicago 44, Ill.

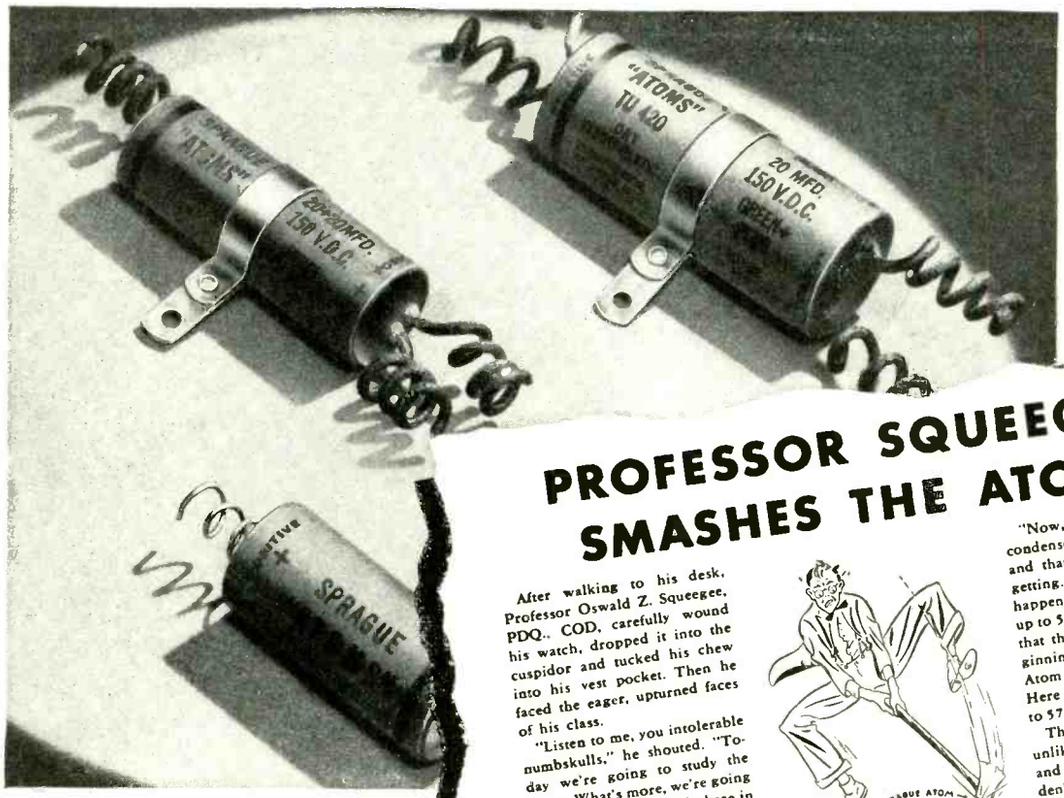
Sixth Plant for JFD

A new factory site covering 50,000 square feet located on 16th Avenue, Brooklyn, N. Y., is announced by Julius Finkel, president, JFD Manufacturing Co. Present plans call for this site to become the largest of the JFD Manufacturing plants. As soon as construction materials are available, a modern two story building will be erected. It will be air-conditioned and will include the latest design in production technique. A special feature in construction will be a recreation hall and cafeteria for the benefit of employees.

Mr. Finkel added that completion of this project will more than double the capacity of JFD providing production to meet a rapidly expanding parts market.

OL' PROF. SQUEEGEE DID THE JOB

. . . way back when



Professor Oswald Z. Squeegee is peeved. Extracts from a recent letter carefully typed on asbestos paper and perfumed with brimstone follow: "Listen here, you jerks. Isn't it about time I got credit as the first man, or reasonable facsimile thereof, ever to smash the Atom? Blow the dust off your files and you'll find I did the job way back in 1940 long before most folks even knew an atom from a dehydrated potato . . ."

And ol' Prof. Squeegee is right! Herewith is reprinted the Sprague advertisement of almost six years ago wherein mention was first made of his startling achievement. Credit where credit is due!

(NOTE: Sprague Atoms are even better today than when Prof. Squeegee performed the now famous experiment. Would he accept a challenge to repeat it now?)

PROFESSOR SQUEEGEE SMASHES THE ATOM

After walking to his desk, Professor Oswald Z. Squeegee, PDQ., COD, carefully wound his watch, dropped it into the cuspidor and tucked his chew into his vest pocket. Then he faced the eager, upturned faces of his class.

"Listen to me, you intolerable numbskulls," he shouted. "Today we're going to study the Atom. What's more, we're going to smash the Atom right here in this room. S'help me!"

The Professor paused, reached for a coughdrop, got an eraser by mistake and chewed it vigorously. Then he cleared his throat and continued:

"The Atom, as you ought to know but probably don't, is the unit of all matter. It is the alpha of everything—the smallest, theoretically indivisible portion into which anything can be divided and still maintain its identity. In that respect, it is a good bit like the salaries most of you will earn when you graduate—if you ever do.

"How to smash the Atom has long puzzled scientists, including myself. However, we won't go into that today. Instead, we'll deal with an entirely different type of Atom—the Sprague Atom Dry Electrolytic Condenser, appropriately named for its small size and great durability. This, however, is a type of Atom that *can* be smashed. What's more I'm gonna smash it!"

After ten minutes search, the Professor finally found an 8 mfd. 450 volt Sprague Atom in his cigar case—also a similar midget dry electrolytic of another make. These he connected into a weird electrical circuit on his desk. Then he slowly turned on the juice.

"Now," he gloated, "both condensers are rated at 450 volts and that's exactly what they're getting. As you see, nothing happens. We'll step the voltage up to 500. Now up to 525. Note that the other condenser is beginning to sizzle, although the Atom is still in good shape. Here we go to 550 volts—now to 575—now to—goodness me!"

There came an explosion not unlike that of a giant firecracker and the heads of the class suddenly disappeared beneath their desks.

"You're all wrong," shouted the Professor gleefully after order had been restored. "You thought I smashed the Atom—but I didn't. It was the other condenser that blew up—not the Atom."

Sure enough, the Atom on the desk was still connected—now hissing a bit under the strain of over 600 volts but functioning perfectly.

"The Atom," continued the professor, "is especially protected against blow-outs—against moisture, heat and whatnot. The way to smash the Atom is not merely a matter of overloading it. The way to smash the Atom is this."

The professor grasped an axe hung over a sign "Use only in case of fire." Swinging this with the skill of a woodchopper and shouting wildly all the while he brought the blunt end down on the Atom—again and again and again.

"There!" he screeched, gleefully looking at the shattered remains. "We've done it. We've succeeded where others have failed. That, gentlemen, is how to smash the Atom. Class dismissed."

A TYPE FOR EVERY DRY ELECTROLYTIC REPLACEMENT NEED

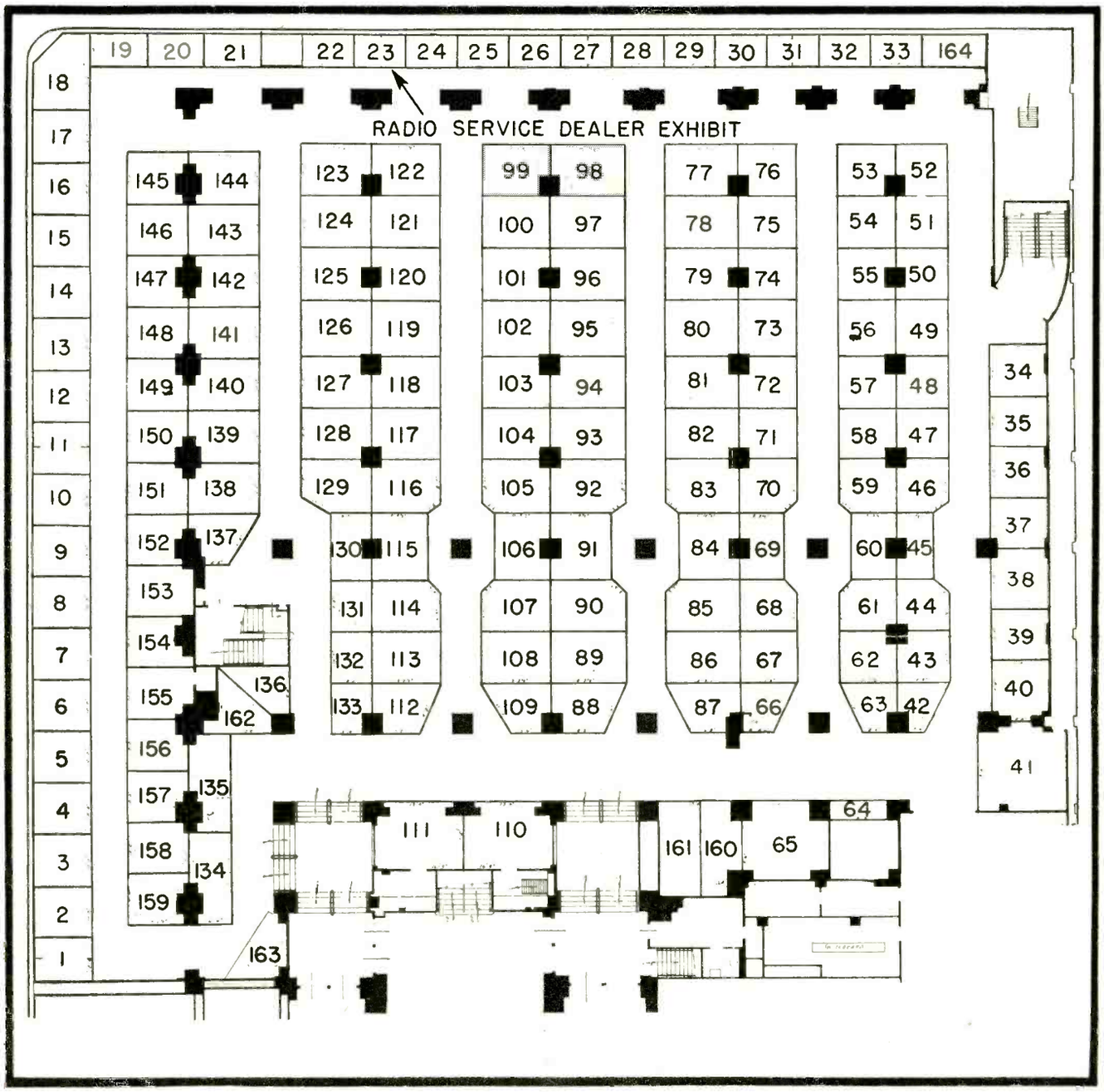
SPRAGUE PRODUCTS COMPANY

NORTH ADAMS, MASS.

JOBBING DISTRIBUTING ORGANIZATION FOR PRODUCTS OF THE SPRAGUE ELECTRIC CO.

YOUR GUIDE TO THE

1946 Radio Parts & Electronic Equipment Conference and Show



List of Exhibitors & Key to Floor Plan — Stevens Hotel, Chicago

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Aerovox Corporation	90
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American Coil and Engineering Co.	136
American Condenser Company	129
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Amperite Company	133
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Belden Manufacturing Company	87
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Permoflux Incorporated	32
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In Trade

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AT THE SHOW

The exhibit will also include a complete line of microphones, amplifiers, speakers, baffles, horns, record players, disc recorders and portable sound systems. One of the outstanding items is a 25-watt amplifier incorporating brand-new-styling; also a completely new record player in Fabrikoid carrying case.

Newcomb's New Catalogs

Not among the exhibitors at the Radio Parts and Electronic Equipment Conference and Show, the Newcomb Audio Products Co. announces a series of new catalogs describing fully its lines of sound system equipment and accessories. Special bulletins feature the De Luxe K-Series Amplifiers (KX-30 and H-30), the H-Series Amplifiers, plus impedance matching transformers and plug-in input transformers. Other items include portable sound systems, speakers, mikes and stands. Writes D. Gail Hall, of the agency:

". . . the company is unable to obtain exhibit space. It is unfortunate, at a time when wide attention will be focused on new products and developments in the electronic field, that products of such outstanding quality as Newcomb's will not get a showing.

"The only other way in which the company can attract the attention of jobbers and dealers — in addition to regular scheduled advertising — is through an editorial description of its products . . ."

This, Mr. Hall, we are glad to do — as an item for now, and with pictures to follow in the May issue, as suggested. Copies of catalogs can be had by writing the company at Los Angeles, Calif., or from the new products editor of RADIO SERVICE DEALER.

G-E Replacement Parts at Show

Introduction of a new replacement parts line for the radio serviceman by the G-E Specialty Division will be one of the highlights of the General Electric Electronics Department's exhibit at the Radio Parts & Electronics Equipment Show in Chicago, May 14-16. The Tube Division of the department will also display transmitting, industrial and receiving electronic tubes for radio and parts distributors.

Merit to Show Simplified Line

Merit Coil & Transformer Corporation will exhibit its new line of re-

[*see page* 52]

In Trade

[*from page* 51]

AT THE SHOW

placement transformers at the Radio Parts and Electronic Equipment Show. Embracing a wide range of audio, power and filter choke models, the new line has been designed to supply the jobber with a simplified, compact stock which will meet 90% of customers' requirements. Jobbers will universally welcome the advantages of minimum stock and quick turnover, eliminating excessive inventory and large storage space.

The new line is attractively packaged in green, white and black varnished cartons, featuring the well-known "Merit" trademark. Merit's exhibit will be in Booth No. 52 and catalogs listing and describing these transformers will be available.

Forms DISC Company

A new record label, DISC, goes on the market with release of six albums, announces Moe Asch, of Asch Recording Studios, 117 W. 46th St., New York, N. Y. "DISC," Mr. Asch explained, "develops logically out of our previous work on Asch records. With the end of the war and opening up of new sources of musical and documentary material, it was felt that a new label was necessary to cover an enlarged recording program."

All DISC releases will be in album form, both ten and twelve-inch. Special pressing of selected items will be made in vinylite, the new, tough-surface plastic

Each album will be accompanied with illustrative material in the form of notes or folders prepared by outstanding authorities. A broad scope of subjects and musical material will be covered, including folk songs, Jazz, Ballads, Spirituals, Opera, and Solo Instrumental Works. Albums will be packaged in bright, attractive covers in two, three and four colors. Distribution in the U. S. will be handled by Interstate, New York; Independent, Chicago; Pacific Allied, Los Angeles. A catalog will be ready soon.

Lear Sales Office

The sales office of the Lear Home Radio Division, formerly located in the Furniture Mart building in Chicago, has been moved to Grand Rapids, Michigan, where the company's executive and manufacturing headquarters is located. "The move has been

[*see page* 54]

In Trade

[*from page* 52]

made," said Nate Hast, Merchandise Manager of this division, "to keep all of our promotional activities in one place.

"In order to make distribution as equitable as possible, and also to let each distributor know just where he stands," Mr. Hast added, "we will notify each distributor on the first of the month, what his quota of Lear Home Radios will be for the month after that. In this way, he can coordinate his sales efforts with ours in the right direction, and at the right time."

This, in Mr. Hast's opinion, will overcome some of the weaknesses in the quota system which many manufacturers have adopted in broad general terms, with small prospect of meeting such predictions. As a result, dealers and distributors expend sales and promotional effort at times when stocks are not available, and thus not only lose sales, but create public ill will. By giving dealer and distributor a frank and honest picture of our production, Mr. Hast feels he is playing fair with him and will get a lot more effort out of him.

Mr. Hast is very much enthused over the reception the line received at the recent Furniture Show in Chicago. Four consoles and three table models were exhibited, and the thousands of dealers who saw them were impressed with the fact that the designs were not bizarre or eccentric, but stable, sound, and salable, fitting in gracefully in any American home.

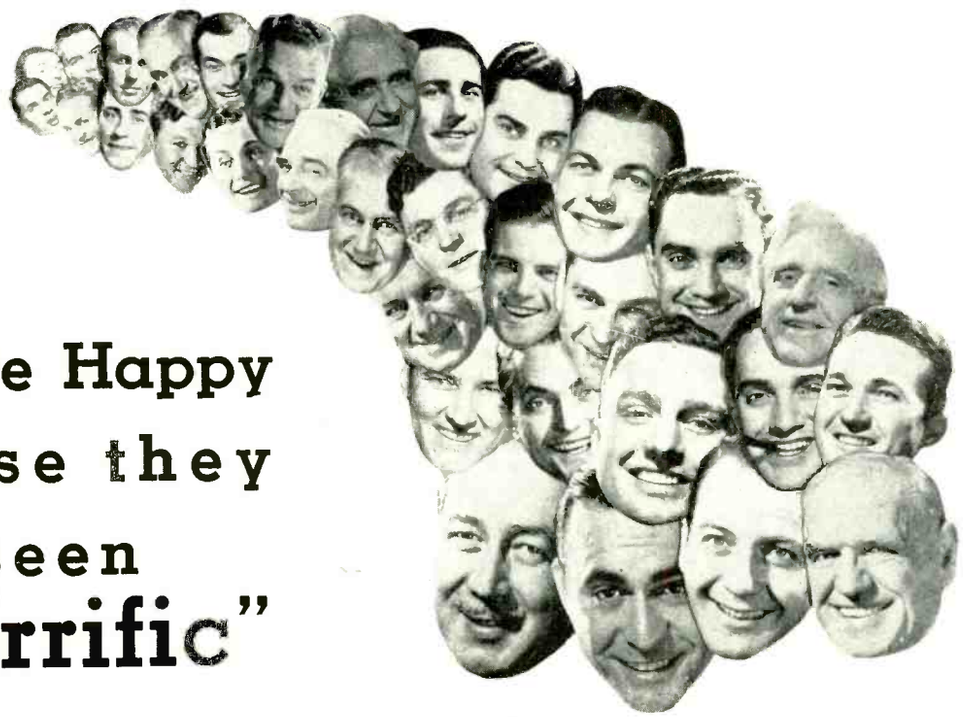
New Dealer Dept.

To meet the expected increase in the demand for radio parts and electronic equipment, operations of the Sun Radio & Electronics Co., Inc., are now concentrated in its new location at 122-124 Duane Street, New York City. The entire third floor, 6,000 sq. ft. of space is occupied, and a perpetual stock of over 10,000 different items is being carried on more than a half million feet of shelves. A new Dealer Sales Department is under the supervision of Mr. Lou Selonek, to provide information and display material for dealers and service men.

Continuity Tester

The handy "W-J" Continuity Tester is an inspection tool used to test for an open circuit or for "shorts" in coils, fuses, lamps, tubes, appliances, etc., and in more complex assemblies

[*see page* 63]



They Are Happy because they have seen the "terrific"

NEW RACON SPEAKERS

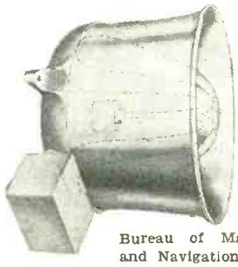
RACON—pioneer and world's largest manufacturer of exponential and air-column horns, speakers and P-M driving units again introduces new speakers, tweeters and paging horns of improved engineering design and broader application. See these new RACONS — a part of the MOST COMPLETE LINE AVAILABLE, a speaker or driving unit for every conceivable application.

See the NEW
RACON SPEAKERS
BOOTH 122
at the "TRADE SHOW"

A catalog describing the complete RACON line is available on request.

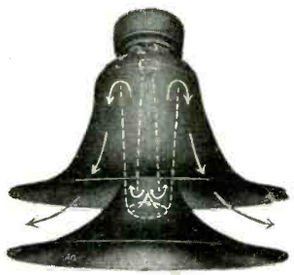
RACON's precision manufacture assures maximum efficiency and high fidelity "true-tone" reproduction, even at full power output. "All-weather" construction design makes RACONS impervious to any climatic condition, prevents resonant effects, assuring long, rugged, trouble-free service. When planning any type of sound installation, large or small, indoor or outdoor, specify RACON.

MARINE HORN SPEAKERS



Re-entrant type speakers using horn type units for marine and general P-A applications — may be used as loudspeaker or as a microphone. Miniature and regular sizes approved by the Bureau of Marine Inspection and Navigation, Department of Commerce, for marine work. In all sizes, miniature, midget, regular and bull, handling from 5 to 50 watts.

RADIAL HORN SPEAKER;



a 3½′ re-entrant type horn. Projects sound over 360 degree area. Stormproof. Made of RACON Acoustic Material to prevent resonant effects.

RE-ENTRANT TRUMPETS

A compact trumpet of the double re-entrant type. Occupies but a small space, nevertheless has a long air column enabling it to deliver highly concentrated sound of the greatest efficiency over long distances. Base and inside cone arm made of aluminum castings, outside bell of heavy gauge aluminum spinning, centre section of RACON ACOUSTIC, material to prevent resonant effects. Available in 6′, 4½′, 3½′, and 3′ air column units.

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

HOW TO "NET" YOUR PROFITS

[*from page 42*]

to state in your bill, and even on a sticker fastened to the chassis, just what repairs have been made. I also like the idea of putting stickers on tubes that have been replaced, with the dates. If the set then breaks down from some other cause, the reasonable set owner can readily understand that you are not at fault. Also, when you estimate on a repair job, it may be well to specify what you are going to do in general terms (don't give away the savvy), and also to mention other things that might be attended to for a 100% repair job, but which are not included in this particular estimate.

New Parts, New Equipment

In connection with making those jobs stand up, I cannot emphasize too much the importance of using the best parts or components. There are many servicemen who are still penny-wise-pound-foolish to the extent of buying the cheapest parts they can find. And that situation is even aggravated today when surplus war stuff is finding its way to the radio parts market. Of course I realize the temptation it is to pick up 8 mike electrolytics for a dime apiece and power transformers for say a half-dollar. But remember, you usually get just what you pay for. Much of that surplus stuff is just plain junk by now. It is usually sold "as is". Most of this war stuff was made several years ago. Much of it has been stored under questionable conditions. Some of it has been used and even abused. You certainly take an awful chance when you install such unknown parts. It may be alright to use the junk in your own assemblies over which you have full control, but to put that stuff into customers' radios is simply to gamble with failures and bad feelings and the loss of money and good will. You can squander many times the few pennies you may have saved at first.

I cannot warn you too much on this point. If you would play safe and sound, continue to buy branded merchandise in original packages, carrying the manufacturer's original guarantee and not an outdated guarantee either. Don't be misled by those so-called war surplus bargains.

Lastly, keep your knowledge and equipment up to date. I cannot urge too much the importance of sound training in this servicing business. Radio sets are becoming increasingly complicated. Already we see signs of more expensive and more complicated sets coming on the postwar market. To the original broadcast receiver there is now being added the all-wave or short-wave feature, FM, phonograph and the record changer. Soon we shall have television in most metropolitan areas. Television receivers are really complicated. It will take a lot more knowledge and experience to install and service television sets. Likewise a lot more equipment than even the better service shops boast of today.

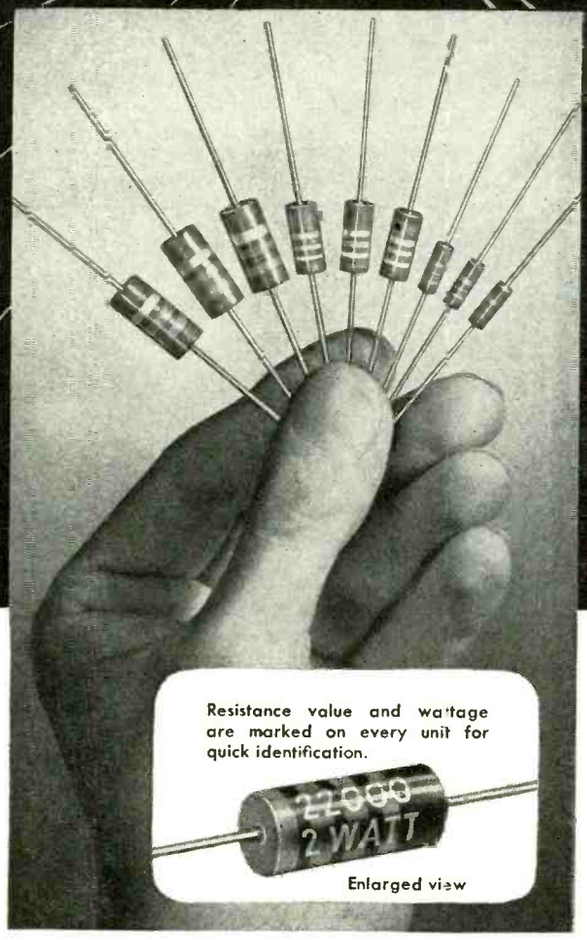
I'd urge you to maintain a good working library of reference books, service manuals, informative house organs, catalogs, and radio publications. I cannot stress too much the importance of membership in servicemen's organizations. You need the exchange of ideas. You require frequent discussion of problems and practices. You should have some mark of distinction between a real serviceman and the tinkering handyman.

NEW ...and Individually Marked

OHMITE Little Devil

INSULATED COMPOSITION RESISTORS

½ Watt • 1 Watt • 2 Watt • ±10% Tolerance



NOW . . . OHMITE makes available to you three *Little Devils* of exceptional ruggedness and stability!

Millions of these tiny molded fixed composition resistors have been used in critical war equipment and in the nation's foremost laboratories. They meet Joint Army-Navy Specification JAN-R-11, including salt water immersion cycling and high humidity tests. They can be used at their full wattage ratings at 70°C (158°F) ambient temperature. They dissipate heat rapidly—have low noise level and low voltage coefficient.

Ratings for maximum continuous RMS voltage drop are high: 500 volts for the ½ watt unit—1000 volts for the 1 watt unit—3500 volts for the 2 watt unit. Units have high insulation breakdown voltage.

Little Devils are completely sealed and insulated by their molded plastic construction. Leads are soft copper wire, hardened immediately adjacent to resistor body—strongly anchored—and hot solder coated.

Light, compact, easy to install. All units color coded. Resistance value and wattage are marked on every unit for quick identification. Available from stock in Standard RMA values from 10 ohms to 22 megohms.

Little Devils are ready for any job . . . anywhere. And they're low in cost. Order them now!

AVAILABLE ONLY THROUGH OHMITE DISTRIBUTORS

Meet Joint Army-Navy Specification JAN-R-11

AVAILABLE FROM STOCK IN STANDARD RMA 10% TOLERANCE VALUES

TYPE	SIZE		RESISTANCE RANGE	MAXIMUM VOLTS	LIST PRICE
	LENGTH	DIAM.			
½ Watt	3/8"	9/64"	10 Ohms to 22 Meg.	500	13c
1 Watt	9/16"	7/32"	10 Ohms to 22 Meg.	1000	17c
2 Watt	11/16"	5/16"	10 Ohms to 22 Meg.	3500	25c

OHMITE MANUFACTURING COMPANY
4845 FLOURNOY STREET, CHICAGO 44, U.S.A.

Send Now for BULLETIN No. 127

Gives complete data and list of RMA values. Includes dimensional drawings and handy color code. Write for it today!

Be Right with

OHMITE

RHEOSTATS • RESISTORS • TAP SWITCHES • CHOKES • ATTENUATORS

RMA Sound Standards

A program for standardizing radio and sound amplifying equipment in the nation's schools has been approved by a joint committee of radio manufacturers and educators, announces the Radio Manufacturers Association. The plans call for the establishment of a set of minimum standards.

Tentative specifications cover five classifications of school radio and sound amplifying equipment — central program distribution systems, classroom receiving sets, portable transcription players, speech input units and recorders.

Shop Notes

Safety in Checking High Voltages in a Cathode Ray Oscilloscope or a Television Receiver

It is often necessary to check the overall voltage drop between points A and C or B and C. In many circuits these voltages will be dangerously high and their measurements require extraordinary safety precautions such as: using test leads with extra-heavy insulation on the probes; arranging the unit so that no portion of it comes into contact with the person making these measurements; and discharging the filter condensers connecting across the different portions of the voltage divider.

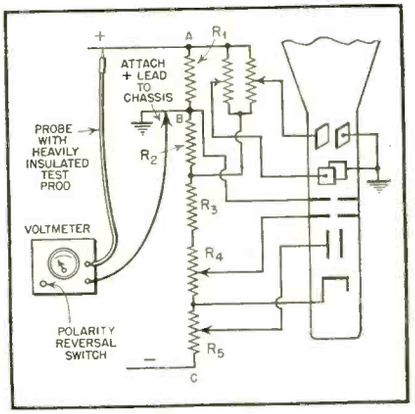


Figure 1.

In addition to these safety precautions, shock hazards may be reduced by observing the following testing techniques. One of the test prods is clipped to the chassis by means of an alligator clip (this should be done first), and the voltages between B and A, and between B and C are measured by shifting the free probes to points A and C respectively. The sum of the two voltages thus measured is the total voltage between A and C. This permits the measurements of voltage to be made with one hand.

If the connections in the diagram (*Fig. 1*) are followed, a reversed reading will result when testing the voltage between B and C. Many modern VOMs contain a polarity reversal switch which can be utilized to correct such a reversed reading. This switch eliminates the necessity of reversing the leads. If no reversal switch is available the safest procedure is to disconnect the unit and reverse the leads in the tip jacks of the VOM. Make sure that your fingers never come in contact with any of the exposed metallic portions of the test prods.

Testing for Open and Intermittent Filament in AC-DC Receivers

A handy tester for open and intermittent tube filaments in AC-DC receivers is

[*see page 62*]

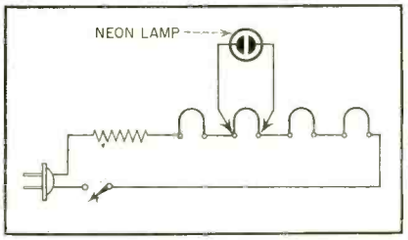
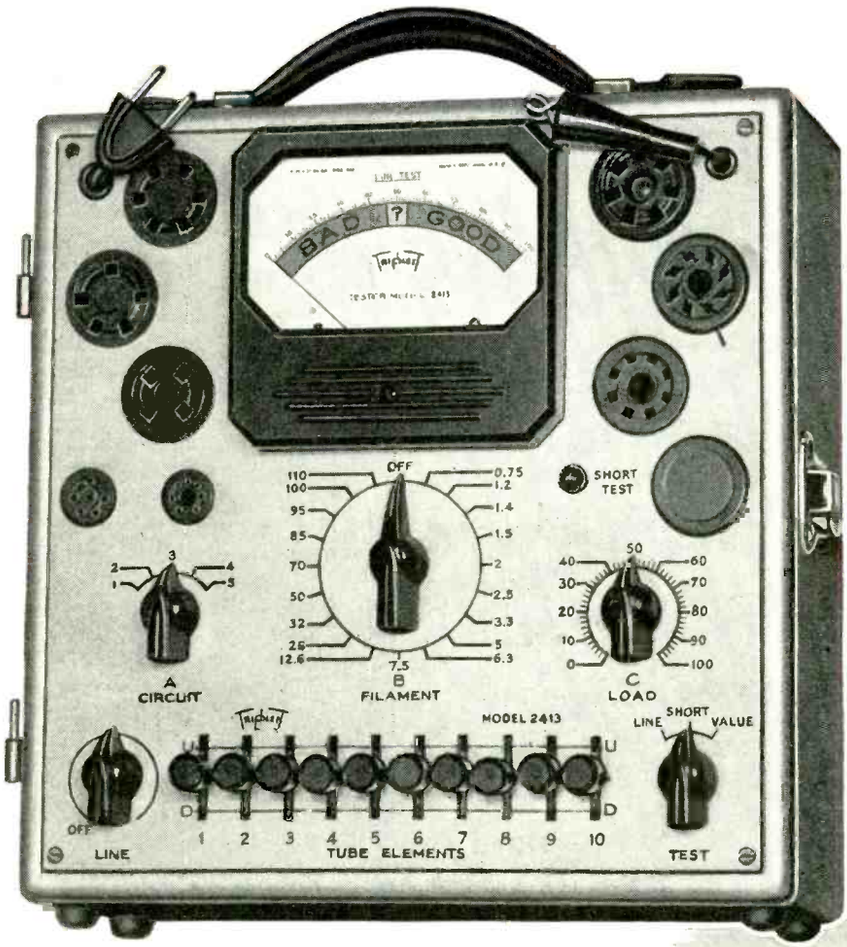


Figure 2.



MODEL
2413
is another member of the NEW TRIPLETT Square Line

The New Speed-Chek Tube Tester

MORE FLEXIBLE • FAR FASTER • MORE ACCURATE

Three-position lever switching makes this sensational new model one of the most flexible and speediest of all tube testers. Its multi-purpose test circuit provides for standardized VALUE test; SHORT AND OPEN element test and TRANSCONDUCTANCE comparison test. Large 4" square RED•DOT life-time guaranteed meter.

Simplicity of operation provides for the fastest settings ever developed for practical tube testing. Gives individual control of each tube element.

New SQUARE LINE series metal case 10" x 10" x 5½", striking two-tone hammered baked-on enamel finish. Detachable cover. Tube chart 8" x 9" with the simple settings marked in large easy to read type. Attractively priced. Write for details.

See the 1947 Triplett Models. Radio Parts Show Booth 139.

Additional Features

- Authoritative tests for tube value; shorts, open elements, and transconductance (mutual conductance) comparison for matching tubes.
- Flexible lever-switching gives individual control for each tube element; provides for roaming elements, dual cathode structures, multi-purpose tubes, etc.
- Line voltage adjustment control.
- Filament Voltages, 0.75 to 110 volts, through 19 steps.
- Sockets: One only each kind required socket plus one spare.
- Distinctive appearance with 4" meter makes impressive counter tester — also suitable for portable use.

STANDARDS ARE SET BY TRIPLETT

Precision first ...to last

Triplett

ELECTRICAL INSTRUMENT CO. BLUFFTON, OHIO

Dealers Merchandise Discs

[*from page* 28]

tures, tables, counters and listening booths are finished in walnut. A novel feature of the five roomy sound-proof booths is the installation of germicidal lamps which automatically switch on when the doors are opened. Booths are air-conditioned for further listener comfort. A large three-section display window fronts the store. Flower boxes form lower frame of circular window interior. For their initial display, Heppe Company obtained through the local distributor an original carving of the RCA Victor dog from which miniature replicas are being made for nation-wide distribution.

Opening of the new quarters was publicized through the local radio stations, newspapers and by direct mail. Manager Marcellus Heppe, who has been in the record business twenty-five years and is a descendant of the original Heppe music store founders, Harlan B. MacWhorter, Marcellus J. Heppe, Jr. and John H. W. Macklin held open house to 450 patrons and noted musical personalities to mark this milestone in the Heppe musical merchandising career.

Record Dept. Expands

From a by-line to main line merchandise is the story of the "Music Shop", record department of the Stone store in Puyallup, Washington. Formerly occupying a small section of the main floor, expansion was undertaken when Manager Conley Stone noted that the Record Department was bringing in more profit per foot than any other department in the store.

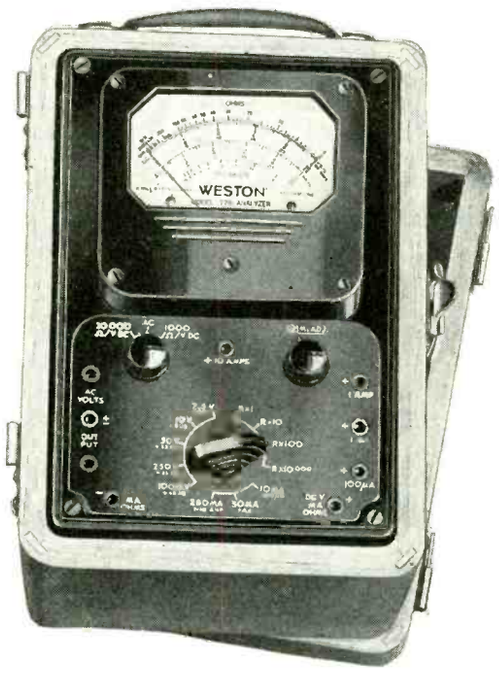
To meet growing demands on this department and to increase over-all volume, more space was allocated. Lacking room for expansion within the store, Mr. Stone had new quarters built adjacent to the parent store. The new "Music Shop" is completely equipped for self-selection merchandising. Modern lighting and air-conditioning provide the utmost in comfort. Three listening booths are available. Ann Boswell is manager.

Department Store Adds Self-Selection

Record sections of the Peoples Store Company, department store chain operating in the Pacific Northwest, are being completely equipped with self-selection merchandising fixtures, according to Clayton Thwing, Merchandise Manager for the organization.

[*see page* 67]

THE NEW, COMPACT
SUPER-SENSITIVE
Analyzer



Weston

MODEL 779

Extreme compactness and lightweight—dual DC voltage sensitivity of either 1000 or 20,000 ohms per volt – five AC and DC voltage ranges, seven DC current ranges, four DC resistance ranges, and five decibel ranges – all carefully selected to meet the broadest requirements of testing and maintenance –precision WESTON resistors throughout—large 50 microampere WESTON meter – temperature compensated including AC ranges – size only 6⅜" x 9⅛" x 4⅞"– furnished in rugged, solid oak carrying case.

Model 779 is designed for use with WESTON Socket Selectors which facilitate checking tube circuit conditions – and with WESTON Televerters for DC voltage measurements up to 10,000 volts.

NOW AVAILABLE . . . see Model 779 at the Radio Parts and Electronic Show . . . Stevens Hotel . . . Booth No. 75. Weston Electrical Instrument Corporation, 605 Frelinghuysen Avenue, Newark 5, New Jersey.

Weston *Instruments*

Albany · Atlanta · Boston · Buffalo · Chicago · Cincinnati · Cleveland · Dallas · Denver · Detroit · Jacksonville · Knoxville · Los Angeles · Meriden · Minneapolis · Newark · New Orleans · New York · Philadelphia · Phoenix · Pittsburgh · Rochester · San Francisco · Seattle · St. Louis · Syracuse · In Canada, Northern Electric Co., Ltd., Powerlite Devices, Ltd.

SHOP NOTES

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a small neon light, the probes of which are successively connected across each pair of tube filaments (*Fig. 2*). The receiver should be turned on during this test. If the light glows, the filament across which the lamp is connected is open. If the light glows intermittently an intermittent filament is indicated.

The reason for the neon light glowing when connected across an open-circuited tube is that the full line voltage is being applied to the neon, with no voltage drop across the ballast and tube resistances since the current is practically zero.

When testing for intermittent filaments, the neon light will not glow, even intermittently, across a filament that is okay. On the other hand if the filament is intermittent, at the instant when the break occurs the neon bulb will glow.

Audio Oscillation in Emerson 3 Way Portable

Audio oscillation in the Emerson 3 way portables can usually be traced to a partially opened filament filter condenser, C30. Observe that the voltage drop across the tube filaments is derived from the cathode current of the pentode section of the 117P7. Since the cathode circuit contains A.F. signal currents, audio regeneration will take place through the tube filaments unless this circuit is properly by-passed (*Fig. 3*).

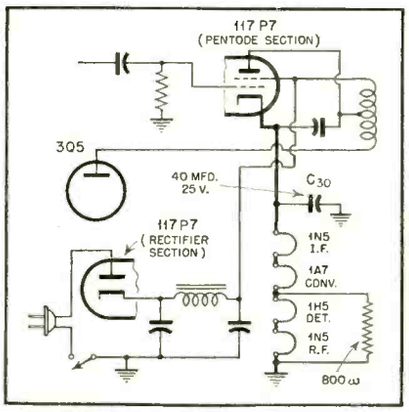

Figure 3. Emerson

TIPS ON ZENITH

1. The pushbutton tuning unit MUST be connected during alignment of all 1942 models as the internal capacities of the tuner will cause considerable variation in R.F. and oscillator circuits if not connected. A 6/32 tapped hole is provided on the chassis for holding the tuner securely during service operations.

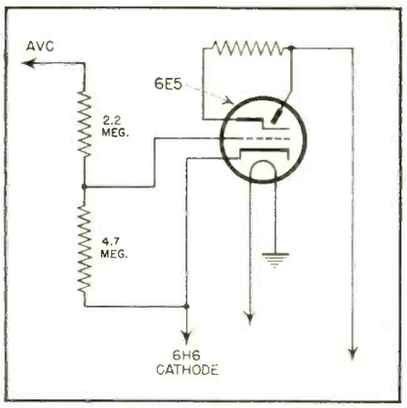

Figure 4. Zenith

2. When the plastic pushbutton and

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In Trade

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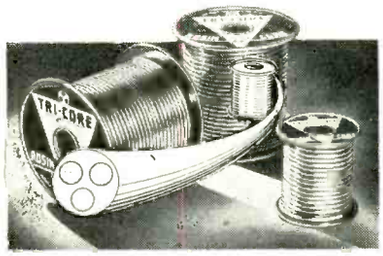
such as radio sets. The unit lights up at the point of application and eliminates the need for looking back and forth at a meter. The tester is adapted to both intermittent and constant production testing. It is equally suitable for use in the laboratory, at the production bench, and in electrical maintenance. Inquiries may be addressed to Walker-Jimieson, Inc., 311 S. Western Avenue, Chicago 12, Illinois.



3-Core Solder

Tri-Core, the solder with three independently filled cores of pure rosin flux is a new development of Alpha Metals, Inc., Brooklyn, N. Y. This new product offers users faster soldering and elimination of dry joints, in addition to substantial savings in tin.

The arrangement of the three cores places them closer to the surface. Since the walls are thinner than those of single core solder, not alone does the solder melt more quickly, but the heat penetrates to the flux more rapidly, allowing it to flow freely and reach the work ahead of the molten solder. Careful cross-sectional proportioning and the absence of surface seams prevent premature sweating out of the flux, making it clean to handle at all times.

The solder exceeds A.S.T.M. Class A specifications and is available in all alloys, all flux percentages and all gauges. Bulletins and engineering test samples are available from Solder Development Division, Alpha Metals, Inc., 369 Hudson Ave., Brooklyn 1, N. Y.

Dial Belt Display

The new G-C Dial Belt Display-Merchandiser carries individually packed dial belts prominently displayed in a counter rack and provides instant selection of any of the 96 various types. For the service man who is in doubt of the exact type of dial belt he requires, a handy reference locator is furnished, which quickly gives the necessary information.

Printed on the front of the display is a convenient price list, a woven belt

[*see page* 64]

In Trade

[*from page 63*]

scale and instructions for measuring belts. General Cement Mfg. Co., Rockford, Illinois.

Adapters for Miniature Tubes

An additional line of Sockette radio tube adapters to be used with miniature tubes has just been announced by the JFD Manufacturing Co., 4117 Ft. Hamilton Parkway, Brooklyn, N. Y. This allows the substitution of available miniature tubes for hard-to-get or unobtainable tubes.

Large quantities of the miniature or peanut tube types are available now, while the popular standard types are very scarce. Since these miniature tubes have the characteristics of the hard-to-get tubes, the firm has designed some thirty-five adapter types which will permit the substitution for tubes like 50L6, 35Z5, 12SA7, and almost all other popular types.

If You Require Tube Type	Use Released Tube Type	Sockette Adapter
1B4	1LA6, 1LC6	482AR
1B4	1E5	484A
1C6	1LA6, 1LC6	480AR
1C7	1LA6, 1LC6	479AR
1E5	1B4	483A
1E5	1LA6, 1LC6	481AR
12B8	9002, 9003	475AD
12Z3/1V	1626	439AR
12Z3/1V	1644	440AR
25A7	1633	437AR
25AC5	1644	446AR
25Z6	1633	438AR
32L7	1633	437AR
32L7	6SL7	444AR
43	41	442AR
43	6K6	477AR
45	1619	443A**
47	3S4	476AG
47	1619	441A
57	2B7	474A
70L7	35W4, 50B5	478AD
70L7	1633	445AR

It is pointed out by Mr. J. Finkel, president of the company, that the tube shortage will exist for some time, so that the availability of the miniature tubes plus these new adapters should prove most helpful to radio parts jobbers and servicemen. Complete information may be obtained from the company by asking for Adapter Form #502.

Portable Radio-Record Player

A really portable, lightweight radio-record played combination is the Sky-Weight featherweight Model 82, weighs only ten pounds, by Continental Electronics, Ltd., 81 Pine Street, New York 5, N. Y. It is cased in attractive

[*see page 66*]

INTERMITTENTS

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infra red lamp may be used by placing a metal shield over the lamp and having a small hole in the center to allow only a small beam to be projected. In this way the beam may be focused on one part at a time until it opens. If cooling is needed to open the unit, dry ice if available will be found excellent to reduce the temperature of a suspected part by merely placing a chunk of it on the unit under test.

Uses Infra Red Lamp

The infra red lamp is also invaluable in drying radios that have been subjected to dampness. Moisture in a radio reduces the gain of R. F. and I. F. stages by losses due to poor insulation. The moisture is absorbed by the coil form and the insulation of the wire and other parts. The inductance and capacity of the circuit is also affected and in some cases it would be impossible to align the I. F.'s to the proper frequency. Losses of this type are difficult to diagnose as a small amount will occur in each stage; the over-all gain will be attributed to any one circuit. This trouble is usually neglected by the service dealer and a poor repair job is the result.

Where auto radios have been out of commission for a period of two months or more I find it advisable to dry out the chassis by means of the infra red lamp. Care should be taken not to place the lamp too close to the radio as it will cause the wax on condensers and wax impregnations of coils to melt. It is recommended that the lamp be placed just close enough to cause the wax to become soft. Move the lamp or chassis occasionally so that the drying rays will reach all parts of the radio. One or two hours will be found sufficient in most cases.

After the drying operation is completed allow the chassis to cool to normal room temperature, then realign, as this will be found necessary in most cases where moisture had been present. Also remember that you can and should charge for the above drying operation. The charge will be readily approved by the customer if you take time to explain that moisture is one of the great enemies of radio and that drying will help prevent future troubles.

Getting Paid

On these intermittent jobs, I usually explain briefly to the customer the difficulty in locating the trouble and at-

[*see page 68*]

In Trade

[*from page* 64]

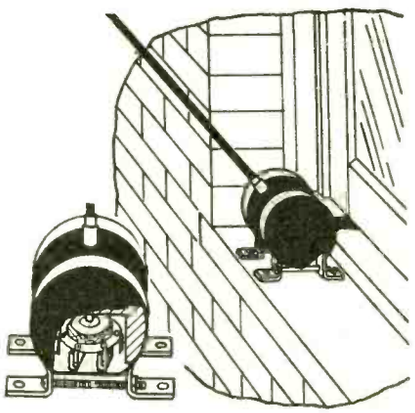
leather-bound luggage, and looks like a handsome traveling case. Safety locks, reinforced case and concealed speaker grill add to its strength and durability.

The Sky-Weight includes a lightweight pickup and tone arm, "Alnico V" speaker, quiet Ballentine motor. Plays 10" and 12" records; uses any standard needle.

The Model 81 record player weighs just under ten pounds, also encased in fine luggage. Has full range tone and volume control. Both are 5½" high, 11½" deep and 15½" wide.

Antenna Kit

An antenna kit for communications, broadcast and short wave receivers is announced by Vertrod Corp., 60 E. 42nd Street, New York 17, N. Y. The antenna, Model 103, consists of a 3-section, 9-foot hard aluminum mast mounted on a patented rotary base. Base rotates easily in two mounting brackets in an arc of 180 deg. This permits aerial to be mounted erect on any surface having 4 inches of space for the base. Inside base is an hermetically sealed transformer to match the impedance of the rod to the transmission cable (see cut). The radio



set coupler, another transformer sealed in a plastic shell, matches the impedance of the transmission cable to that of the radio receiver input. This forms a completely balanced transmission system capable of piping RF signals 500 KC to 30 MC. "No poles, no insulators, no climbing, no hanging aerial wires," is the way the manufacturer sums up this product. Shipping weight 5 lbs.

Ohmite Bulletin

Bulletin No. 126, just issued by Ohmite Manufacturing Company, gives detailed information on the complete

[*see page* 68]

Dealers Merchandise Discs

[from page 60]

Stores in the Peoples chain are located in Auburn, Chehalis, Olympia, Bremerton, Yakima and Ellensburg, all in Washington. Two additional stores with the same self-selection layout are to be added within a few weeks.

Merchandises Singles

The Cochran Music Company with record shops in Kansas City and Indianapolis, Missouri, has just recently re-done the interiors of both stores to give special emphasis to merchandising of single records. Single records are stored in open, upright bins and classified by title to encourage shopper selection. Fast moving items of current interest are ready at hand in boxed sections on the counter. Albums are displayed and merchandised by self-service racks. Both stores are finished in light wood and pastel colors, and equipped with fluorescent lighting.

Open Floor Plan

Spaciousness is the keynote of the remodeled quarters of the Music Mart in Kansas City, Missouri. Believing that the intent record browser likes to roam around undisturbed, Manager Oma Miller drew up a floor plan allowing a maximum of unbroken floor space. Self-selection merchandising fixtures are placed along the walls adding to the roomy effect. Another unusual feature of the Music Mart is a huge title board above the sales counter so that shoppers may review the latest hits from any point in the store. Booths and stock aisles are neon lighted.

Detroit Dealers in Promotion

The appearance of Vaughn Monroe at the Michigan Theatre in Detroit recently occasioned one of the most complete and widely participated in record promotions in dealer memory of the city.

To spark the promotion, 200 window streamers were supplied to dealers by the local RCA Victor distributor. These streamers announced the bandleader's theatre engagement and availability of latest hits in dealer shops. Portrait prints of the artist as well as jumbo cardboard backgrounds, adaptable to future Monroe tie-ins were included in promotional material offered. Detroit dealers, Ernst Kern Company and Grinnell Brothers arranged for a Monroe record autographing appearance in their stores. The stunts brought capacity crowds and sharp up-grade in record sales.

In Trade

[*from page* 66]

line of Ohmite Riteohm ½ watt and 1 watt non-inductive, pie-wound ±1% Precision Resistors.

For a copy write to the company, 4835 W. Flournoy St., Chicago 44, Illinois.

Sprague Interference Filters

Filterol Radio Interference Filters recently announced by the Sprague Products Company, North Adams, Mass., are a peacetime outgrowth of wartime engineering research that resulted in outstandingly successful reduction of man-made radio noises on a wide variety of equipment. They are small, completely self-contained units and are applicable to any electrical device within their ratings.

Designed for installation in series with the power line or interfering device, Filterols should be mounted on the frame of the device or in a grounded junction box as close to it as possible. Their basic circuit is a three terminal network of which the can is one terminal. Four available types include 115 volts A.C. or D.C. ratings from 1 to 35 amperes, and one unit for 220 Volts A.C. or D.C. is rated at 20 amperes.

Complete details as to construction, installation and performance of the filters are contained in the new catalog. A copy will gladly be sent on request to the company at North Adams, Mass.

INTERMITTENTS

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tempt to have him agree to a fifty-fifty guarantee on the job. In this way I charge him the usual price for a condenser or whatever is installed. Instead of making the price higher, I guarantee the job on a fifty-fifty basis.

On the jobs where I fail to locate the defective part, or where intermittent trouble occurs in more than one place, the complaint is rectified and one-half the usual price is charged when the set is brought back.

I dislike working for nothing and in this way I get paid for call-backs. Even though it is not full price, it at least pays for my time and expense and nearly all of the customers are thoroughly satisfied to pay this charge and at the same time makes them realize the difficulty encountered on some intermittents. There is no sure fire method to locate intermittents and I don't think there ever will be.

ADDRESS CHANGES—

Subscribers to RSD should notify our Circulation Dept. at least 3 weeks in advance regarding any change in address. The Post Office Dept. does not forward magazines sent to a wrong address unless you pay additional postage. We cannot duplicate copies of RSD sent to your old address.

RSD Circulation Dept.

Cowan Publishing Co.
342 Madison Ave., New York 17, N. Y.

TUBE TESTING

[*from page* 35]

to gas will add 10 volts extra bias and when the tube operates with only 15 volts normal bias something is bound to happen. The only positive way of determining excessive gas is by measuring the grid current by means of a microammeter in the grid circuit. (*Fig. 7.*) The cost of incorporating this expense in a commercial design is hard to justify.

Noise Tests

Noise test would be desirable but can be accomplished only by placing the tube in a high gain amplifier; such a test involves a multiplicity of circuits adaptable to the many different types of tubes. Here again the benefits do not warrant the expense involved for a commercial design.

With all of the previously mentioned tests available in one form or another, in spite of everything, do tube testers continue to give undependable readings? A carefully designed emission tube tester will pick up about 90 per cent of the tube failures. A mutual conductance test may pick up an additional 2 or 3 per cent. What about the remainder?

As an example a 35Z5 tube was found in a receiver delivering only 50 volts while a new tube delivered the rated 118 volts. There was no argument about what kind of a tube tester to use because rectifiers have no mutual conductance rating and only emission tests can be made. Tests on four different commercial types of tube testers showed the tube good. Careful analysis in a laboratory tester showed it would deliver up to 50 ma OK but no more regardless of load imposed; since the receiver required 70 ma for proper performance the tube failed. The same tube placed in a small receiver having a normal total current consumption of 55 ma worked very well. Thus, the usability of a tube depends to a great extent upon the circuit requirements of the equipment in which it is used.

Some manufacturers with minimum engineering facilities throw receivers together using circuit conditions which are abnormal or borderline. A tube used in such a set may be very critical and some manufacturers' tubes may not work at all.

Again tubes may perform perfectly at normal broadcast frequencies but when used at HF on short wave bands will fail completely. This will be more

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TUBE TESTING

[from page 69]

prevalent with the widespread use of FM and television.

Tubes used in high resistance circuits particularly, AVC and Diode detectors, may develop slight leakage. The internal resistance is insufficient to cause indications in the neon lamp type of short circuit tester which is usually limited to a sensitivity of 50,000 or 100,000 ohms. A partial solution to this problem may be for manufacturers to supply two sensitivities in their short test circuits. Existing tests may be modified by inserting a switch to open up the shunt resistor on the neon lamp. (*Fig. 8.*)

Open elements cause trouble and unless the tube checker has a means for isolating each element such tubes may not be detected. Even in a mutual conductance test an open screen or suppressor grid may not cause enough reduction in reading to be suspected.

Oscillator-Mixer Tubes

Last of all we come to the worst "fly in the ointment"—oscillator and oscillator-mixer tubes. Way back at the beginning of this article mention was made of translation conductance as a specific measurable characteristic. No commercial tube tester has facilities for such measurements. Furthermore, regardless of all the standard tests, no one can be sure a tube will oscillate unless it is actually placed in the circuit where it is supposed to oscillate. Once again some tubes will oscillate splendidly at low frequencies and go dead as a door nail on a short wave band.

Now comes the question, "What tube tester shall I buy?" The answer is, "Buy the one that suits your requirements best!" If you are a tube dealer with non-technical sales help, buy one with good eye appeal yet simple to operate; forget the technicalities and remember that it won't catch all the bad tubes.

If you are a serviceman or industrial maintenance man, you may want more complicated designs with the hope that you will catch a few more bad tubes, but you still won't get them all.

If you are an engineer or laboratory technician you may want to go all the way and buy a lab type mutual conductance job with a meter in each circuit or a vacuum tube bridge but remember you still won't have all the answers; that just isn't possible with three or four hundred tube types and

[see page 71]

TUBE TESTING

[*from page* 70]

thousands of different circuit conditions to contend with.

Above all remember that each type of commercial tube tester is designed to test only one characteristic of each tube, so when you encounter a bad tube which tests good don't think you have the world's worst tube tester. It may test bad in your friend's tester but next week your friend will encounter a different tube fault that will boomerang on his rig.

As a further guide to the proper selection of tube testing equipment, detailed descriptions of commercial tube testing equipment will follow in the next article.

G.I.s Want Radio Shops

Among approximately 225 letters received weekly by the Commerce Department from service men interested in new business, G.I.s planning to open radio or electrical shops lead the list. Other principal business interests in order of their interest are restaurants, filling stations, apparel stores, groceries, real estate and insurance offices.

SHOP NOTES

[*from page* 62]

Radiorgan control panels of 1942 models become loose, tap lightly inward on the escutcheon plate at the points where the OUTER STATIONARY LUGS of the control panels engage the escutcheon. Bend in a little at a time trying the fit, until the panels again seat firmly.

3. To prevent the Radiorgan panel from dangling over and scratching the dial scale when the chassis is placed on end for servicing, clip the panel to a nearby tube by means of a heavy rubber band.

4. 6E5 tubes may be substituted for scarce 6U5 tubes in Zenith and other receivers by installing a grid voltage divider as shown in diagram. This is easily accomplished by use of a two lug wiring terminal strip, mounted near an AVC connection. Mount one resistor on the strip and use the other resistor to make the connection to the AVC bus. Some Zenith models have the 6U5 cathode connected to chassis, thus applying a small fixed bias voltage to the 6U5 grid. This results in a partial closing of the shadow angle even with no signal. Connecting the 6U5 or 6E5 cathode to the 6H6 cathode will remove this bias and restore normal action.

Radio Ralph, Ind.

Ad Index

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MINERVA CORPORATION OF AMERICA

presents

The Radio of the Year

MCA MINERVA

During the war the Minerva Corporation of America produced radios exclusively for the armed forces and organizations working in the interest of servicemen. The reputation of the Minerva radio as a "performer" has become world famous. Now, the same critical engineering . . . the same excellent performance . . . goes into every Minerva Radio now being built for the general public.

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Models W710 and W711

Six Tube AC-DC Superheterodynes

Model W710 — Truly an outstanding achievement in design and performance. • Large Hand Rubbed Walnut Cabinet (15½" long, 9½" high, 8½" wide) • Full Sized Chassis • Gyro-drive Tuning Control (Effortless Station Selector) • "Acousti-grille" Speaker Baffle • Continually Variable Range Tone Compensator • "Accura-tone" Six-inch Permanent Magnet Speaker • High Sensitivity with no objectionable hum.

Model W711 — (illustrated). Similar to W710 except 2 shortwave bands.

The MINERVA "Portabout"

Eight multi-purpose tubes in a super-sensitive superheterodyne circuit receives standard broadcasts anywhere. Operates on batteries, AC or DC currents.

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Minerva Radios scheduled for production include Television, F.M., Combinations, Consoles and Corolin Table Models.

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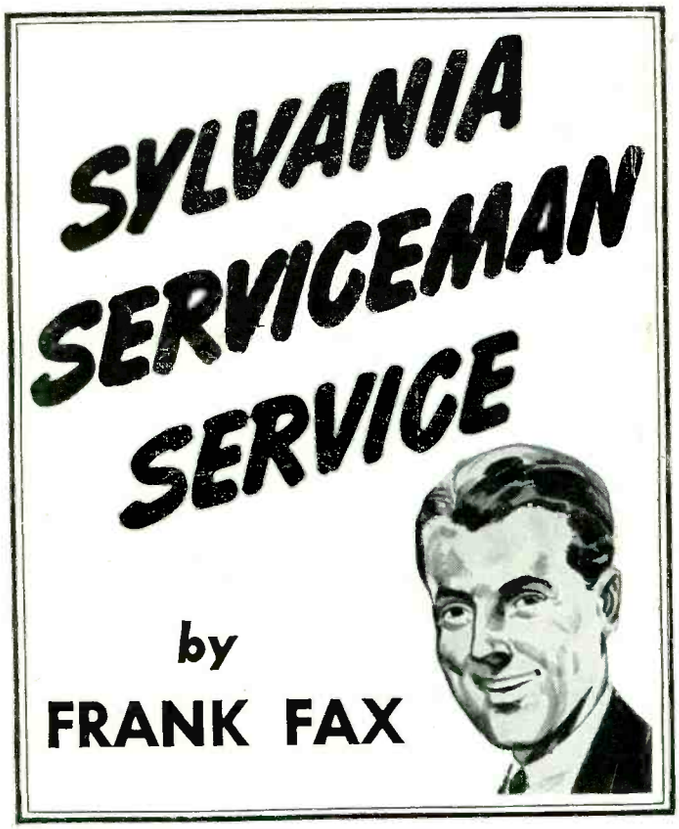
RADIO SERVICE EDITION

APRIL *Prepared by* SYLVANIA ELECTRIC PRODUCTS INC., Emporium, Pa. 1946



RADIO SERVICE MAGIC

The trick is to find yourself on top of the world. happy, successful—enjoying increased profits as well as the good-will of your community.

Also—to be accepted as *the* expert in your field, have a host of satisfied customers, a fast-growing business that will *keep* you on top of the world.

HERE'S HOW IT'S DONE

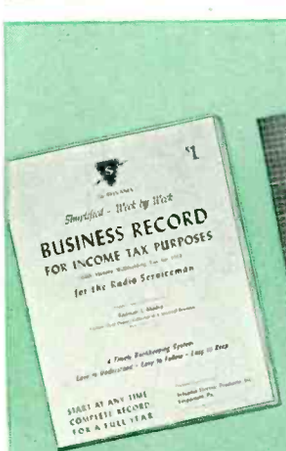
This *radio service magic* is done with Sylvania national advertising—pages of it—that builds goodwill and does a lot of selling for you.

It's done with impartial, Sylvania coast-to-coast surveys that find interesting facts about the radio market, tell you what the public wants.

It's done with valuable business and technical aids for the radio serviceman—finger-tip data to help streamline your business, assure accurate servicing.

And for the *final touch:* Sylvania's *complete* line of receiving tubes. They mean satisfied service customers—the best source for bigger profits.

Your Sylvania Electric distributor has these famous tubes, plus a long list of aids to your business. Let him tell you more about this Sylvania *magic,* and the wonders it will do for you.



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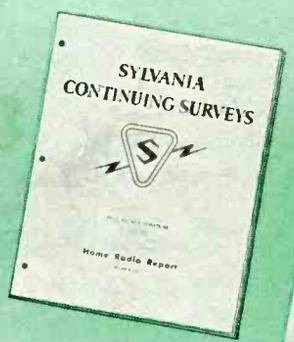
SALES-ASSURING RADIO TUBES



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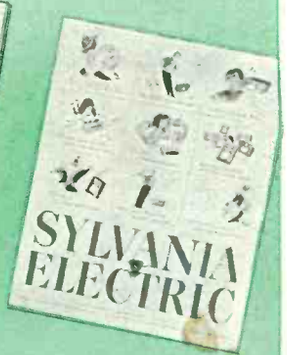

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