

RADIO RETAILING

INCLUDING
SERVICE
AND
INSTALLATION
SECTION

HOME ENTERTAINMENT MERCHANDISING

McGraw-Hill Publishing Company, Inc.

25 Cents per Copy



The RCA Victor auto radios, built on the famous "Magic Brain" principle, feature the ignition noise-filter—a great RCA Victor achievement which makes spark plug suppressors

unnecessary on most modern cars. Also, these superb new auto radios are equipped with the "POWERTRON"—which provides extra-tube performance.



Why dealers are excited about "Magic Brain" Auto Radio

Sales and profits make any dealer excited! And RCA Victor "Magic Brain" Auto Radios certainly put zip into summer sales and profits! Here's the most complete line of Auto Radios on the market... a "sell-up"

line... for every car and every purse... from \$44.95 to \$74.95 F. O. B., Camden, N. J. ... and every model has four remarkable sales features. You'll be just as excited about them as dealers everywhere. Write us today.

THE BIG SALES FEATURES

- 1—The "MAGIC BRAIN" on the road! RCA Victor auto radios employ the "Magic Brain" principle—the famous engineering principle that revolutionized home radio reception!
- 2—The handsome STREAMLINE CONTROL UNIT which harmonizes with beautiful modern car interiors.
- 3—The "POWERTRON"—which provides *extra-tube* reception.
- 4—The IGNITION NOISE-FILTER—which makes spark plug suppressors unnecessary in most modern cars.

THE AMAZING "SELL-UP" LINE

M-101—New single unit, 9 $\frac{1}{8}$ " w., 9" h., 6 $\frac{3}{4}$ " d. with 6" dynamic speaker. Uses "POWERTRON" for *extra-tube* reception, ignition noise-filter, and streamline control unit. A leader at **\$44.95**

M-104—Single unit, 9 $\frac{1}{8}$ " w., 9" h., 6 $\frac{3}{4}$ " d. Two point speech control. Finer tone. Has "POWERTRON" for *extra-tube* reception, streamline control unit, and ignition noise-filter. An easy "sell-up" at **\$49.95**

M-108—New two-unit "Magic Brain" auto radio. Receiver case 9 $\frac{1}{2}$ " w., 6 $\frac{1}{4}$ " h., 6 $\frac{3}{8}$ " d.; speaker case 9" diameter, 3 $\frac{1}{4}$ " deep. Uses "POWERTRON" for *extra-tube* reception, ignition noise-filter, streamline control unit, two point speech control. An outstanding value for two-unit auto radios at **\$57.95**

M-109—RCA Victor's new De Luxe "Magic Brain" auto radio. Receiver case 7 $\frac{3}{8}$ " w., 6 $\frac{1}{8}$ " h., 5 $\frac{1}{2}$ " d.; 8" speaker in separate case: 8 $\frac{3}{8}$ " w., 8 $\frac{3}{8}$ " h., 5 $\frac{1}{2}$ " d. Complete with "POWERTRON" for *extra-tube* reception, ignition noise-filter, streamline control unit, class B amplification—6 watts output. The finest auto radio that RCA Victor ever built **\$74.95**

NEW DI-POLE AUTO ANTENNA

The new steel topped bodies require an under-car antenna. RCA Victor's answer is the new folded di-pole, designed on the same principles as those used in transoceanic service. It has 96", folded to 48" over-all, of effective length. Clamped under the running board, it provides real signal pick-up. Low priced, easily installed.

RCA Victor auto radios from \$39.95 to \$74.95. All prices F. O. B. Camden, New Jersey, and subject to change without notice.



RCA VICTOR

RCA VICTOR, A UNIT OF RADIO CORPORATION OF AMERICA... THE WORLD'S LARGEST RADIO ORGANIZATION. OTHER UNITS: NATIONAL BROADCASTING CO., INC. ... E. C. A. COMMUNICATIONS, INC. ... RCA RADIOTRON... RADIOMARINE CORPORATION OF AMERICA

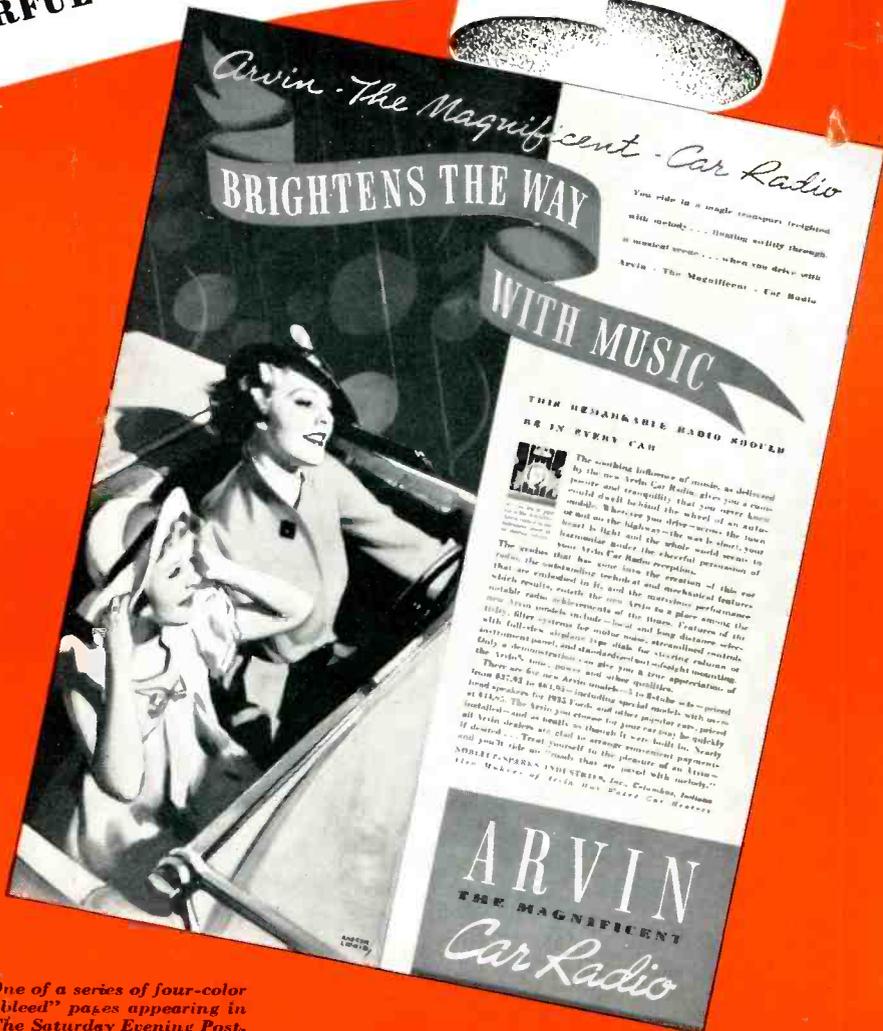
SELLING SUPPORT

AS COMPLETE AND POWERFUL AS THE NEW ARVIN MODELS

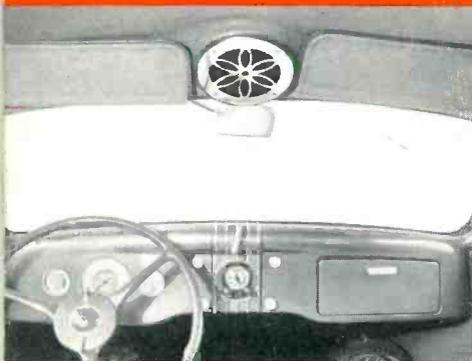
Your "Sweetest Opportunity" to Profit on Car Radio . . .

● Beautiful, full-color "bleed" pages in *The Saturday Evening Post* are telling your prospects about Arvin—the magnificent performing car radio which is now available in six fine, new models, five to eight-tube sets, priced for you to sell from \$37.95 to \$64.95. And with all this, Arvin gives you an all-inclusive line-up of selling helps to link you up with the most impressive consumer advertising campaign on car radio. A wide variety of effective displays—tie-up newspaper advertisements—mailing cards—circulars—a complete sales manual—and big poster reproductions of the beautiful four-color *Post* pages—in fact, everything is ready for you to cash in on your "sweetest opportunity" to profit on car radio. See your jobber now for full information on complete Arvin Car Radio line and the business-building program behind it.

NOBLITT-SPARKS INDUSTRIES, Inc., Columbus, Indiana
ALSO MAKERS OF ARVIN HOT WATER CAR HEATERS

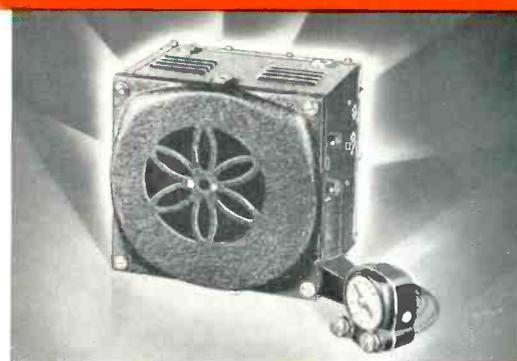


One of a series of four-color "bleed" pages appearing in *The Saturday Evening Post*.



THESE SPECIAL ARVIN MODELS

COMPLETE THE LINE OF 7 FINE SETS PRICED FROM \$37.95 TO \$64.95



New Arvin Special Model 17-A
Tailor-Made for 1935 Fords. Powerful 6-tube superheterodyne. Overhead speaker mounts above the windshield. Airplane-type dial clamps in ash tray opening and matches the instrument panel perfectly. All new Arvins fit beautifully in 1935 Fords—but this model is custom-built for them. . . . **\$44.95** list
Models 17-B and 17-C with overhead speaker and custom-built panel control for Chevrolet, Oldsmobile, Pontiac, Plymouth, Dodge, Chrysler. \$45.95

ARVIN

THE MAGNIFICENT

Car Radio

New Arvin Special Model 7
For All Makes of Cars. 5-tube superheterodyne with airplane-type remote control for steering column or instrument panel and the many distinctive Arvin features that simplify installation and service. The car radio to sell those who want the magnificent performance of an Arvin at the lowest possible price. . . . **\$37.95** list

Other new Arvin models for all cars:
Model 17 with 6 tubes List \$44.95
Model 27 with 7 tubes List \$54.95
Model 37 with 8 tubes List \$64.95

3 NEW AUTO RADIOS

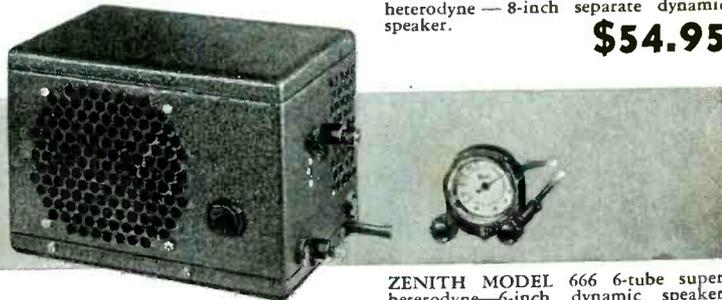
by **ZENITH**

to give the prospect the price and performance he wants

- 1— SUPPRESSORS UNNECESSARY
- 2— TRIPLE FILTERING
- 3— WIDE PRICE RANGE
- 4— EASILY INSTALLED
- 5— FAMOUS NAME



ZENITH MODEL 668 6-tube superheterodyne—8-inch separate dynamic speaker. **\$54.95**

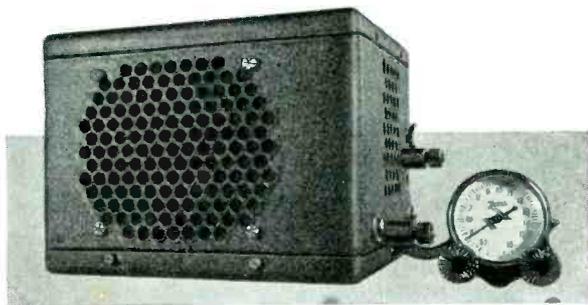


ZENITH MODEL 666 6-tube superheterodyne—6-inch dynamic speaker. **\$49.95**

Investigate!

Get together with your distributor. Look into the new Zenith Automobile Radio Models. Performance that's startling—Triple Filtering—protection against outside noises—ignition—power lines—electric cars, etc. Least possible drain on batteries—no special parts required—no suppressors. Installs with ease and speed. An "Auto Radio" worthy of the Zenith name. Write your distributor for full detail.

Prices slightly higher west of Rockies (subject to change without notice)



ZENITH MODEL 664 5-tube superheterodyne—6-inch dynamic speaker. **\$39.95**
f.o.b. factory



ZENITH RADIO CORPORATION, 3620 Iron St., Chicago, Ill.

TEAR OUT NOW—MAIL LATER

ZENITH RADIO CORPORATION
3620 Iron Street, Chicago, Illinois
Gentlemen: Please send complete details on your three new Zenith Auto Radios.

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

Better performance than any other
Stromberg-Carlson under \$400!



\$187.50
(East of Rockies)

The NEW No. 82 ALL-WAVE

FEATURES

FOUR TUNING RANGES covering frequencies from 520 to 23,000 kc.

SELECTORLITE DIAL automatically indicates and illuminates the tuning band in use.

VISUAL TUNING METER shows exact tuning point and comparative signal strength of stations.

COMPLETE INDEPENDENT SETS OF TUNING COILS give same high sensitivity on all wave lengths. Idle coils are grounded.

AUTOMATIC ANTENNA SWITCH selects proper aerial for broadcast or short wave reception.

15-WATT CLASS "A" POWER OUTPUT for a wealth of pure Natural Tone volume, without distortion.

LOW-LEVEL TONE COMPENSATION keeps bass, treble and middle register tones in balance even at whisper volume level.

Yes—actually better performance than any previous Stromberg-Carlson under \$400—and in addition it is an All-Wave—housed in a large, luxurious cabinet.

An amateur, using this new No. 82 for the first time, actually brought in 73 foreign stations *at room volume*. He tuned in a distant weak station operating on the very next channel to a 50,000-watt station in his own city, without the slightest interference.

The cabinet combines size and beauty. Particularly attractive is the band of horizontally grained walnut which crosses the vertically grained sides and wings. The instrument panel is of walnut swirl, top and sides striped walnut. Height, 41½ in; Width 27½ in; Depth, 15½ in. A radio that will crowd the old set out of the house.

Stromberg-Carlsons are priced from \$69.50 to \$985 (East of Rockies).

STROMBERG-CARLSON TELEPHONE MFG. CO., ROCHESTER, N. Y.

Stromberg-Carlson

RADIO RETAILING. May, 1935. Vol. 20, No. 5. Published monthly, price 25c. copy. Subscription rates—United States and Central and South American countries, \$2.00 a year. Canada, including duty, \$2.50 a year. All other countries \$3.00 a year or 12 shillings. Entered as second-class matter April 10, 1925, at Post Office at New York, N. Y., under the Act of March 3rd, 1879. Printed in U. S. A. Cable address "McGrawhill, New York." Member of A.B.P. Member of A.B.C. Copyright 1935 by McGraw-Hill Publishing Co., Inc., 330 West 42d Street, New York, N. Y. Printed by The Schweinler Press, N. Y.

ONLY ONE CAR-RADIO offers this combination



MODEL 524—(above) 9-tube performance with 5 high efficiency tubes **\$4395**

MODEL 634—10-tube performance with 6 high efficiency tubes **\$4895**

Western Prices slightly higher

CONTROL MOUNTING ON PANEL OR STEERING POST. FOR BOTH MODELS



THE BULL'S EYE DISPLAY STAND

Dealers tell us it's the best car-radio display ever offered. A rich aluminum background... a striking ribbon of red. It's a bull's eye that stops 'em 50 feet away.

ADD UP these features

- Superheterodyne
- Spark Noise Trap
- No Spark Plug Suppressors (in most installations)
- Control Mounting on Panel or Steering Post
- Police-Proven Dependability
- Vibro-Balanced Design (Round for Sound)
- Advanced Anchored Construction
- Six Inch Speaker
- Full Automatic Volume Control
- Volume-Conserving Tone Control (Model 634 only) (Patent Applied For)
- Balanced Sensitivity
- Sensible Selectivity
- Generous Rear-Seat Volume
- Jiffy Cover
- More Foot Room Due to Round Shape

... and you have the largest sum-total of advantages found in any 1935 car-radios.

... ROUND for SOUND ...
NO SPARK PLUG SUPPRESSORS* AND
all these other selling features besides!

FLASH!... American-Bosch Car-Radio sales are already more than double last year. Good reasons why:

1. American-Bosch offers dealers the outstanding car-radio of the year. Outstanding in appearance—it's round—"round for sound!" Outstanding in value—examine the complete list of features at left! And what is most important in clinching a sale: outstanding in tone—have you heard it?
2. American-Bosch offers dealers the outstanding car-radio display stand of the year—the round, arresting bull's eye display that stops 'em 50 feet away!

Hitch your efforts to the Star...sell American-Bosch, the Vibro-Balanced plus-feature Car-Radio. Ask your nearest distributor or wire for literature and complete selling program.

UNITED AMERICAN BOSCH CORP.
Springfield, Mass. New York Chicago Detroit

 The makers of American-Bosch products have always taken pride in creating, designing, building and selling products superior to those commonly in use. Proven leaders in their fields, these products are built up to a high standard of quality and not down to a price. 

*In most installations

AMERICAN-BOSCH 1935 CAR-RADIO



DISTRIBUTION . . . not SATURATION

Tung-Sol Radio Tubes are sold in every important city and in many of the smaller towns. Yet Tung-Sol policy does not permit the type of market saturation which leads to cut-price competition and other similar evils.

The Tung-Sol retail agent is usually the local authority on radio whose expert advice and services are sought. He is not in competition for Tung-Sol Tube sales with other Tung-Sol agents or with retail outlets who are not primarily in the radio business. He is assured full profit on all Tung-Sol sales and benefits further through the time-tested consignment selling plan pioneered by Tung-Sol Radio Tubes, Inc., four years ago.

There are still locations where independent radio dealers and service organizations could qualify as Tung-Sol Retail Partners.

Write for the name of the nearest wholesale agent who will give you details.

TUNG-SOL RADIO TUBES, INC.

Sales Offices:

ATLANTA · BOSTON · CHARLOTTE · CLEVELAND · CHICAGO
DALLAS · DETROIT · KANSAS CITY · LOS ANGELES · NEW YORK

General Office: NEWARK, N. J.

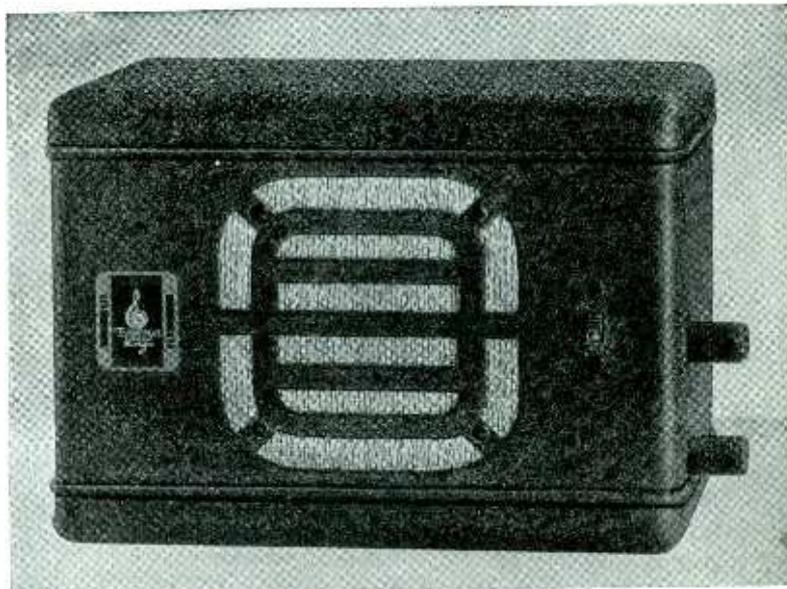
ACHIEVED: True "HOME TONE" in
***Emerson* AUTO Radio**
RESULT: An All-Time Sales Record!



MODEL 6-A SIX TUBE

**No Spark Plug Suppressors Necessary.
 Single Unit Superheterodyne Set.**

Automatic Volume Control . . . Tone Control
 . . . Dynamic Speaker . . . 3-gang Condenser
 . . . Operates on all cars, including "steel tops"
 . . . Low Battery Drain . . . Attractive Black
 Case . . . 3 mounting bolts . . . Remote Control
 may be mounted on steering post, on instrument panel or lower edge of panel. List Price, with Radiotrons, **\$ 44.⁹⁵**

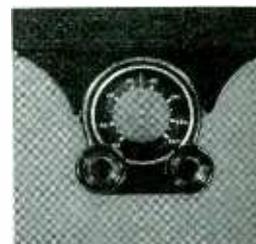


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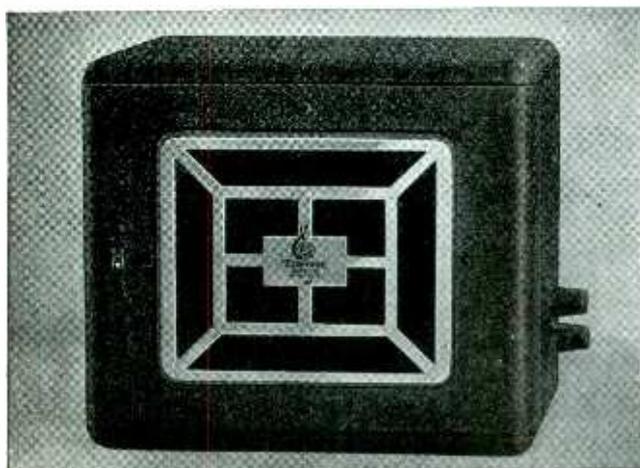
Something sensational has happened in Auto Radio Design. If you compare the "blur," the "fade-out," the "nasal" tones of ordinary sets with the new Emerson Auto Radio, you will quickly see what has been achieved. You will realize what is meant by "HOME TONE" on the road!

If you will examine the Emerson "FORTIFIED CHASSIS"—how it is protected against road shocks, dust, heat, cold, humidity and electrical disturbances—you will understand the WHY of its unflinching performance under all conditions. If you will look at the beautiful modern cases, you will see how easy it is to mount them in all cars—and how accessible they are.

If you will compare the values—if you will write or wire for full details of the Emerson proposition—you will realize WHY Emerson distributors and dealers are selling more and profiting more with these outstanding sets.



Special Mounting Plates for CHOICE OF MOUNTING. Steering Post, on Instrument Panel or Beneath Lower Edge of Panel



De Luxe Model Die Cast Case
New Plug-In Type—Synchronous Vibrator.
Equivalent of Seven-Tube Set. Only
Auto Radio of Its Kind.

No Spark Plug Suppressors Necessary . . . Automatic Volume Control . . . Tone Control . . . 3-Gang Condenser . . . 6-Inch Dynamic Speaker. By all odds, the **FINEST** Auto Radio ever produced. Single-Unit Superheterodyne five-tube set—new plug-in type full-wave **SYNCHRONOUS** Vibrator—equivalent of **SEVEN** Tubes . . . Die-cast case with chromium grille . . . Only two holes required for mounting. Complete with RCA Radiotrons, **\$ 49.⁹⁵**

Special mounting plates for instrument panels can be furnished for such cars as Chrysler, De Soto, Dodge, Plymouth, Ford. Details on request. (Mounting kit and complete instructions accompany each set.)

EMERSON RADIO & PHONOGRAPH CORPORATION, 111 Eighth Ave., NEW YORK, N. Y.
Emerson Line also comprises Models for every foreign market. Cable Address: **EMPHONOCO, N. Y.**

"America *is now* Entertaining!"



With

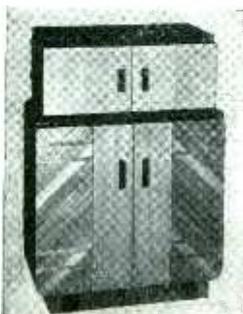
Radiobar

REG. U.S. PAT. OFF.
-AND RADIO DEALERS
ALL OVER AMERICA
ARE "CASHING IN"—

There's a new feeling in the air, and in the retail radio business. The art of entertaining has miraculously changed. RADIOBAR, the world's most unique combination of a quality radio plus a strictly high-class, completely-equipped bar is *making money* for those thousands of alert radio dealers who are today stocking this beautiful, two-in-one cabinet. Many models at retail prices ranging from \$99.50 to \$295.00 (and without radio, but fully bar-equipped, from \$69.50 to \$215.00) are carried in stock at quick delivery points throughout the country. Don't put off this opportunity to increase *your* sales. Write or wire today for complete information.



District Sales Representatives Wanted: Write or wire immediately to General Offices.



Above, Radiobar Model 510, a superbly fashioned Walnut cabinet, completely equipped with 32 glasses in 4 sizes, 6 decanters, cocktail shaker, ice and refuse containers, electric lights and many other bar accessories, together with All-Wave (540 to 23,000 kilocycle) radio receiver; four bands, 11 tubes. LEFT: Radiobar model 523, with bar closed, a beautiful, modernistic cabinet. Just two of the many models available.

Radiobar Company of America

FACTORY AND GENERAL OFFICES

7100 McKinley Avenue,
LOS ANGELES, CALIF.

New York Showrooms: 13 East 47th Street

RADOLEK AMPLIFIERS bring AMPLIFIED PROFITS!

8 WATT
A.C. Operated



—the **HIGHEST GAIN AMPLIFIER** ever made in one unit

RADOLEK'S line of Quality Public Address Equipment covers every P.A. Need. A complete range of Amplifiers from 4 Watts to 60 Watts. Permanent sound systems. Mobile units. Portable systems. Battery operated and AC operated—each one precisely engineered and laboratory built, leaders in their respective class. This complete line is available to you at **LOWEST WHOLESALE PRICES**. Send for RADOLEK'S New P.A. Book—the greatest Catalog of Sound Equipment ever published. Arranged to show List Prices only. Start making money immediately. Send for your copy of this Book—today.

Above is shown the new RADOLEK AC operated, Superior-Quality, Four Stage, High Gain 8 Watt, All-Purpose Amplifier, designed to give **MORE POWER** and **BETTER PERFORMANCE** at **LESS COST**. Has all the New **FEATURES**: Individual Input Volume Controls, Plug-in Input and Output, Complete Mixer and Fader, Tone Control, Provision for either AC or DC Speakers and TWO Input Channels. All built in. No detached controls. Can be used with a Crystal Microphone or Carbon, Dynamic or Velocity Microphone. List Price, \$57.50 Complete with tubes. Standard Dealer discount.

Send for the NEW RADOLEK PROFIT GUIDE!

It's now ready. Not just a catalog, but a Complete, New Radio Encyclopedia—Thousands of items accurately illustrated and clearly described. New charts, diagrams, valuable technical data. This Profit Guide is truly a "Guide" to Bigger Profits—Distribution is limited to active and legitimate Radio-Men. Send your business card or letterhead to be assured of getting your copy immediately.

610 W.
Randolph
Street

THE
RADOLEK
COMPANY

Chicago
Illinois



Higher temperatures are employed in manufacture . . . than are ever reached in use

The very nature of Vitrohm insulation (vitreous enamel) necessitates that the tubes and wires be baked at temperatures high enough to make the glass flow, much higher than temperatures ever reached during use. Furthermore, Vitrohm is acid and moisture resisting and tough. It holds the wires rigidly and protects them from oxidation or mechanical damage.

Ward Leonard Vitrohm Units are made to meet every special requirement for electrical resistance.

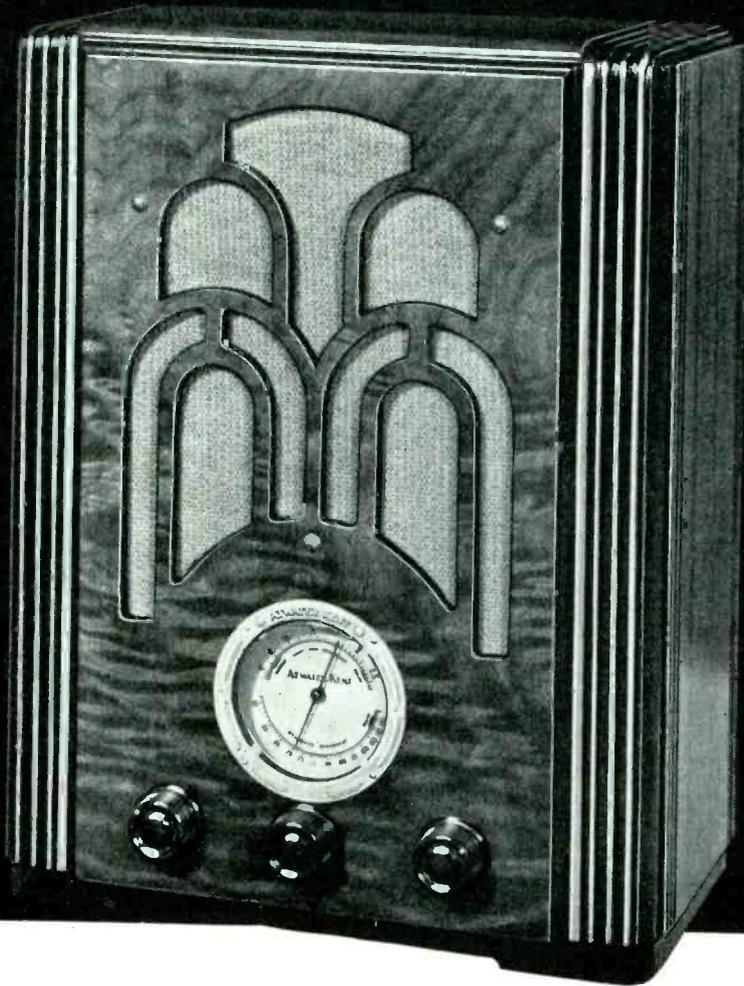
WARD LEONARD RESISTORS

WARD LEONARD ELECTRIC CO.
South St., Mount Vernon, N. Y.

Please send me bulletin featuring Resistors.

Name
Address
City State
Jobber RR

ATWATER KENT RADIO



A FORERUNNER OF 1936

Here is a smart, new radio.

Read the detailed description and we believe you will agree that in this forerunner of the 1936 line, Atwater Kent is offering value never before equalled in all of its many years of quality radio manufacture.

This cabinet design is available in either A. C. or battery operated models.

MODEL 545—FIVE TUBE A. C. COMPACT with short wave and standard broadcast for foreign and domestic programs, police, airplane and amateur calls—six tuned circuits—airplane type illuminated dial—vernier station selector for accurate tuning—full, rich, mellow tone from the over-sized fully proportioned speaker—automatic volume control minimizes blasting and fading and maintains volume **\$39.90** f. o. b. at a predetermined level. . . . factory

MODEL 415 Q—BATTERY OPERATED COMPACT. This same cabinet design is available for "air cell" battery operation. Tuning **\$39.90** less batteries range 540—1712 kilocycles. f. o. b. factory

Prices subject to change without notice.

ATWATER KENT MANUFACTURING COMPANY

A. Atwater Kent, Pres.

PHILADELPHIA, PA.

RADIO RETAILING

RAY V. SUTLIFFE HOWARD EHRLICH H. W. MATEER
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Consulting Editor *Associate Editor* *Assistant Editor*

HARRY PHILLIPS PAUL WOOTON
Art Director *Washington*

MAY 1935

VOL. 20

NO. 5

◆

“A FLOOR mike and a portable amplifier is just as necessary in my business these days as an A-1 sax player. Can’t book college or resort dates without this bit of scenery,” a well known orchestra leader told us the other day.

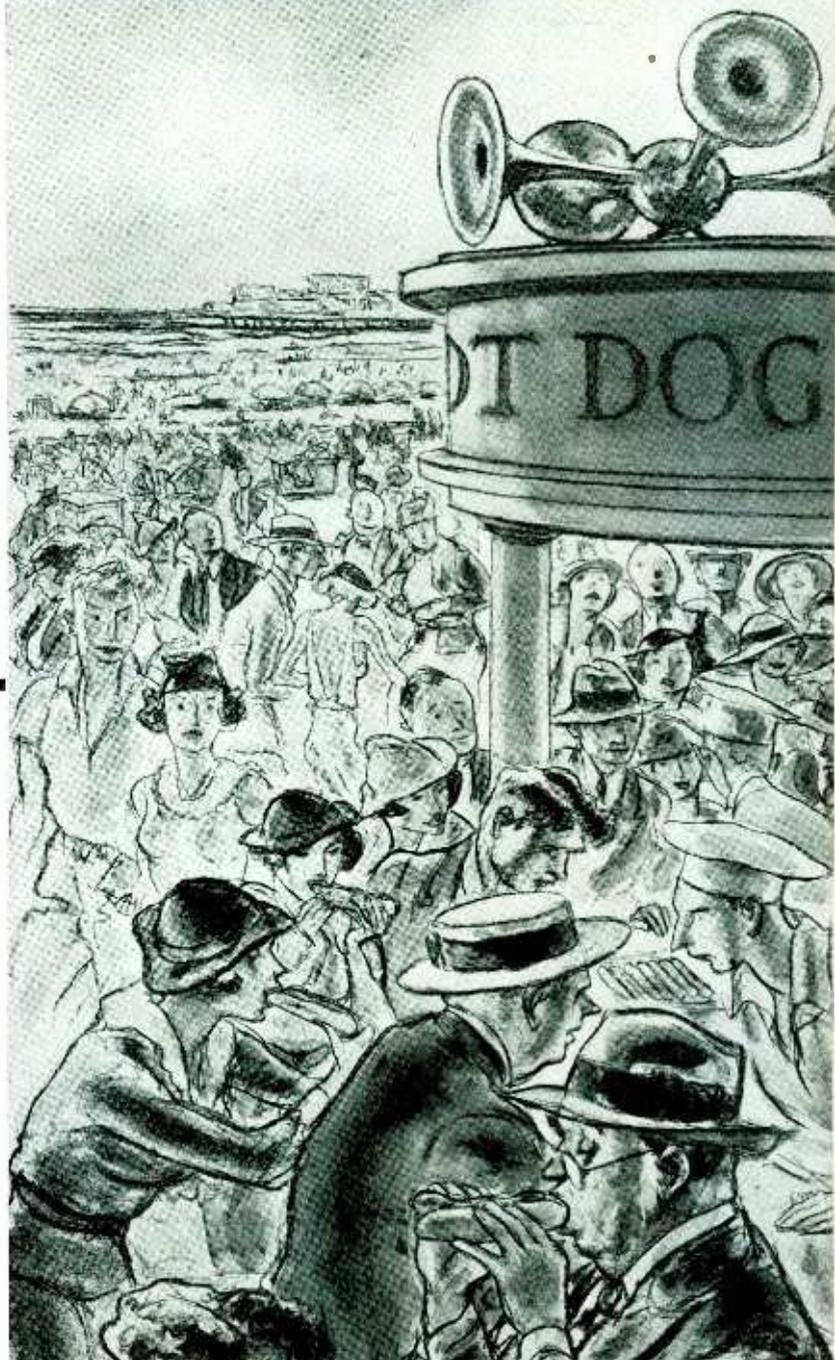
“Have found my new loud speaker call system indispensable,” states “Jack, the Tire Expert,” of Hartford, Connecticut.

Volland’s Radio Salon, Long Beach, Calif., has built a thriving business in P. A. within the past six months—mainly from entertainment and refreshment ventures, newly opened as a result of repeal. “Rentals for store openings and bazaars also offer a wide field for profit,” says this concern.

Decidedly, public address, especially the smaller requirements, has caught on.

Today, P. A. is a necessity, for its psychological effect upon the crowd as well as for its actual utility value. Wherever people gather they demand that they hear clearly what’s going on.

Are you P. A. Headquarters for your territory? If not—now is the right time to get going.



Courtesy of National Broadcasting Company

Wherever
people
assemble

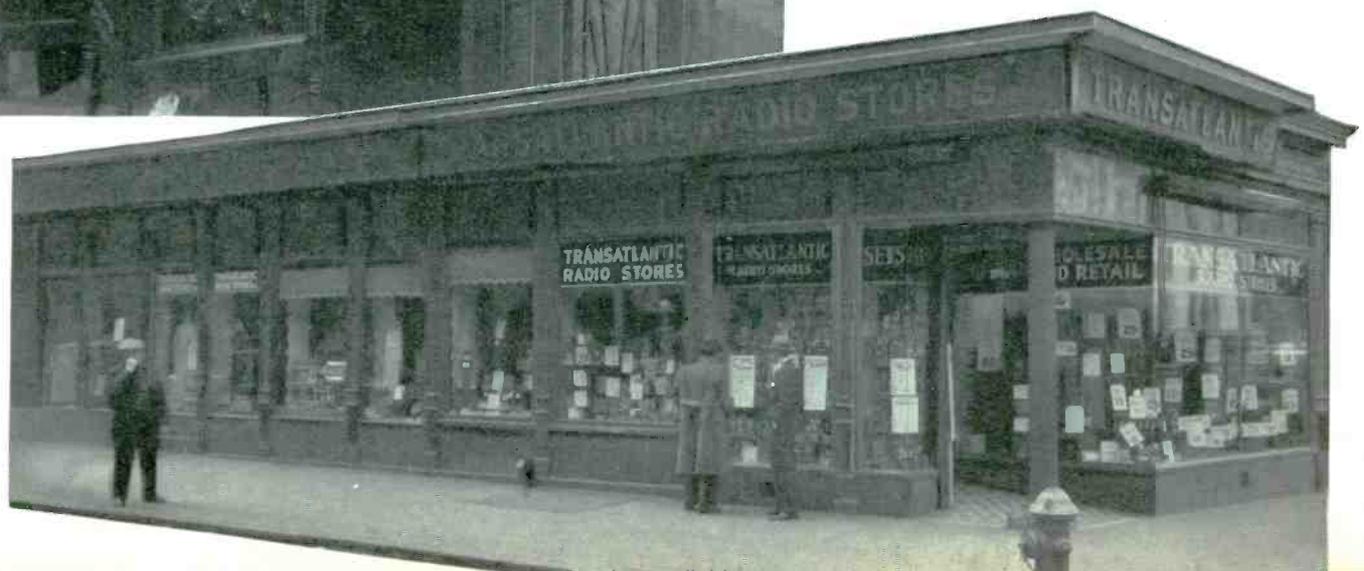


“ In the heart of ”
Competition **R**ow



This Store Sold
10,000 TUBES
at Full List Price

Story on page 22



THAT dealers and servicemen remote from the pressure of cut price competition sell tubes for replacement at full list has been demonstrated many times. That this policy can consistently be maintained, even in the midst of the liveliest of price lure activity, would appear to be proven by the experience of a Cortlandt Street, New York, concern which is reported elsewhere in this issue.

If the manufacturers could be convinced of these facts a long step would be taken toward the return to higher lists on tubes—for which an impressive majority of the retail trade has been clamoring these many months.

If, however, such a move is now impracticable, *Radio Retailing* suggests that the new metal tubes—when and if adopted by a substantial number of manufacturers—will provide an excellent opportunity for a fresh start. This chance should not be neglected.

In the first place, these tubes will be fewer in number and, we hope, there will be fewer “brand” names to contend with. Secondly, these iron-shelled creations will be advertised as better than the glass product. As such they readily could command a higher asking price . . . not less than \$1.50 per tube, and, preferably, all priced at the same figure.

The dealer wants higher prices—and can get them from the public. If the tube magnates cannot bring this to pass in one way then they should reach this objective by the second route.

VALUE RECEIVED

In order to provide servicemen having limited resources with testing devices essential to their business, instrument makers have cut corners to bring down cost. Some have done this willingly. Others have been forced to it by competition.

A case in point is the emission type tube tester. Any good technician knows that such an instrument does not show up all defects. The manufacturers themselves know it. But a good mutual conductance tester is relatively expensive. And an emission test is better than none at all.

Thus there are quality instruments and instruments made at a price. Both have their place. Intelligent servicemen pay *all they can afford* for new test equipment. For in this branch of the business more than in any other, manufacturers give “value received.”

HEADPHONE LISTENING

A return to headphone listening was predicted by Dr. O. H. Caldwell, consulting editor of *Radio Retailing*, in a talk before the Bridgeport (Conn.) Engineers Club. This statement was based, in part, upon the present trend toward several sets in the home. A headphone jack, cutting out the speaker, will permit little Willie to enjoy “Buck Rogers” without disturbing the entire household, Dr. Caldwell explained.

But a broader opportunity awaits a new type of headphone. High fidelity sets with response of from 7,000 to 8,000 cycles also may stimulate headphone listening. In high fidelity reception “standing” waves within the room tend to destroy the higher frequencies or set up an annoying pattern of sound waves. With

the close coupling to the ears obtainable with headphones, high fidelity and clarity are assured.

A new type of aural device, inconspicuous and easy to wear, of wide and flat range, might revive the long dormant headphone industry.

TEMPER YOUR GENEROSITY

One of the major handicaps of the public address business is the loaning of equipment, portable amplifiers and even truck outfits, for their publicity value. This practice, is at times, a profitable one to the loaner and results in the later sale of radio equipment to accommodated civic groups. It can be overdone, nevertheless, to the detriment of the public address business.

Loan equipment where you feel fairly certain that you will get your money back in publicity, sure. But for heaven’s sake don’t give your services away where the probability of getting a return for your labor are remote and the loan puts a crimp in your own or somebody else’s legitimate rental business.

PRICE BY FORMULA

Hazeltine engineers have evolved a formula for determining scientifically the minimum price at which a set should be sold. It involves the total number of electrodes in all tubes, total number of impedances, effective baffle area, power delivered by the output tubes, weights and the average price of speakers.

This “rock-bottom” yardstick is now available for manufacturers’ use. The only fear we have is that after they carefully go through the ritual with a slipstick they will toss the answer out the window and cut sixteen cents below competition anyway.

Public Address City

number 1

WHEN a dainty little waitress calls out your order in a mild soprano voice and it booms back from the kitchen in stentorian tones . . . when you are more or less comfortably ensconced in a hotel lobby and someone starts paging from the ceiling . . . when you see a curb-parked taxicab driver rudely shaken out of his somnolence by a bellow from the blue . . . you are probably in Washington, public address capitol of these occasionally United States.

For speech is a major commodity in The District and public address equipment originally imported to spread it far and wide has crept so insidiously into the life of the people that one practically finds it in one's coffee. No longer confined to politics, public address has won the hearts (and checkbooks) of the clergy, toy stores, airports and just about every other endeavor in town.

Here's a review of the capitol's public address applications, *indicative of what can be done with this merchandise when its virtues are adequately publicized.*

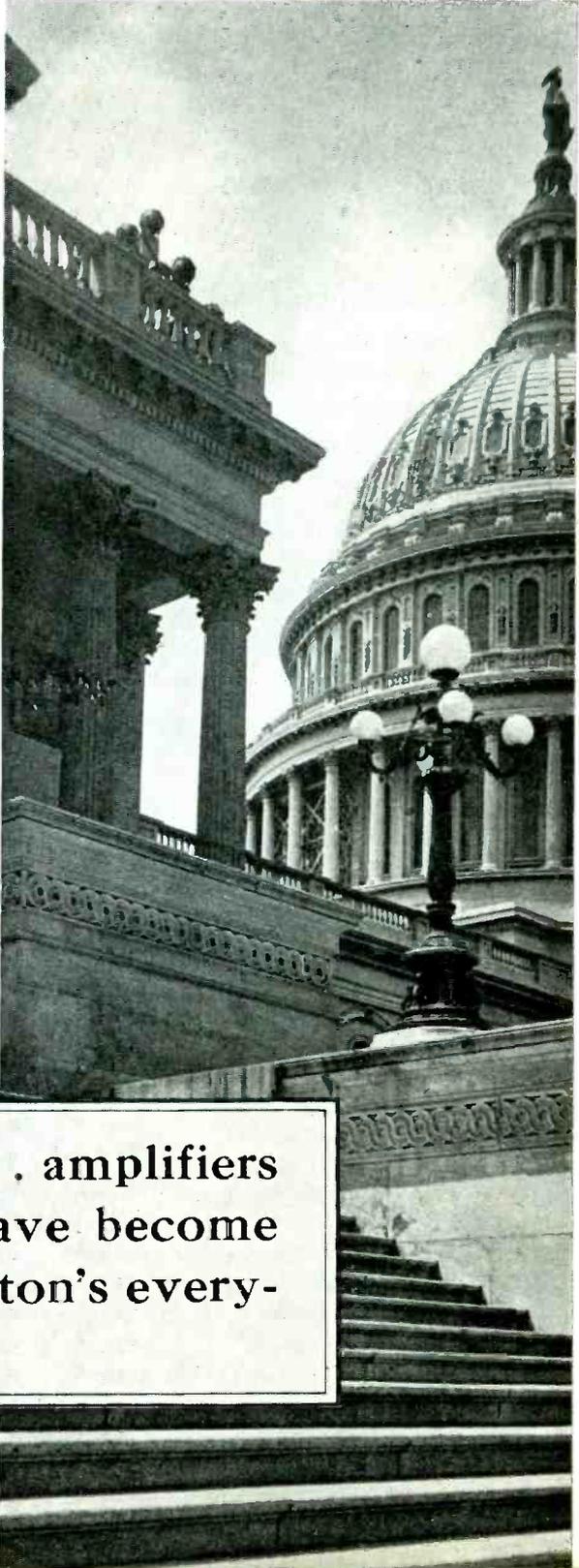
Unusual Uses

One of the most unusual uses of sound equipment is for the paging of taxicabs. The drivers park outside the office at the curb and when a call comes in the switchboard operator sings out the address and name without looking up from her Elinor Glyn.

A coal yard located in a noisy section of the city and generating plenty of racket on its own hook with a nice big tin chute uses a system to call loading tonnage from the inside scale to the outside weighing platform.

A toy store recently played a record of a real train in action, starting up, whistling at crossings and clanging the bell when coming into a station, while demonstrating a toy train outfit in the show window. It scared h— out of a few innocent bystanders but sold some Lionel's. So the proprietor sent it out with the truck and scared motorists up on the sidewalk. He dropped the idea.

A department store hawls out the secret code signal "Number 100" to all and sundry employees when a shoplifter is reported to be on the premises, whereupon they all become amateur Hawkshaws and gumshoe around looking for the culprit. The system works pretty swell, too, when the management is looking for a clerk who has surreptitiously pulled out on the company time for a soda.



**Microphones . . . amplifiers
and speakers have become
part of Washington's every-
day life**

GALLOWAY



A number of hospitals use public address systems and speakers in the main rooms. So if the Old Lady in Ward 66 complains of a tummy-ache in order to get that handsome doctor to hold her hand a nurse phones the main switchboard and the interne is public address-startled out of a comfortable hand of pinochle.

The National Press Club has a permanent installation which permits any guest speaker with a weak falsetto voice to blast his audience's ears back.

Outstanding Installations

One of the technically outstanding installations in Washington is in a restaurant. Four microphones and eight speakers are so placed that waitresses can bawl orders to the distant chef when within 10 feet of any mike. And the chef can answer back if he confuses hash with Salisbury steak.

The S & S Cafeteria has a similar system but with relay controls and pilot lights which permit just the bakeshop, salad, dessert or main kitchen departments to be called from the counter individually. A lighted pilot at each station warns employees that the outfit is in use, avoids conversion of the system into a veritable Tower of Babel.

A public address outfit with a number of low-level speakers and mikes strategically spotted around the caucus room of the Senate Office Building has corrected a nasty acoustic condition caused by marble walls, floor and ceiling. It used to be impossible for a person 12 to 15 feet away to make himself understood. Sometimes it still is . . . but not because of any deficiency in

(Please turn to page 44)

Pichette Sells 80% of Refrigerator Prospects



Because he concentrates on the real ones and lets the others go

JOE PICHETTE of Racine, Wisconsin, one radio dealer who is giving specializing refrigerator shops a run for their money, says his success with "Leonard" is due to a two-point selling policy which fits his operation to perfection.

1. Concentration on a relatively small number of live prospects obtained through store traffic; exhibits and demonstrations at food shows; tips from satisfied customers and—

2. Application of the radio-proven "sell-up" plan to induce customers to buy 6 cu.ft. boxes instead of the low-priced 4's.

Pichette himself ferrets out refrigerator leads by carefully classifying people who come to the store and by handling all outside exhibits personally. Leads are turned over to outside salesmen who never cold-canvass. "I don't care if my men make only one call a day," says the proprietor of the Melody Radio Shop, "so long as they stay with that one prospect until a sale is made or until it is definitely known that no sale is possible.

"Calls may make sales. I know that there are figures which will prove that if enough are made business results. But the lost motion and excessively high canvass-

ing costs are too much for me. Low pressure selling and a thorough job on each and every prospect suits my type of business. We sell about 80 per cent of our prospects and believe we make more net profit on this business than we would with a high-pressure plan

despite the increased volume which the latter produces.

"It has also been our experience that while most prospects lean toward the small 4 cu.ft. boxes because of the low price relatively few are adequately served by these types. We attempt to sell the 6 cu.ft. size wherever possible and have not found it very difficult where there have been more than two people in a family.

"This little stunt alone has kept our refrigerator volume on the up in dollars. Many customers have come back to thank us for selling them a larger box than they had in mind when they first came to the store. And where we have failed to 'sell-up,' believing the larger box necessary, we have frequently had dissatisfied customers. Too little attention is paid to this fact by refrigerator-selling radio dealers. Because within a few years saturation will reduce the number of unit sales, we should sell up right now."

Summer Sales Ideas

and Some Are usable year 'round

Fifteen ways to keep out of trouble during the hot months. Any one of these, worked for all it's worth, should pay the overhead:



1. Foremost, in profit possibilities, is the car-radio field. Today no young man is socially acceptable unless his runabout is radiofied.

2. General business is on the up. Wise dealers will watch factory openings, dividend payments to depositors of defunct banks, new enterprises. New money means new things for the home.

3. Now the roadside stands, the pleasure parks, the seaside resorts are opening up. A market for public address and other types of amplifier equipment as well as radio receivers.

HOT DOGS



4. A dealer friend of ours contacted the secretaries of all local organizations last June-July. Had a special summer price offer and a "limited time" commission fund for the lodge treasury (or the secretary's own pocket) for every lead thus obtained—and sold.

5. Summer time is service time, that's when set troubles show up. Put the service man to work, on new set sales, distributing circulars, getting names of prospects from customers.

6. Specialize on servicing car sets. One dealer advertised: "Car radio tubes are subjected to specially severe strains. Car radios must be in top condition to perform satisfactorily. We check your automobile-set tubes free."

7. A Wyoming dealer concentrated on 110-volt, semi-portables last year. Explained how they would make a good "second" set for the home next winter. Also following uses: With extension cord, can be used for lawn



or porch festivals; may be taken to parties and other places where there is no radio; Junior can tune in his favorite thriller without disturbing the rest of the family's listening habits.

This merchant found that sales doubled when he offered these \$25 outfits on a small weekly payment basis rather than for spot cash.

7. An argument for buying that new set NOW. "Summer reception demands new set efficiency. Therefore you should buy at once—and enjoy summer programs delivered with full winter strength and clarity."



9. You guessed it. A summer survey! Hire a personable young lady to find out what's what in the home radio situation; age of model (if any) and whether Mrs. Jones would like a new one. Summer's the ideal time because of weather conditions.

10. Dealer Ralph Brown substituted prospect quotas for sales quotas last July—and notified his salesmen that their salaries would continue just the same. Result: the greatest fall business ever enjoyed, also the greatest summer sales volume.

11. Making sure all customers are satisfied with the sets purchased last winter, is the way dealer B spends the month of June. Personal letters and calls lead to more business from old sources.

12. "We only secure a part of the profit with the set sale. During the summer we push tube replacements, repairs, accessories."

13. An eastern hardware dealer offers a \$5 bill for prospect-names, if, of course, the sale is made. Receivers purchased must be over \$50. Offer good until October.

14. "Closings increased," writes a constant reader, "when we adopted the rule: *No daylight demonstrations*. We now spend the daylight hours, June to September, in 'build-up' work. Make the demonstrations in the cool of the evening, when reception's better."



15. Many people still think there's nothing good on the air during the summer months. Radio men can profit by calling attention to the fine programs about to be offered. Use these advertisements as an opening to get in touch with this type of prospect.

Service Sales Ideas

Here's what dealer service departments and the independents do to increase their repair volume

PUBLICITY PLUS

Cleveland members of the IRSM went to the radio editor of the *Cleveland Press*, offered to answer questions submitted to his column concerning radio technicalities without charge. The editor, whose column was immeasurably strengthened by this free offer to subscribers, printed the following announcement:

"With the help of the Cleveland chapter of the Institute of Radio Service Men, we will attempt to answer questions you may have regarding your radio set and its reception. The local chapter is composed of 100 servicemen in all sections of the city. The group is competent, both from a technical and practical standpoint. It is in a position to offer unprejudiced answers to your questions. In cases where your questions reveal technical faults in your set necessitating professional service they will recommend a competent serviceman in your neighborhood. Questions and answers will be run here weekly. The first batch will appear this Friday."

Good publicity? And how!

SALES-SERVICEMAN

A complete record of all radio repairs is kept by the Griffin Electric Co., Santa Fe, New Mexico. Whenever repairs are found to be running exceptionally high, *the cost per month is figured out and the customer is shown where he could save money with new equipment.*

The radio repair department was installed three years ago, with the idea of developing extra sales. To that end a repairman, who was also a good salesman, was sought and eventually found. Since that time radio sales have increased 25 per cent.

In some cases a repair call will yield an immediate sale. But more often it is a case of follow-up contact. On returning from every call, the service man fills out a permanent record giving the following information: make and model of set, general condition of set and cabinet, repairs done and whether the customer seems interested in a new radio.

The TRUTH about RADIO SERVICE

A Statement by

STAR RADIO CO.

No one EVER gets "Something for Nothing"...The odds are all against you!

We COULD offer you FREE RADIO SERVICE... But you know and we know that it would cost us money... Money which we inevitably would have to get from our customers in one way or another.

We MIGHT collect our expenses by overcharging you for work actually done or by selling you unnecessary parts... Opportunities for such methods are inexhaustible.

We prefer to lay our cards on the table.

Our average expense involved in sending an employe to examine a radio set is \$1.00. We therefore charge our patrons that amount... We are thus in a position to honestly diagnose the trouble without obligation to the set-owner and without NECESSITY of FINDING some difficulty which will require an expensive repair job or new parts.

Many difficulties may be adjusted during such an inspection and in that case are included with the Star Radio Service charge of \$1.00... When extensive work or replacements are necessary we deduct the service charge from the bill because it may then be included in the normal overhead cost of doing business.

Another circumstance warranting the Star Radio Company's service charge is the professional character of its employes... You would not expect a surgeon to give an unbiased diagnosis of an illness if you required him to depend upon an operation for his remuneration, neither can you command competent radio technicians under similar circumstances... Our employes are experts with the knowledge and skill of long experience.

The Star Radio Company is firmly convinced of the maxim "Honesty is the Best Policy" because our outstanding success has been built upon this foundation. We believe that the general public will appreciate our reasons for maintaining a "service charge" for radio trouble calls... In all sincerity, we would have to sacrifice our ideals of fair dealing by making excess profits on actual work or parts sales if we should offer "FREE SERVICE."

STAR RADIO CO.

GOLDEN RULE

There's a trend toward "truth in advertising." Gimbel Brothers, in New York, has found it profitable to describe merchandise with sometimes painful accuracy and now the Star Radio Company of Washington, D.C. reports results.

The reprinted advertisement from the "Washington Herald" tells the whole story and it certainly reads well to us. Stanley Glaser of Star passes it along as a suggestion to other service shops. With a little "hand-tailoring" it will pull for others

Where a prospect is "hot" the date for follow-up is indicated and the card placed in a special date file. Other prospects who are judged "good bets" are followed up about every 30 days.

"We consider every repair customer a future prospect," says manager Eugene Griffin. "Even if a machine is only six months old, it will be replaced some day and if we keep in touch with the owner we will have an excellent chance of getting that sale. We probably make sales immediately on about 10 per cent of our service calls. The whole thing depends on getting a repair man who can sell."

RAU'S RULES

Henry Rau, dealer, 110 Monticello Ave., Jersey City, N. J., has adopted the following rules, attributes service profits to them:

"1. Get an hourly labor charge sufficient to take care of wages, overhead and net profit. Inadequate fees run many service departments into the ground. We charge \$2 per hour for labor and add actual parts cost.

"2. Service on a time and materials basis if possible. Most customers will agree to this method when it is explained that because it is difficult to determine the exact state of a receiver before it is opened up flat rates must necessarily be made high for protection.

"3. Repair everything wrong with a radio before de-

FREE! FREE! FREE!
DON'T BE FOOLED BY SO-CALLED FREE RADIO SERVICE CALLS!

Advertising Free Service Calls misleads you by making you think you receive something for nothing whereas the truth is you eventually pay for that call in added labor charge or increased cost of parts. It violates the radio fair practice code.

We, the undersigned service men of Santa Monica and Ocean Park, charge only \$1.00 for a radio service call... then we tell you something that will lead to repair your radio... and charge you for tubes and parts at lowest price, and labor at a minimum cost. You save money in the long run.

For consultations repair work call one of the undersigned responsible radio dealers and service men. They call, service and repair all makes of radios.

<p>Adams and Sons 1401 Fourth St., Santa Monica Phone 2132</p> <p>Bay Music Company 1441 Fourth St., Santa Monica Phone 2021</p> <p>K. E. Eagle 1200 Montana Ave., Santa Monica Phone 2041</p> <p>Halfway Music Company 418 Broadway, Santa Monica Phone 1913</p> <p>Leon Johnson 1242 Fourth St., Santa Monica Phone 1928</p>	<p>Manning's Radio and Electric Service 12 W. and W. B. BARNES 1100 Santa Monica Blvd., Santa Monica Phone 2040</p> <p>Ocean Park Radio Service C. WILKINSON 111 First Ave., Ocean Park Phone 4511</p> <p>Sam Caruthers Radio Sales and Service 1125 CARUTHERS 124 First Ave., Santa Monica Phone 2028</p> <p>Radio Bargain House J. S. LEBLANC 110 and Broadway Santa Monica Phone 1917</p> <p>Radio Sales and Service Company 794-1011 Broadway 112 Santa Monica Blvd., Santa Monica Phone 2124</p> <p>Radio Service A. J. GREGG 118 Santa Monica Blvd., Santa Monica Phone 2027</p>
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KEEP THIS AD!
 Hand this ad for reference when buying new or used radios or when in need of repairs, repairs or parts

THE RADIO HOSPITAL
 7830 FORTIETH AVENUE KENOSHA, WISCONSIN

Attached with the enclosed Amplifier Service

Radio Service for up to 1000 sets of Radio

Amplifier Service—Rebuild Repairs and Permanent Installation

Short Wave Equipment

Automatic Tuning—Graph Service

Member of the National Association of Radio Service Men

A. R. R. L.

Dear Friend,

We are sure that when you have trouble with your radio you are going to call a radio service man who is qualified to offer expert service at a reasonable cost, therefore we would like to have you remember the following facts when you experience trouble with your radio:

We have been in the radio service business over nine years.

We do radio service work exclusively.

We use only the best material in our work.

We have a complete library of radio circuits and data on every known make of radio.

We have the most completely equipped radio laboratory in Kenosha using all modern equipment.

We are in a position to offer you the lowest prices on radio repairing.

Hoping we may have the pleasure of serving you in the near future we remain,

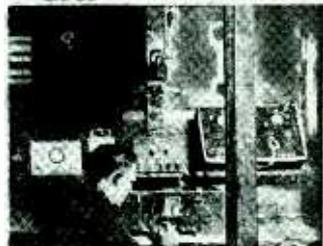
Yours very sincerely,
 The Radio Hospital

Edward G. Kertz
 Service Engineer

Presentation of this letter entitles you to a complete inspection of your radio set FREE.

DEPENDABLE · EFFICIENT · SATISFACTORY SERVICE
DIAL 4445

The ULTIMATE in Radio Service



In accordance with our policy of trying to give our customers the best, we have installed a complete shielded balancing laboratory and equipped it with the latest and most modern equipment obtainable. With this addition to our service department we are able to give complete factory service on any home or auto radio. We believe we have the most modern and best equipped service department available to the general public in the southwest.

Wholesale service for all Oklahoma on Zenith Radios for the Peaslee Gauthier Corp. Wholesale installation and service on auto radios for some of the city's leading radio and automobile dealers.

H. E. MUSSON & CO.
 704 N. Broadway Store Hours 8 A. M. to 7 P. M. 2-4246

CO-OP FIGHTS GYP

Dealers and independents of Santa Monica and Ocean Park, California, have joined advertising forces to combat what they consider to be destructive service solicitation.

Eleven ran ads in the local newspaper, copy running along the lines of the sample. Their names, telephone numbers and addresses are carried in each item, each one contributing to the cost

DIRECT-MAIL

Edward G. Kertz of Kenosha, Wisconsin, writes: "We sent a copy of the letter inclosed to every telephone user in this city. We received an average of one repair job out of every ten letters sent"

Note that Mr. Kertz's letter is printed, not mimeographed. The type is large and easy to read. The use of short paragraphs is admirable. Note also the other permanent sales features of this letterhead. Looks like mighty effective advertising to us. Worth a try in other cities

SAYS IT WITH PICTURES

The H. E. Musson Company, of Oklahoma City, prints a picture of its well-equipped service department in every newspaper ad. Here is a typical one, in which a new completely shielded alignment room is played up

There is nothing which inspires confidence in the store's service quite so well as this method, according to the manager

livering it unless the customer demands specific repairs. Tell each customer before removing the set from the home that the set will be entirely reconditioned. If he insists on a specific repair we are thus protected against failure of other parts. This eliminates unfair complaints. At least 40 per cent of the old radios encountered have more than one thing wrong with them.

"4. Itemize all service bills. This builds consumer confidence. We split parts and labor, listing each separately.

"5. Get list price for tubes. We sell 3 dozen daily and although other operators undoubtedly get a greater volume it is our opinion that we make more net profit.

"6. Talk 'reconditioning' service, never 'repairs.' Our bills are headed in this manner and a sign over our service shop reads 'Reconditioning Department.' This is psychologically better and results in fewer arguments about bills."

NEW USE FOR MANUALS

The Radio Electric Service Company of Allentown, Pa., has hit on what we believe to be a new and practical use for service manuals. They are used to help sell parts.

A complete set is placed in a filing case right near the store entrance, with a sign reading: "Circuits of all radio receivers and parts values shown here." A small desk and a chair is placed in front of the file.

When a customer comes to the store for the part he is

invited to check its proper value in the manual file before purchasing a replacement if he doubts the suitability of the part offered. The circuit service, available to all customers, is generally appreciated.

GUARANTEE, IN BLACK AND WHITE

Bill Toth, of Certified Radio and Electric, Cleveland, presents the following guarantee to every service customer, claims that it avoids trouble due to grief arriving elsewhere through no fault of his:

RADIO SERVICE GUARANTEE

For the sum of \$ 4.00 received for radio service work done on a Majestic 70 radio receiver, serial number A8659B for Mrs. W. C. Jones of 4612 Detroit the following work is guaranteed for a period of 90 days from May 3, date of delivery.

- One dial cable—guaranteed against slipping or breakage
- Speaker—guaranteed against rasping at moderate volume
- Neutralizing—guaranteed against squeals

This guarantee covers only the above 3 repairs. It does not include parts or tubes other than those specifically included or troubles which have no connection with the above.

(Signed) **WILLIAM TOTH,**
Certified Radio & Electric Co.

Cost Accounting *for* **D**Dealer *and* **S**erviceman

By Russell B. Rich

IN his discussions in *Radio Retailing* of servicing costs, John Rider strikes squarely at a major weakness. But the servicer is not alone in his shortage of financial knowledge. This article continues the good work by outlining the principles of costing applied to a joint merchandising and servicing operation. The following is a suggested treatment for the average dealer. The value of retail costing depends upon the proper application of the principles to a specific condition—without turning the store into an accounting laboratory.

Continue to follow the conventional arrangement of accounts in the general ledger but, for the purpose of finding out which department is making or losing money, regroup expenses and income according to the following suggestions:

The proper distribution of set sales and repair work is obvious. But there is bound to be confusion as to the status of tubes, parts and accessories. This merchandise, if used by the service department in repairs is a service sale; if sold, however, over the counter or delivered to the home (not to be installed) is a merchandise sale.

Each service job should be recorded in a manner that will show: (a) description of the work, (b) the cost of labor, (c) the cost and billing price of each item of material and accessory used. Recapping this record for accounting purposes, the total service sales less (b) the labor costs of those sales, less (c) the cost of the merchandise should give the gross profit on the servicing operation.

By relieving the cost of total sales of the merchandise cost of service sales we arrive at the cost of pure merchandise sales. This is chargeable against corresponding income to arrive at the gross selling profit. Any loss on merchandise inventory due to price reductions, spoilage or other causes should be apportioned over the two functions in the ratio of merchandise sold.

Against the separate gross profits there are a number of direct expenses, other than direct labor, that are divisible into two groups and chargeable in totals:

GROUP A, DIRECT COSTS TO SALES:

- Salesmen's salaries and commissions
- Cash discounts on merchandise sales
- Trade-in allowances
- Insurance on merchandise
- Expenses of financing installment sales
- Reserve for free service calls

GROUP B, DIRECT COSTS TO SERVICE:

- Shop supplies
- Repairs to equipment
- Service data
- Insurance on equipment
- Compensation insurance
- Depreciation on tools
- Depreciation on testers and other equipment

With but two exceptions the above grouping is clear enough to need no explanation. Group A includes an item, "reserve for free service calls." The guaranty of free service on a set for a period subsequent to the sale is a sales inducement and the cost of fulfillment should be treated as a cost of selling that set. When free service is given in accordance with the sales policy, reserve account should be charged and service income credited with the total *cost* of the service—direct labor, materials and other costs.

In group B are three items related to equipment—repairs, insurance and depreciation. Very likely a portion of these three costs will be on the store's tube tester, a device used by both sales and service departments. If the dealer wants to go a step further in the direction of exactness a base can easily be found for removing the costs on this instrument from direct charges to service and distributing it over the two functions. The best allocation would be according to the number of tests made for each function which would require the keeping of a very simple statistical record right alongside the tester.

In the large establishment automobile expense may have to be handled two ways. If cars are maintained exclusively for salesmen, expenses of operation become direct costs to sales. They are as follows: garage rent, repairs, gas and oil, license fees, tires, insurance and depreciation.

In the case of cars used for the benefit of both functions an attempt must be made to distribute the above costs. The fairest method would be on the basis of the number of miles run for each unit which could be computed by the driver with no loss of time. Or the distribution can be according to the number of trips made for each.

Although the allocation of rent is arbitrary at best there are certain fundamentals to be followed. To arrive at a cost base consider the total floor space, in square feet, as divided into three sections, (1) Selling floor, window, merchandise storage space; (2) Repair section; (3) Office. Distribute

EVERY SALES-SERVICING RETAIL OPERATION should allocate expenses and income to the proper department. This article explains the theory underlying such charges.

HIGHLIGHT DEFINITIONS

Tubes, parts and accessories sold in the store direct to the consumer should be credited to the merchandise sales operation

Tubes, parts and accessories sold by the serviceman in connection with his work should be credited to the service department

An allowance, chargeable to the *sales department*, should be set aside to cover the initial costs of the free servicing of new set sales

Automobile operation is chargeable, pro rata, to both sales and service functions

This rule applies also to tube testers, telephone, rent, light, advertising, interest charges, management, etc.

Charge reconditioning of trade-ins to the merchandise department.

the total rent over these three divisions in as fair a ratio as possible, using the square feet of floor space as a guide but giving the most valuable space such as the selling floor a higher value per foot than the rear areas used for service and office. One way to go about this is to determine what your rent would be on the amount of space used for storage, service department and office if these functions were removed from the main street location. Deducting this from the total rent, the remainder is assumed as the cost of the sales floor.

The other factors of occupancy, heat, light and power should be distributed on the basis of floor space.

Relative to furniture and fixtures there are three items of expense—insurance, depreciation and maintenance. Under any conditions the general ledger account reflecting this asset should be supported by a detailed list of all articles, dates of acquisition and purchase price plus expense of delivery. For cost analyses this list should be divided into three sections: articles in use in (a) the sales section, (b) the service section, (c) the office. Once these records are set up revision becomes necessary only upon the purchase of new equipment or the disposal of old. With the separate totals available the insurance and depreciation factors can be charged off to a, b, and c in the same ratio.

At this point we have accumulated as office expense a portion of the rent, heat, light, power, an equitable amount of depreciation on furniture and fixtures and its share of maintenance on the latter. Now we add the total of office salaries, stationery, printing and postage (other than for advertising), dues, memberships and publications. Because no better way has been found to distribute the total of these expenses we are forced to employ the percentage of sales ratio.

Some advertising will be specifically directed to stimulate either merchandise sales or servicing, in which case it is chargeable to that function. Other ads, whether newspaper, direct mail, handbill, etc., will mention both merchandise and service. Here the cost should be absorbed in the ratio of space allotted.

Every unit phone should have a handy pad attached to its base for the purpose of recording toll calls, who made them and at what expense. By ruling the pad into columns, one for calls relating to service, one for all other, both incoming and outgoing, local and toll, a base is established for distributing the total telephone expense. Transportation paid on incoming merchandise is included as a cost of the goods.

Borrowed money finds its way very definitely into certain channels, the purchase of equipment, fixtures, merchandise, etc. Interest on it should be allocated in the same ratio as the other costs on the item it was used to purchase. If borrowed money goes into current operating expenses we are very likely beyond the point where costing will save us anyway.

In the regular course of business the service department is called upon to do work for the selling division. Two cases will serve to illustrate: The first is the installation of a set by the service man. Although this is connected with a merchandise sale there are service costs—labor, wear and tear, material used, etc. Delivery expense has already been charged to merchandise sales as stated above. But for all other costs the service section must charge the selling function, and this charge must not include any profit. The cost of labor and materials are known. Experience will suggest a formula for arriving at the amount of other costs to be charged to sales.

Much the same applies to the repair of trade-ins for resale. Ordinarily all trade-in transactions and their financial results should be taken up by the selling function. Therefore, all costs of repair and putting into shape for resale done by the service department are additional costs of trade-in transaction and are chargeable to selling.

Of course both of these types of work should be recorded in the same way and just as thoroughly as an outside job.

It is beyond the purpose of this discussion to argue for or against the advisability of charging proprietor's or partner's salaries to operations. If such is the practice, the allocation to sales and service should be as nearly as possible in tune with the facts. If an owner is primarily a service man and the most of his time is so taken up an arbitrary ratio may have to be established. Again the basis of the percentage of total sales may be satisfactory. Each case must be decided with full consideration for its own peculiarities.

The purpose of all this is to set up a very essential yardstick for determining price policies and to focus the attention of administration on weak spots that penalize other more successful efforts. Each unit of a business must be made to justify itself by covering all of its own costs. We cannot go on indefinitely writing service losses against sales income on some sort of a pet alibi and come out anywhere near the top.

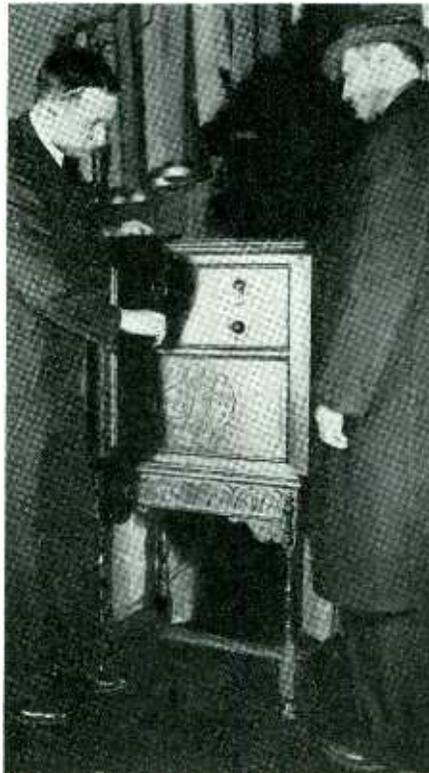
3 Step SELL UP

Ed and Morris Greenberg, Providence, R. I. dealers, solve triple problem of getting store traffic, liquidating investment in used sets and building console business by shrewd "horse-trading" salesmanship



1

Cheap midget windows attract more than 90 per cent of the store's customers



2

60 per cent of the bargain hunters are sold larger trade-ins instead of midgets

THE Greenberg Brothers (Adams Radio Company) are devotees of store selling. They close a few sales in the home, like anybody else, but prefer to peddle their papers on one of the main streets of Providence, Rhode Island.

The very nature of the business demands the advertising of cheap midgets as a come-on. Ed and Morris fine-comb the market each month for merchandise of this type, carrying an especially attractive list, or sufficiently novel in appearance to attract public attention. (An ultra-small "Pacific" midget brought to their attention by



3

And 45 per cent of the used set buyers eventually come back for new consoles

an ad in *Radio Retailing* last season panned out well.)

When console prospects are encountered in the downtown area they are usually shopping for a substantial allowance on their old set. So the number of trade-ins is necessarily high if the brothers are to get this business. Fifty-two per cent of new set sales involve trade-ins.

Pushing midgets and allowing up-to-the-hilt on stuff taken in trade squeezes profit down to a fine point. So selling up, moving new consoles having a decent margin, is an absolute necessity. The operation thus has three problems to solve:

1. Midgets must be used to attract store traffic. But obviously the business cannot survive on midget sales alone.

2. Trade-ins must be taken. But the operation can't take a licking on them.

3. Consoles must be sold to return a decent net. And yet customers must not be frightened away by high-pressure selling up tactics.

Straight "horse-trading" solves the triple problem.

Ninety per cent of all the people who come to Adams Radio are primarily interested in cheap midgets. Constant display of such merchandise

in the window is the chief attraction. The brothers show prospects the midgets they ask for. But they also simultaneously show them a used console. "The midget you are interested in is new and costs \$7.95. Here's a console with a real, full-sized chassis and speaker for only \$10. It's only a few years old and has been placed in perfect condition by our repair department. We sell it with a 90-day new set guarantee." This is the story. And 60 per cent of the would-be midget purchasers buy used consoles.

The average gross profit on a cheap midget is less than \$3, according to Ed. In the last 8 months the store has sold 154 used sets taken in trade—a \$2,605 investment—for \$3,899.

These sets cost an average of \$2 to put in condition. So the store grossed \$986. If midgets had been sold instead the gross would have been \$462!

Then there is a third step in the set up. The Greenbergs claim that 45 per cent of the used set buyers come back within one year for new consoles. They speed up this process by allowing exactly what the customer paid for the used job on such swaps.

Why do used console buyers come back for new consoles? The very fact that they bought a used console indicates that they would not be satisfied by a midget. They were really after a large receiver, but probably didn't have money enough at the time

to invest in a new one. When they get money the most natural thing in the world for them to do is to satisfy their original desire. And they have already, one might say, made the down-payment by buying the used job.

The Greenbergs claim their pushing of cheap midgets and used sets not only doesn't hurt new console business but positively aids it. They contend that they probably would never meet their customers in the first place if they featured expensive consoles from the very outset.

Well, one man's meat is another's poison. The system works out well for these Providence boys, at any rate.

Straight from the Shoulder

"Mississippi" Answers Mr. Cloyd

Editor, Radio Retailing:

In answer to the articles on page 28 of the April issue, I feel it now becomes my duty to say something. I had intended keeping quiet until I read the answer by Mr. Cloyd.

He thinks it is funny to compete with Sears, Roebuck and Montgomery Ward. Well, it may be funny to him but if he wants some real fun he should come to Mississippi and try it for a while. Or maybe Mr. Cloyd and I have different ideas about what is funny.

I will agree with him that National Carbon Co. has made it possible for us to sell batteries for replacement, but I will have to be cited to a standard radio that we can sell to the farmers at dollar to dollar competition with Sears and Ward. If the radio is bought from them the customer gets longer terms, a 12-month guarantee and a price about a third cheaper. Probably it is a cheaper radio but what does the farmer care about that. He wants price when he starts to buy a radio.

So Mr. Cloyd, suppose you cite us to a standard make radio that we can sell under the conditions prevailing. What can we give a 12-months' guarantee on, that won't take all our profit to keep putting tubes and parts in that will sell at the price necessary?

I live in a town of a little over 3,000 and with three dealers here sell about 10 per cent of the battery radios while Sears and Ward sell the other 90 per cent. What can we do to eliminate this is our question?

NRA doesn't seem to have done us any good. We thought there was going to be a code of fair competition which would keep the mail order houses who pay no taxes in our communities from cutting our throat.

And now on top of all this the tube companies are trying to put on a price war that will make it impractical for us to handle tubes. The expense of tube testers and other expenses incurred by testing tubes make it so that we can get no profit

on this article and if they go much lower we will lose money. I refuse to cut my list price on tubes another cent. Personally, I prefer to go broke not selling than by appearing to be doing a good business.

Also, the tube, radio and parts manufacturers should discontinue selling their products to radio catalog houses until they stop sending their catalogs to every Tom, Dick and Harry who ask for them. I am sure every dealer and serviceman will agree with me that there should be a law prohibiting this practice. What do you think about this, fellow dealers and servicemen?

W. E. King,
King's Radio Service, Louisville, Miss.

Tell Him, Somebody

Editor, Radio Retailing:

Can a manufacturers' representative, like ourself, continue to successfully merchandise sound equipment? We can form an opinion only by considering the local territory. In this entire section, which includes Minnesota, North and South Dakota and Wisconsin, there is only one jobber carrying a stock, and he is a parts house.

This jobber does not have trained men necessary to intelligently figure the equipment required for a sound installation. Nor does he have the equipment needed for a thorough demonstration, if desired. Nearly every company in the sound business has some type of representation but with the exception of the one operator mentioned they are all really retailers.

Last, but not least, the mail-order catalog houses have made it possible for nearly everybody to buy at 40 per cent discount.

We do not want to become price cutters, as we are very much opposed to these tactics, but something has to be done so that we can compete with mail-order houses in the sound field and still have something for ourselves and jobbers. We think that possibly a discount of 30-20-20 might be an easy way out. The 30 per cent could be used as a trade-in allowance, or to compete with mail-order houses.

Twenty per cent could be given dealer or jobber. And there would still be 20 left for our sales work, for which we would make all demonstrations, supervise installations and estimate.

R. R. BAUMAN
R. R. Bauman Company, St. Paul, Minn.

Dealer-Servicemen Groups Condemn Recent Tube Price Reductions

Gentlemen:

I have been instructed to inform all radio tube manufacturers that the Radio Dealers and Service Association Inc., of San Francisco, vigorously protests the recent reduction in the retail price of radio tubes and is strongly opposed to further cuts.

Our opposition to these reductions is based on the belief that this price cutting is merely a fight between two of our large manufacturers and the radio dealer, an innocent bystander, is the one getting hurt.

The contention that at reduced prices we will sell more tubes is erroneous as we cannot honestly recommend new tubes where none are needed, and as those of the industry closest to the consumer, we know that a set owner only buys tubes as needed and does not object to the price, provided it is not exorbitant. Also to recommend new tubes where none are needed would be a direct violation of our motto, which is "For the Betterment of the Ethics of the Radio Profession."

C. F. Porter, Sect.
Radio Dealers and Service Association, Inc.
of San Francisco, Calif.

Editor's Note: The above resolution is typical of others which have been received by "Radio Retailing" within the past three weeks from radio dealer and servicemen associations. The Electrical Appliance Dealers Association, of Brooklyn, N. Y., "views with dismay and alarm" these price reductions on tubes, condemning them on five specific counts.

In the Heart of "Competition Row"

This Store Sold
10,000 TUBES
at
Full List Price

By R. A. Picard

BEING both a native New Yorker and a radio fan, Cortlandt Street isn't new to me. I've browsed through its parts displays and I've admired testing equipment until my resistance finally broke down and I bought far beyond my means. I've discussed high fidelity and low impedance with the technicians until they must long since have wished that I would take my valuable patronage to someone who has more time to waste. Yet it was with skepticism that I accepted this assignment.

"A dealer who actually sells that quantity of well-known tubes at full list right in the very heart of Cortlandt Street, the greatest radio gyp market in the world! Don't be silly! Everyone who goes there is hunting bargains. I speak from experience," I said to myself.

But I was eager to get a look at this fellow. Was he a Houdini or did he offer a quart of Scotch with every set of tubes purchased? These were the thoughts which ran through my mind as I walked west on Cortlandt Street toward Washington.

The outward appearance of Trans Atlantic was little different from the other places of the better grade which are to be found in downtown New York. The goods displayed were the usual variety of the latest models, though I saw nothing but the best known and most widely advertised brands in evidence. There were descriptive signs labeling the merchandise, some even featuring prices—at full list. There were no placards of the circus type—"Final Close Out," "Prices Slashed" or other traps calculated to ensnare the innocent victims. But with these exceptions and a commendable showing of neatness, the establishment of Trans Atlantic Stores is much the same as that of any other first class radio establishment.

The interior of the store was merely an amplification of what the outside suggested. Shelves of tubes and small radio sets, floor displays of console models, all attractively carded with description and price. A bit of simple but effective decoration here and there. But there was something about this store which instinctively quelled any impulse to ask for a cut rate.

Directed to the office, I was greeted by one of the partners, Lewis Rose.

"YES," he replied to my first question, "we have been here eleven years. I say we, because some of our clerks have been with us just about that length of time. In fact our newest salesman came just five years ago.

"One thing which is often forgotten is that Cortlandt Street is more than just a market for gyp radios and parts. Cortlandt Street is an important thoroughfare for thousands of commuters to New Jersey. It is also a convenient shopping section for thousands of downtown workers. The greater percentage of these people are not hunting for bargains. They are intelligent enough to be suspicious of them. They come to Cortlandt Street

because here are to be found a larger assortment of radio products than are shown anywhere in the world.

"Many of our customers have been dealing with us upward of ten years. We have improved their radio enjoyment starting from the time when the old battery sets were the only type made and continuing to the present era of efficient, high-fidelity models. These regular customers never think of questioning our prices."

And here I found the first answer to the puzzle which had been so baffling to me. "What is your position in the tube market," I asked.

VERY much the same as on sets," he replied. "We handle four brands. Two of them are makes which we never sell at less than full list prices. One is our leader. We have been handling it for four years and each year's sales have shown a marked increase.

"In most cases it is sold purely on our recommendation, although we have many calls for it by name as well," he answered when I inquired how he did it. "The tube is guaranteed for six months, but it is not necessary for us to avail ourselves of this guarantee. Between this and our other list price brand we sell about 10,000 tubes a year."

"And what about the other makes?"

"There are two of them. One is an advertised name which is sold all over at less than list prices. The other is a less known make which can be sold at prices competitive to most any of the gyps. We don't like handling these and we tried doing without them, but it seemed best to have them. Occasionally folks ask about these prices which they see displayed elsewhere and we find it easier to sell them a standard tube if we can show them both. They seem

(Please turn to page 44)



Section of the imposing spread of Trans Atlantic's show windows facing Cortlandt and Washington Streets

NEWS OF THE MONTH

TUBE COMPANIES PREPARE TO MAKE METAL SHELLLED PRODUCT

Early Availability Date Not Likely Due to Anticipated Production Problems In This "New Art"

The new metal shelled tubes announced last month by RCA and GE have captured the serious consideration of the tube and set industries. Out of a series of hurry-call meetings of both set and tube executives have come the more or less involuntary decisions to explore at once the feasibility of making these tubes and of incorporating them in some of next year's models.

"The retail trade should be advised, however," according to one prominent tube executive, "that it will unquestionably be a matter of a number of months before these tubes will be available and then only in limited quantities."

The problems involved are many. For example, expensive electric welding machinery of a type not heretofore on the market must first be obtained—for the present from one supplier only. Whereas in the glass tube the sealing processes involved less than an inch of surface and have been in common use for at least twenty years, the new technique of electrically welding almost five inches of metal to metal or metal to glass, under tremendous amperages and exact timing control, and of securing a high vacuum which will "hold," must first be mastered.

The general feeling seems to be that the metal tube will be so popularized as to create a public demand which cannot be ignored. Hence the decision of a number of the tube makers, involving not less than \$100,000 per concern in new machinery, to experiment with this tube.

September Release Probable

The trade hopes that the transition from glass to metal, if demand makes this necessary as now anticipated, will be a gradual and orderly one. The suddenness with which this development broke upon the radio industry found most of the set makers with their fall line already pretty well past the laboratory stage and many of them in actual production. Revised plans now call for the introduction, in September, of a few sets incorporating the metal tube—if they can be obtained and if they are found to measure up to the claims made for them.

The following is a partial list of tube makers who are negotiating for the purchase of the special machinery required to produce these new tubes: Arcturus Radio Tube Co.; the Raytheon Products Co.; the Ken-Rad Corporation; National Union Radio Corp. and Tung-Sol Radio Tubes.

As of May 1, Hygrade-Sylvania was not prepared to announce any policy with respect to the metal tube. This company is, however, considering all the many pros and cons of this proposition most thoroughly.

Radio Retailing, May, 1935



Biehl's "Talking Kelvinator"

One of the promotion stunts being staged throughout the Anthracite territory by Biehl's Auto Parts, is the "Talking Kelvinator," which acts as its own salesman. When one goes within a few feet of the door, it opens automatically and introduces itself and by a mechanical phonograph arrangement working on the principle of the photocell, it goes into action and gives a sales talk about the features.

Corwin A. M. Manager for Raytheon

C. I. Corwin was appointed advertising manager of the Raytheon Production Corp., on May 1. Mr. Corwin comes to Raytheon with a successful background of advertising, merchandising and radio editorial work including an eleven year record with the National Carbon Co.

RMA TO DISCUSS NEW PRODUCTS, TRADE PROMOTION, REORGANIZATION

**Manufacturers Convene In Chicago June 11-12—
No Exhibits This Year—Jobbers Will Not Participate**

The Radio Manufacturers Association convenes as usual at the Stevens Hotel, Chicago, June 11 and 12. There will be no exhibits of any description this year. Nor will jobbers participate.

Paul Klugh is Committee Chairman and advises that the program will be given over largely to discussion of possible new products with which to pep up fall business and the formation of promotion and reorganization plans for the industry calculated to put such new products over.

On Thursday, June 13, a "Radio Industry Golf Tournament" will be held at the Calumet Country Club for RMA men who can remain after the Convention closes.

The program, still tentative, is as follows:

Tuesday, June 11

10:00 a.m. RMA Directors meeting
12:30 Luncheon
2:00 p.m. Set Division, Arthur T. Murray, Chairman
2:30 Tube Division, S. W. Muldowney
3:00 Parts, Cabinet and Accessory Division, Arthur Moss
3:30 Amplifier and Sound Equipment Division, R. A. O'Conner
7:00 Membership Dinner

Wednesday, June 12

10:00 a.m. Annual Meeting, President Leslie F. Muter presiding
Roll Call by Bond Geddes
Address and Annual Report, Leslie Muter
Other addresses
Annual reports by the treasurer and chairmen of the following committees: Sets, Tubes, Parts, Amplifiers, Special Code, Credit, Engineering, Legislative and Traffic
2:00 p.m. Meeting of new Board of Directors and election of officers

Case Electric to Make Sets

Arthur A. Case, formerly of the United States Radio & Television Corporation, has purchased the plant of the Bedell Manufacturing Company, located in Marion, Ind. Reorganized, as the Case Electric Corporation, with offices at 714 West Monroe Street, Chicago, this concern will engage in the manufacture and sale of a new line of radio receivers. Mr. Roberts will be sales manager.

MORE FACTS ABOUT THE NEW GE-RCA METAL-SHELLED TUBES

Since photographs and descriptions of the new GE-designed metal-shelled tubes appeared in the April issue of *Radio Retailing* we have been besieged with requests for more specific information. It seems that this was an announcement of vital interest to the radio trade.

Here are the answers to the questions most frequently asked:

1. The American-designed tubes bear little physical or electrical resemblance to the "Catkin" valves produced last year in England. The British product was quite as large as existing glass-inclosed types, used the outer shell as the anode, required external shielding, employed a large-area "feather-edge" seal between glass stem and metal shell.

The American product is considerably smaller than existing glass types, has an internal plate and uses the metal shell as a shield only, requiring no external "can," brings leads through individual and extremely small glass beads fused to metal eyelets having the same approximate coefficient of expansion.

The Catkin was not a new tube but merely an adaptation for receiving tubes from transmitter tube technique. The American all-metal tube represents new processes, such as Thyatron tube welding; a new alloy, developed for this job.

2. While the new type American metal-shelled tubes will undoubtedly be improved, as have been all other types following their introduction, they now have been developed far beyond the experimental stage. Designed by General Electric engineers, they will definitely be used in Fall production receivers. At this writing it would appear that a number of set makers will incorporate them in one or more types of 1936 receivers if obtainable.

All RCA licensed tube makers will be permitted to tool up and make these tubes if they so desire and any licensed set manufacturer may likewise utilize them just as soon as production schedules make them available.

3. Metal-shelled tubes radiate approximately the same amount of heat as do glass-inclosed types of the same power rating. In other words, while there is more heat generated per square inch of tube envelope, the superior radiation characteristics of the iron casing dissipate this heat so rapidly that the tube operates at no higher temperatures than do the glass type.

4. There are already 10 tube types in the new metal-shelled line, including a Class B twin triode and a Pentagrid Converter—both multi-purpose types.

5. The tubes draw no more filament or plate current than comparable glass types. Here is the characteristic data on the metal 6A8 Pentagrid Converter and its transparent brother, the 6A7:

	6A8	6A7
Heater voltage	6.3	6.3
Heater current	0.3	0.3
Plate voltage	250	250
Screen voltage	100	100
Anode grid voltage	200	200
Control grid voltage	-3	-3
Total cathode current	14	14

6. Tubes fail through lack of emission, more than for any other reason. The presence, therefore, of a light is scarcely

an indication of tube worth, as the industry has preached for years.

7. Insulation between leads is still glass, hence quite as good as in existing types. And there is at least as much glass thickness between each lead and the metal "header" as between separate leads in a pressed glass stem. Furthermore, leads are not bunched together as in the "bottle neck" assembly method. The new "direct" method reduces capacity between leads because spacing between them is greater. Also, the leads are shorter. These factors make the tubes especially attractive for shortwave use, it is contended.

8. Metal base is electrically welded to metal shell under a current flow in excess of 50,000 amperes. Base and shell become, therefore, an integral unit, casing cannot be twisted from its base.

9. All tests to date indicate that one of the outstanding advantages of the metal-shelled product is its "gas clean up" feature—the iron casing possessing the property of absorbing residual gasses thereby improving the operating characteristics of the "metal" tube.

Southern Servicemen To Meet In Montgomery

The Second Annual Convention of the Alabama and Southern District Servicemen's Associations is to be held in Montgomery, Alabama, at the Hotel Whitley, June 17, 18, 19 and 20. Exhibits are included and it is expected that the affair will be the biggest ever held in the South by this branch of the industry.

There are to be technical and sales lectures on every important phase of the art, demonstrations, displays of sets and test equipment and parts. There will also be

RAY V. SUTLIFFE Appointed Editor of "Radio Retailing"

With this issue, Ray V. Sutcliffe becomes Editor of *Radio Retailing*. Mr. Sutcliffe joined the McGraw-Hill Publishing Company in 1924 as Western Editor of *Radio Retailing* and *Electrical Merchandising*. In November, 1929, he was called to New York to assume the duties of Managing Editor of *Radio Retailing*.

O. H. Caldwell, former Editor of this publication, has been appointed Consulting Editor and in this capacity his extensive radio experience and counsel will still be available to *Radio Retailing*.

Mr. Sutcliffe, in his ten years of association with the radio industry, has had unusual opportunities for intimate study of the many problems of the radio dealer, jobber and manufacturer.

entertainment and a banquet. The convention has the cooperation of the Chamber of Commerce, the Hotel Men's Association, jobbers, dealers and servicemen.

We'll Be There!

To the many readers of *Radio Retailing* in the South: W. W. "Bill" MacDonald, technical and service editor for RR, will preside at our booth during Southern District Radio Convention, Whitley Hotel, Montgomery, Ala., June 17-20.

P. A. Sales Growing

Applications for the use of p.a. equipment are rapidly growing, reports J. M. Kuhlik, sales manager of the Miles Reproducer Co., New York. In the last 60 days his company has built systems to cover varied new applications such as in jails, department stores, restaurants and soda fountains. Also auto sound systems for advertising and window demonstration purposes as well as an inter-office system for a lawyer.

The value of p.a. equipment is proven by the fact that when a tube or battery goes dead the owner keeps after the installation man and begs for immediate service at any cost stating he is losing money while the system is inoperative.

Ever See This Service Man in Chicago



When Homer O. McGuffey goes out on a radio service call for the Commonwealth Edison Company in Chicago, he frequently notices that the customer is cocking an eye at him rather appraisingly. She's trying to remember where she saw him before.

The answer is easy. For a number of years he posed for advertising photographs. His face has looked out upon millions from the *Saturday Evening Post*.

Radio Is First Choice

If Chicagoans obtain their wishes, the first things they will buy are radios, automobiles, rugs, and fur coats—at least those four items were the first choice of most persons interviewed in a survey of "what families want to buy next," conducted by the marketing department of the college of commerce of De Paul university.

Triumph Supplies Free Adapter for Metal Tubes

The introduction of metal tubes using radically different bases has conjured up visions of tube tester obsolescence in the field. The Triumph Manufacturing Company of 4017 West Lake St., Chicago, in a release received just in time to make our "deadline," announces that a free 8-prong adapter and test chart may be secured by model 400 owners by simply writing the factory. No circuit changes are required.

Arcturus Tube Prices in Line with other Manufacturers

The Arcturus Radio Tube Company, Newark, N. J., in keeping with the practices of the majority of other tube makers, April 1, added 11 cents to the "odd cents" group and priced its other tube types on an average of 10 cents over the RCA new list prices. Its lists are NOT "above the others," as stated last month in this magazine.

Four Philco Tubes Lower Than RCA

According to the latest price list issued by the Philco Radio & Television Corp., but four tubes are lower in price than those listed on the new RCA schedule. These are Nos. 10, 50, 48 and 81. All other types are identical in price.

"Five & Dime" Uses P. A.

W. T. Grant & Company's newest and largest store, located in Chicago, has just been public-address equipped by the Miles Reproducer Company. Seven microphones, located on two floors, at the soda fountain and in the luncheonette operate two speakers in the kitchen. Each mike is equipped with a switch and pilot light.

National Union Moves

New York City headquarters of the National Union Radio Corporation have been moved from the offices they have occupied since 1929 at 400 Madison Avenue to larger space at 570 Lexington Avenue, New York City.

At the new location, National Union has in addition to more floor space, quarters which are air-conditioned and scientifically lighted.

Pa., Del. and Md. Service Associations Federate

Six radio servicemen's associations operating in Pennsylvania, Delaware and Maryland have united to form a parent organization tentatively called the Affiliated Radio Servicemen's Associations.

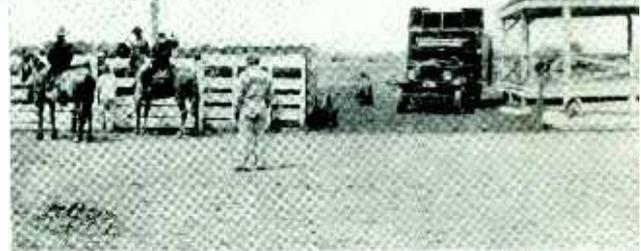
The determination to band together for the purpose of mutual aid, without influencing the politics of member groups, was carried to fruition at a meeting held on April 13 at the Penn-Harris, Harrisburg, Pa., under the chairmanship of Paul Ziesmer of Philadelphia. Associations grouped are the Anthracite Radio Servicemen's Association of Nanticoke, Pa., Associated Radio Servicemen of Williamsport, Pa., Philadelphia

Sound Truck Serves Double Purpose



Riga-Gravlin of Springfield, Massachusetts, uses its sound truck to advertise other merchandise. Here it is plugging the concern's voice-recording service and hearing aids.

And here it is again, rented for use at the Northampton Rodeo. Both applications return a profit to the company, one in publicity and the other in cash.



Radio Servicemen's Association, Pittsburgh Radio Servicemen's Association, Radio Servicemen's Association of Wilmington, Del., and the Radio Servicemen's Association of Maryland, Inc.

Frank J. Weipert of 408 Calvin Ave., Baltimore, was named permanent secretary and Leonard Jezorek of Nanticoke permanent treasurer.

Triad's New Policy Based on "Fair Profit to the Trade"

Proceeding on the assumption that the annual average cost of conducting a radio service business in a town of 5,000 population, including wages of \$30 per week, is not less than \$2,712, the Triad Manufacturing Company announces a tube policy "retaining list prices that will allow the serviceman a fair margin of profit." Other considerations behind this declaration for higher lists, are the assumptions that the serviceman sells at least 40 per cent of all replacement tubes, that these sales are limited to normal "wear out" demand and that much of the gross operating profit must come from the sale of tubes involved in a repair job.

Rosen to Distribute PA Products

Raymond Rosen and Company, prominent Philadelphia radio and refrigeration wholesale organization, will distribute RCA Victor centralized radio, public address, sound reinforcement and other commercial sound systems in the eastern Pennsylvania and southern New Jersey territory.

As a step in developing the potentialities of the rapidly growing commercial sound applications field, Rosen has taken over the business of the L. P. Clark Company which has for many years specialized in this work. Paul Ziesmer has been placed at the head of this newly created Special Products Division. L. P. Clark will work with him as sales engineer.

DEALER HELPS

For any or all of the dealer helps listed below, write to "Radio Retailing."

"Tests—Thousands of Them" is a remarkably complete compilation of technical data prepared by Supreme Instruments Corporation.

A new folder, "Facts You Should Know About Condensers," has just been issued by Sprague Products Company. Should prove helpful to every serviceman. States the honest facts about condensers and condenser claims.

Various methods of increasing signal strength pick-up on broadcast and short-wave bands alike and reducing background noises are dealt with in the new 1935 catalogue just issued by Technical Appliance Corporation.

In order to facilitate the work of the repair department in analyzing and repairing automobile radios, the Pioneer Gen-E-Motor Corporation has prepared an instructive booklet showing complete circuit diagrams and parts lists of the thirty most popular automobile radios.

This booklet indicates how replacement of power units can be profitably done by the same repair man.

Paul Pfohl Promoted

C. R. King, sales manager for RCA radio tubes, announces the appointment of Paul J. Pfohl, as sales manager of the Chicago district, including Illinois, Wisconsin, Indiana and Kentucky. Mr. Pfohl will headquarter at the RCA sales offices, 520 N. Michigan Avenue, Chicago.

Richard A. Graver, formerly Chicago District sales manager for RCA tubes, has been appointed sales manager of the Chicago Talking Machine Company, RCA-Victor and Radiotron wholesale house.

Heinzman Celebrates 11th Anniversary in New Home

The Heinzman Electric Company, East Akron, Ohio, announced last month, in full-page newspaper ads, the dual events of its Eleventh Anniversary marked by moving to new and ideal quarters at 1370 East Market Street. To Leonard Heinzman, president of this concern, goes much of the credit for the rapid and substantial growth of this live-wire outfit.

The new store is attractively decorated with cream-finished walls, beautiful hardwood floors, and Celotex ceiling, designed to absorb sound and make the rooms especially suitable for radio tones.

The new Heinzman store will carry such representative lines as Atwater Kent, Philco, Zenith and Sparton radios; Leonard and Sparton electric refrigerators; also Motorola auto radios.

John Casagrande Represents Zenith Radio in Midwest

John G. Casagrande has been made special representative for Zenith Radio Corporation for the territory comprising the entire Midwest.

Mr. Casagrande has a wide and varied experience in the radio industry and his many acquaintances among radio distributors and dealers will recall his association with Grigsby-Grunow as well as an association dating back fifteen years in the phonograph industry.

Lee Robinson Represents Stancor in N.Y. Area

Lee Robinson has been appointed New York district manager for the Standard Transformer Corp. of Chicago. This concern manufactures receiving set transformers and electric fans. Lee, as he is always called by his many friends throughout the radio industry, has established headquarters at 11 E. 44th Street. For many years he was editor of *Talking Machine World* later known as the *Radio Merchant*.

Fada Jobber Appointments

Fada Radio and Electric Co., Long Island City, N. Y., has signed with the E & L Battery and Ignition Co., whereby the latter will function as exclusive distributor in the Newark, N. J., trading area.

At the same time announcement is made of the appointment of the Wyeth Hardware & Mfg. Co. of St. Joseph, Mo., as Fada distributor for western Missouri and Kansas. Wyeth has been in radio since 1920 and handled Fada sets from 1922 to 1925. This renewal of business relationship is regarded as a distinct compliment to the merit of the 1935 line.

Wholesale Opens New Branch

Wholesale Radio Service Co., Inc., well-known eastern mail order house, has opened a new branch store at 542 East Fordham Road, New York. Jack Strong is manager.

PHILCO IN LEGAL BOUT WITH RCA OVER BACK ROYALTIES ON SETS

Bill of Complaint By Philadelphia Storage Battery Co. Issued in Delaware Chancery Court

AS WE GO TO PRESS, MAY 8—On or before May 21, the Radio Corporation of America must appear before the Chancellor of the State of Delaware at Wilmington and enter its defense in answer to a Bill of Complaint issued in the Court of Chancery of the State of Delaware at the instigation of the Philadelphia Storage Battery Co.

In its complaint, dated May 1, the Philadelphia Storage Battery Co. (James M. Skinner, President) contends, in Item 35, the nubbin of this action, as follows:

"Under duress, and solely by reason of the threat of the exercise of the alleged right of forfeiture of the license agreement by the said notice of April 9, 1935, and especially by reason of the fact that the sending of the said notice by RCA precludes any possibility of Manufacturer obtaining a judicial construction of the terms of the license agreement prior to the expiration of the 30 days after receipt of said notice, Manufacturer has paid, under protest, to RCA, under date of April 30, 1935, the sum of \$111,561.31 which is a computation at the stipulated rate of royalty upon the selling price by Philco and its wholly owned

subsidiaries and Transitone of all articles purchased by said corporation from Manufacturer between July 30, 1934, and Dec. 31, 1934, less the amount of royalties previously paid by Manufacturer to RCA upon the sales of the said apparatus under the license agreement to Philco and to Transitone during the said period."

In the language of the layman, it would appear that the Philadelphia Storage Battery Co., claiming to be the manufacturer of Philco receivers, has sold these sets to a "customer," the Philco Radio and Television Corp., and states, under the terms of its licensing agreement with the Radio Corporation, that the 5 per cent patent royalties applies to the price that the latter (Philco) has been paying to the battery concern (stipulated as the "Manufacturer"). Furthermore, that these two companies are not jointly owned but are independent concerns, one being the manufacturer and the other the sales agent or customer.

On the other hand, RCA has contended that the "customer" is the jobber and that the Philco Radio and Television Corp. is the manufacturer. It will be seen that royalty payments would be considerably more on this basis.

Philadelphia Storage Battery Co. further claims that the Radio Corporation of America by reason of its threat to withdraw patent licensing privileges has made this action necessary in self defense.

RCA claims that the "Manufacturer" violated the terms of its licensing agreement by intent if not by actual performance.

RR NOMINATES for membership in its PRIME MOVERS CLUB



Tobe C. Deutschmann

—who, since 1926, has persistently agitated for the suppression of man-made interference at its source. He has sponsored noise surveys in innumerable cities and carried the radio industry's tale of woe to many makers of electrical appliances and to the lighting companies.

As altruistic as any businessman's efforts should be, Mr. Deutschmann's "one man" crusade, which has depleted rather than swelled his personal fortune, now flows as a national movement under the auspices of the Radio Manufacturers Association.

"Tobe" is president of the Tobe Deutschmann Corporation, Canton, Massachusetts.

Family-Minded Programs

Are the broadcasters going domestic? It would appear so from the popularity of "family" programs now on the air. The Goldbergs started the procession. One Man's Family, a Pacific Coast rendition, started in a quiet manner some 3 years ago, has grown steadily in fireside popularity and now is sponsored by Chase and Sanborn's Tea. It has been given one of the best spots on the NBC-WFAF nationwide hook-up, Wednesday, 8 p.m., EST. Ivory Soap, taking a cue from One Man's Family, went a step farther and is embellishing the plot and action of the "Gibson Family" with original songs and musical scores.

Now comes the "Kilmer Family" which is being offered to sponsors by NBC and which will be "the story of a family whose future offers a true-to-life picture of a typical group temporarily impoverished." In a dozen other programs the action centers around the home circle.

NEW PUBLIC ADDRESS MERCHANDISE



Remler Portable P.A. System

The new 59 a.c. microphone introduced by Remler Co. Ltd., 2101 Bryant St., San Francisco, Calif., uses a single type 77 tube, triode connected as a pre-amplifier.

Designed for use with this new microphone is the Model AP-41 amplifier, an all a.c. operated unit which supplies filament and plate voltages for the microphone. It has a 4-stage, resistance coupled push-pull circuit, using three 6A6 dual triode tubes, two 2A3's and an 82. The use of balanced push-pull in all stages and resistance coupling throughout greatly reduces hum pickup and harmonic distortion, the announcement reads. Response including output transformer is within plus or minus 3 DB over the audio frequency range from 30 to 12,000 c.p.s. Another feature is an adjustable high-pass filter which may be used to decrease low frequency response where room conditions are responsible for acoustic feedback. A new 12-in. high fidelity wide range speaker and acoustically correct baffle cabinet complete this new system.—*Radio Retailing*, May, 1935.



Miles Mobile System

The mobile system type A, made by the Miles Reproducer Co., Inc., 112 W. 14th St., New York City, consists of a Miles 6-volt power amplifier having a built-in, heavy-duty 300 volt 100 m.a. motor generator, as well as a built-in phono-mike mixer with provision for instantaneous change-over from mike to phono and visa versa. This amplifier has provision for from 1 to 5 super power Miles giant trumpet speakers or up to 8 dynamic cone speakers. The amplifier gets its power from the car battery. Drain, approximately 12 amps. The tubes used are 6A6, 76, 2A3, 2A3. The entire system is listed at \$167.50.

Miles also offers the illustrated battery P.A. and detectophone system weighing 9 lb. It operates on 110 volts, a.c. or d.c., 25 to 60 cycles, also on 220 volts as well as on batteries. It has a built-in dynamic speaker for PA work and attachment for earphones for detectophone purposes. Power output, 3 watts. \$46.—*Radio Retailing*, May, 1935.

Radio Retailing, May, 1935

Western Electric P.A. Equipment

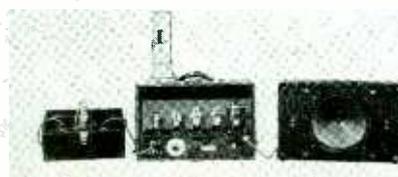
Complete facilities for the amplification and distribution of sound both in and out of doors are provided by the public address equipment manufactured by the Western Electric Co., 195 Broadway, New York City.

Designed by the Bell Telephone Laboratories and built on wide range sound principles like Western Electric sound picture and radio broadcasting systems, this equipment assures clear, rich reproduction of speech and music.

Equipment also is available which makes it possible to operate 3,000 or more radio receivers from a single antenna.—*Radio Retailing*, May, 1935.

Gates P.A. Equipment

The illustrated portable P.A. system of the Gates Radio & Supply Co., Quincy, Ill., is of unit design, i.e., it may be used with carbon, condenser, crystal or velocity microphones by slight changes. The photo shows two stage pre-amplifier for velocity and cell type crystal microphones. When used with a diaphragm type crystal microphone, carbon



and condenser microphones the pre-amplifier is not needed. It comes complete in leatherette covered case with dynamic speaker and tubes, and is listed at \$225 with the pre-amplifier and \$160 less the pre-amplifier.

Gates also makes an "Announcograph" consisting of a diaphragm type crystal microphone, two stage pentode type amplifier and dynamic speaker. \$86.

A centralized sound system is also available listing at \$750 complete less microphones.

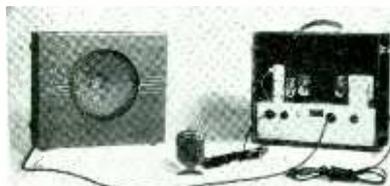
This company includes in its line about 20 different amplifiers as well.—*Radio Retailing*, May, 1935.

RCA Victor Portable P.A. System

A new portable public address and sound reinforcement system for moderate sized public places, compactly self-contained in a carrying case and weighing only 28½ lb. has been introduced by the RCA Mfg. Co., Camden, N. J.

This adaptable unit is particularly suited for such applications as window demonstrations, counter-to-kitchen call systems, and local fairs and carnivals. It is known as Model PG63-B and carries a list of \$79.50, complete.

The speaker which is embedded in the cover may be separated and suspended from a hook within a 25-ft. radius of the speaker cable. Provision is made for attaching portable phonograph turntables as auxiliary equipment where records may be required.—*Radio Retailing*, May, 1935.



Operadio Mobile P.A. System

The success of its Model 614 battery operated amplifier prompted the Operadio Mfg. Co., St. Charles, Ill., to develop Model 62 mobile public address system. All features embodied in the various component parts are the same as heretofore. Model 62 system is designed for service in cars and may be set on the floor or on the seat next to the driver-operator. A hinged false bottom which is adjustable to the pitch of the seat permits placing the unit on any seat and still maintain a level turntable. All controls are next to the driver and accessible for instant control. Overall gain is 75 db, power output 18 watts, power supply 6 volts, d.c.—*Radio Retailing*, May, 1935.



"Sound System" P.A. Equipment

Practically everything needed for the assembly of public address and sound systems may be obtained from Sound Systems, Inc., 1311 Terminal Tower, Cleveland, Ohio.

For example this company manufactures two complete lines of amplifiers, including pre-amplifiers, for crystal microphones, main amplifiers and output amplifiers. For use with these they make crystal microphones and all types of speakers including 3½, 4½ and 6 ft. trumpets and all types of permanent magnet dynamic and electro-dynamic cone speakers. They also manufacture complete sound systems for schools.

Among the portable P.A. systems offered is the PAC-3 a small system including a 3-watt amplifier and electro-dynamic speaker and crystal microphone, all mounted in one small light weight cabinet. The price, complete with tubes, \$87.50.

PAC-7 includes a 7-watt amplifier, two speakers and a crystal microphone. This type of equipment is used by the larger dance bands, theatres, etc.

PA-105 pre-amplifier is ideal for sound cell crystal mikes. It is provided with standard output impedances.—*Radio Retailing*, May, 1935.

Radolek Amplifiers

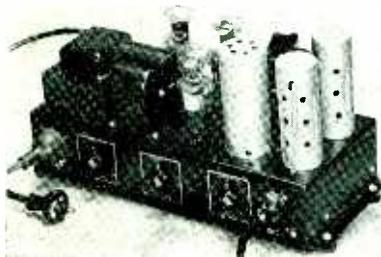
High gain and excellent fidelity are the features of the new line of medium sized P.A. amplifiers developed by the Radolek Co., 601 W. Randolph St., Chicago.

Illustrated is an 8 watt six tube affair with approximately 130 db. gain. It is intended for use with crystal microphones of both the cell and diaphragm types. Field current for one 1,000 ohm dynamic speaker is supplied. Connections are supplied for an additional speaker of the a.c. type with its own rectifier. \$60 with tubes.

The second of the new series is designed for use with a carbon mike. An overall gain of 65 db. is secured with a uniform frequency response from 50 to 8,000 cycles. A 5Z3 rectifier supplies the high voltage d.c. and provides field for one 2,500 and one 3,000 ohm speaker field. Ten watts is available for each speaker. \$27.50.

The third new amplifier is intended as a replacement for old type '50 amplifiers and where greater power is required than available from 8 watt outfits. The input employs a transformer for a standard 200 ohm per button, double button carbon microphone. Provision is made for a radio-phono input which can be mixed with or faded into the microphone signal. Field current for two 1,000 ohm speaker fields is provided in a bleeder circuit independent of the filter system. \$57.50.

Supplementing this equipment, Radolek has designed a single and dual channel pre-amplifier for use with crystal, ribbon or dynamic mikes. \$45.—*Radio Retailing*, May, 1935.



Wright-DeCoster Reproducers

Wright-DeCoster, Inc., St. Paul, Minn., is making a most complete line of reproducers and horns especially designed for P. A. work. There are models to fit practically every need from the less expensive to the most exacting installations.

For the average need there is Model 3500 utility combination reproducer and horn. Model 900 matching transformer is extremely adaptable as it will take care of from 1 to 6 speakers with any amplifier having an output of either 500, 1,500 or 4,000 ohms. Speakers with separate transformers can be furnished to match any impedance. \$35 without transformer; \$37.50 with small transformer on speaker; \$9 for the Model 900 multi-impedance matching transformer.

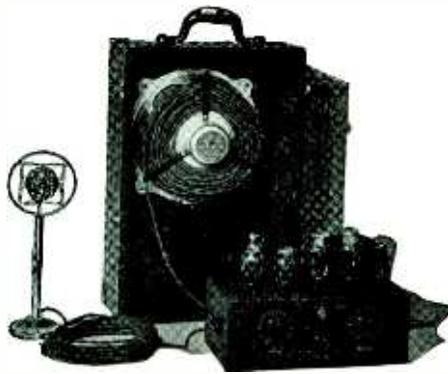
In addition, there are the Stadium Senior and Junior reproducers ranging in price from \$45 to \$58; Model 15000 horn designed to accommodate the Stadium Senior reproducer, \$150, with turntable stand, \$240. A Stadium portable combination is \$90. Model 1985 baffle measuring 4 ft. 2 in. square is \$19.85.—*Radio Retailing*, May, 1935.

"Pam" P.A. Systems

S. H. Couch Co., Inc., N. Quincy, Mass., who purchased the business of the Samson Electric Co., Canton, Mass., two years ago, and is now making the "Pam" P.A. equipment, offers a "midget" P.A. system consisting of a Pam 71 speaker amplifier, MK 71 microphone amplifier and a dynamic speaker compactly and permanently fitted into a small carrying case. Made for gatherings up to 500 persons. \$139.50.

The "Senior Pam-O-Phone" is a combination phonograph-microphone-amplifier unit with sufficient power to fill a large auditorium. Compactly installed in two carrying cases. Complete, \$449.50.

Couch also makes microphones, speakers and accessories for sound systems as well as centralized radio systems.—*Radio Retailing*, May, 1935.



Webster Portable P.A. System and Amplifiers

Model PA-17 of the Webster Co., 3825 W. Lake St., Chicago, Ill., consists of a three stage amplifier having 17 watts output class A, 12-in. dynamic speaker, No. 1201 double button carbon microphone mounted in a 12-in. desk stand with 25 ft. of cable and polarized plug assembled in a carrying case. A second speaker is available in a companion half case if desired. The price is \$112.50 with one speaker and \$155 with dual speakers.

Model DRS pre-amplifier is an a.c. operated, two stage amplifier designed to bring up the output of velocity ribbon, crystal, condenser and dynamic microphones to a level required for mixing circuits, etc. It develops 60 DB gain using two 6C6 tubes and an 84 rectifier. Output is 200 and 500 ohms. Input impedances are 50, 200 and 500,000 ohms and 2 megohms. \$68.50 without tubes.

Model A-30 amplifier is a 30 watt class A amplifier assembled in a well ventilated steel case. It supplies microphone current, has a dual input for microphone and phonograph or radio with "mixing" arrangement and includes microphone current meter. It has a gain of 84 DB; output impedances of 500, 18, 8 and 4 ohms, and inputs for 200 and 10,000 ohms. \$120 without tubes.—*Radio Retailing*, May, 1935.

Electrostatic Microphone

A radically improved type of microphone known as the American Electrostatic microphone is announced by the American Microphone Co., 1915 S. Western Ave., Los Angeles, Calif. This microphone has no inherent noise, immune to temperature changes and is unaffected by atmospheric moisture and barometric pressure changes, the announcement states. Has no cavity resonance and is free from structural resonance peaks. It is of high impedance and can be connected directly into the grid without a matching transformer. Another advantage is that it can be operated as much as 200 feet from an amplifier without the need of an intervening pre-amplifier. Available in two models listing at \$20 for the stand mounting type and \$25 as a hand microphone.—*Radio Retailing*, May, 1935.



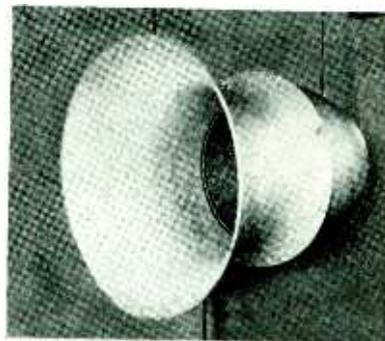
Concentric Cable Transmission Line

Two sizes of concentric cable transmission line are being manufactured by Doolittle & Falknor, Inc., 1306 W. 74th St., Chicago, Ill. Type C-1 is suitable for powers up to and including 1000 watts and Type C-2 is suitable for powers up to and including 50,000 watts. In small quantities, 50 cents per foot.—*Radio Retailing*, May, 1935.

Macy Directional Baffle

A new model all-metal aluminum baffle has just been released by the Macy Engineering Co., 1451 39th St., Brooklyn, N. Y. Its use permits a much more even sound distribution and reduces bothersome feedback difficulties. This baffle is weather-proof, light in weight and free from any metallic resonance conditions. It is demountable and is joined together with special wing nuts holding the felt insulated sections together. Mounting loops are supplied for use in hanging the baffle unit to bracket or ceiling support.

Model MB-10 is supplied for use with all models and sizes of speaker cones up to 12 in. overall size: bell 17 in., length 20 in. Macy also manufactures a complete line of reproducing equipment.—*Radio Retailing*, May, 1935.



Acratone Amplifiers

Designed for mounting under the dashboard of an auto or sound truck, the 15 watt mobile amplifier of Federated Purchaser, Inc., 23 Park Place, New York City, comes with remote steering column control. By means of a special switch, a feature of this amplifier, more than 50 percent of the usual battery drain is saved, Federated claims. Input impedances: 200 and 500 ohms. Output impedances: 2, 3, 4, 6, 7, 8, 10, 12, 13, 15 and 500 ohms. \$79, less tubes.

Model 198 high-fidelity amplifier has a frequency range of from 40-10,000 c.p.s. plus or minus 1 db., dynamic coupling, 11 choices of impedances. \$35.

The complete Acratone amplifier line ranges from a small 8 watt amplifier to a large 100 watt power stage. The 15 and 30 watt models are available with built-in, 2-position mixer and fader.—*Radio Retailing*, May, 1935.



Taco All-Wave Antenna Systems

Three new antenna systems have just been announced by the Technical Appliance Corp., 27-28 Jackson Ave., Long Island City, N. Y. The systems come in kit form, complete with all accessories, fully wired and soldered at the factory, ready to be strung up.

The V triple doublet (No. 70), the double doublet (No. 80) and the single doublet (No. 90) incorporate the latest developments in noise reduction through proper matching of antenna and set transformers, combined with a special twisted-pair transmission line. All set transformers are fully automatic.

The components of these kits used in connection with a multiple-position, double-throw switch are ideal for store demonstration.—*Radio Retailing*, May, 1935.



Stromberg-Carlson Model 82

A new all-wave set has just been announced by the Stromberg-Carlson Tel. Mfg. Co., Rochester, N. Y., to be known as Model 82. According to company engineers this receiver possesses greater selectivity and sensitivity and has better tone quality than any other S-C radio selling up to \$400. Model 82 is \$187.50 in the East, and \$195 in Texas and from the Rockies to the Coast.

Features include the Selectorlite dial, visual tuning meter, master oscillator tube, 15 watts Class A power, automatic antenna selection as well as twenty improvements in construction.

The cabinet is of the open face type and continues the rounded corner effect first introduced in Models 56 and 64, and which proved to be so popular.

This set covers every wave length continuously from 520 to 23,000 kc.—*Radio Retailing*, May, 1935.



Wolf Resonator

Illustrated is a rebuilt orthophonic radio and phonograph combination wherein the Wolf resonator principle is employed, as shown in the left side of the cabinet. In the right section an all-wave radio receiver has been connected up with phonograph attachment which is located in the upper section where the phonograph unit consists of an a.c.-d.c. phonograph motor unit having a variable speed of 33 $\frac{1}{3}$ and 78 r.p.m. There is a 10-in. Jensen cone unit in the upper left section of the cabinet which sends the sound down into the resonating tubes and the sound is reflected from the water surface directly under the resonators. The polished pewter lining has been built into this cabinet as a water container. The price of this type of installation is \$500.

Model R501 is a much larger resonator which comes in a solid form of cabinet and sells for \$400. The radio and phonograph combination is separate. Available from the Wolf Acoustical Laboratory, Inc., 48 W. 48th St., New York City.—*Radio Retailing*, May, 1935.

Lightning Calculators

By the proper setting of the dials and the indicator on the lightning calculators available from the Lightning Calculator Co., Bogota, N. J., it is possible to obtain direct reading answers to the various circuit problems for which they are designed.

Sample question: What frequency will a 100 mmf. condenser and coil tune to if a coil is 2 in. long, 1 in. diam. and wound with No. 30 wire?

There are four models—the radio calculator, the ohms law calculator, wire data calculator and the resonance calculator. \$1 each.—*Radio Retailing*, May, 1935.

Westinghouse Auto Radios

Under the trade names, "Drum-Major" and "Leader," Westinghouse Electric Supply Co., 150 Varick St., New York City, has brought out two motor car radios, listing at \$52.95 and \$44.95.

The Drum-Major is a round set with "zip" cover which makes tubes and parts easily accessible. The six tubes in this set are 2-77, 78, 75, 42 and 84.

The Leader is a single unit square set taking a 6A7, 2-78, 85, 41 and 84. The control heads on both models are attached for uniform mounting either on the steering column, ash receiver or dash mounting.—*Radio Retailing*, May, 1935.



Farm Radio Battery Charger

The long-felt need for means of overcoming the expense and inconvenience of taking farm radio batteries to town for recharging has led to the introduction of a new line of direct wind driven battery chargers developed by Wincharger Corp., 2702 Hawkeye Drive, Sioux City, Iowa, an outgrowth of the well-known Albers Propeller Company.

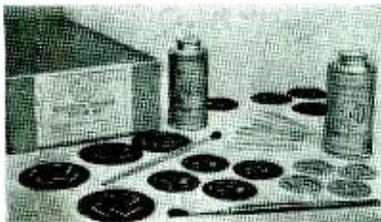
The "Wincharger" standard generator has an output of 6 volts and 16 amps. in a 20-mile wind. It starts charging in a 12-mile breeze and will charge two heavy duty radio or car batteries at one time. The important feature of the Wincharger is the fact that it will operate effectively in a very slow wind due to the high-speed direct drive propeller.

There is also a de luxe model having a maximum output of 6 volts and 22 amp. It starts charging in an 18-mile wind and has power sufficient to charge 3 to 5 6-volt heavy duty storage batteries simultaneously.—*Radio Retailing*, May, 1935.

Eagle Products

An improved radio ground clamp, Cat. No. 213, is now being made by the Eagle Electric Mfg. Co., Inc., 59 Hall St., Brooklyn, N. Y.

Eagle also has introduced a copper lead-in equipped with heavy coppered screw nut and bolt terminals.—*Radio Retailing*, May, 1935.

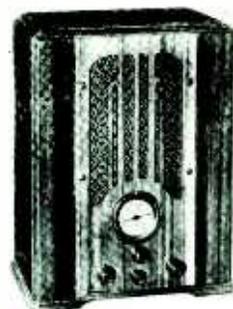


"Multiplex" Speaker Repair Kits

Several "first aid" kits for speaker repair work may be obtained from Multiplex Radio Service, Inc., 88 Fourth Avenue, Brooklyn, N. Y.

They range in price from 59 cents to \$5.39 depending on the equipment included.

The most complete kit, No. 103, contains six each of the four different size spiders, 4-oz. can of Ambroid, 4-oz. can of solvent, 2-oz. can of special voice coil dope, together with a 2-oz. can of thinner. A special tool for removing filings from the gaps of speakers, a probe for loosening or picking up wires that have been softened by the solvent, a complete set of shims for centering the voice coils and three brushes for applying the cement or dope are also included.—*Radio Retailing*, May, 1935.



Freed Model 469

The newest radio of the Freed Television & Radio Corp., Long Island City, N. Y., is Model 469, an a.c.-d.c. foreign short wave and broadcast set. It is housed in an upright walnut veneer table cabinet with full vision airplane type tuning dial. The set uses a 6A7, 78, 77, 6, 43 and 25Z5 and lists at \$39.95.—*Radio Retailing*, May, 1935.

New Fada Radios

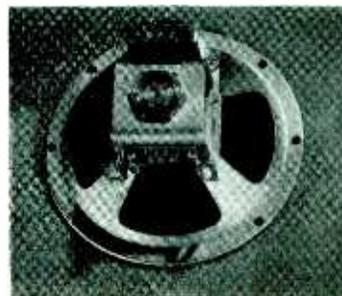
A new table set called the "Super Fadalette," Model 155, is announced by the Fada Radio and Electric Co., Long Island City, N. Y. It is a 5 tube superhet for a.c. or d.c. operation. Tuning range 540-1750 kc. The cabinet is of fine grain walnut and the list price is \$19.99.

Fada has also brought a new 6 tube superhet auto-radio, Model 166, to be known as the "Motostat." The three piece housing facilitates installation and service. Remote control on steering wheel or panel. Built in spark filter to eliminate the need for suppressors. \$49.95.—*Radio Retailing*, May, 1935.

Sonochorde Replacement Speakers

A line of electro-dynamic replacement speakers in four sizes—5, 6, 8 and 11 in.—may be obtained from the Sonochorde Sales Co., 200 Boston Ave., Medford, Mass. Two types of automobile speakers are also available.

Through a wide variety of field and transformer values 741 combinations can be supplied. The diaphragms are of high quality acoustic material and the 5-ohm voice coil is supported by the Sonochorde "wave-form" spider. Normal power, 4 to 12 watts; with reinforced voice coil, 4 to 20 watts. A special assembly method enables any speaker to be completely taken apart, cleaned and reassembled in a few moments.—*Radio Retailing*, May, 1935.



Raytheon Voltage Regulators

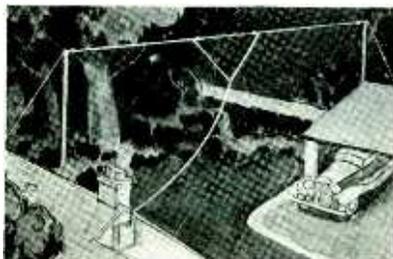
A line of voltage regulators formerly put out under the trade name "Delta" may now be obtained from the Raytheon Mfg. Co., Waltham, Mass.

Owing to the universal characteristics of these regulators and the simplicity of construction they may be incorporated as an integral part of a complete assembly. They range in price from \$27 to \$90.—*Radio Retailing*, May, 1935.

GE "V-Doublet" Antenna System

A unique type of antenna system, the principle of which is based on discoveries made by GE engineers in designing the aerials of shortwave stations W2XAD and W2XAF, is being introduced in the form of a completely assembled kit manufactured by the General Electric Co., Bridgeport, Conn.

It is known as the "V-doublet" antenna system and provides not only more uniform sensitivity in the shortwave bands, but also has characteristics which effect an automatic change-over from shortwaves to standard broadcasts and other longer wavelengths without sacrificing performance and without requiring the use of a switch. In addition it minimizes man-made interference of local origin. The design lends itself to various methods of suspension and is simple to install.—*Radio Retailing*, May, 1935.



Burton Testers

The No. 10 oscillator of the C. W. Burton Co., 755 Boylston St., Boston, Mass., is direct reading and covers all bands. The price including two 30 type tubes but without batteries is \$29.50, net.

The 110-volt a.c.-d.c. all-wave Model 110, same specifications, is \$33.50, net, including a 77 oscillator tube.

The "Master" tube tester is also direct reading. Leakages, shorts and all other defects are shown instantly on the meter dial.

The illustrated counter model is housed in a two-tone walnut finish cabinet and is supported by futuristic ebony finish standards to increase its attractiveness. The "Master" model in either the counter or portable types is \$39.50 net.—*Radio Retailing*, May, 1935.



Ohiohm Low Resistance Carbon Resistors

A new line of carbon resistors obtainable in values as low as .04 ohms, in ratings from 1/4 watt to 10 watts, is now being manufactured by the Ohio Carbon Co., 12508 Berea Rd., Lakewood, Ohio. They are known as the Ohiohm LV series and they conform to the same standards of load, voltage, life, overload and humidity characteristics already set by the company's regular line of carbon resistors of higher ohmic values. In fact, laboratory tests show that these LV units react satisfactorily under humidity conditions much more severe than those specified in the RMA tests.—*Radio Retailing*, May, 1935.



Hammond Globes

Interest in all-wave programs has brought a demand for world globes.

Model 912, made by C. S. Hammond & Co., 360 Furman St., Brooklyn, N. Y., is especially made for the short-wave enthusiast. Two independently moving discs are attached to the base, one a clock disc and the other for logging all important short-wave stations. They help to determine where a program is coming from, make the calculation of time a simple one and show the set operator when and what to dial.

This globe comes in two sizes 9-in. and 12-in.—*Radio Retailing*, May, 1935.



Clough-Brengle Professional Servicer

For the service man who wants everything for testing and aligning modern receivers in one convenient carrying case, Clough-Brengle Co., 1134 W. Austin Ave., Chicago, has just announced its new "Professional Radio Servicer."

This instrument is composed of a Model OC all-wave r.f. signal generator and a Model UE multi-range volt-ohm-milliamperere output carried in a sturdy metal case. The complete instrument as described above is \$58.80. Service men now having a Model OC oscillator may purchase the carrying case for \$4.20 and the Model UE Unimeter for \$23.94.—*Radio Retailing*, May, 1935.

Vibrators

The outstanding differences in construction to be found in the new line of vibrators made by the Oak Mfg. Co., 711 W. Lake St., Chicago, Ill., are in the separate set of driving contacts and in the driving coil, which incorporates a shorted winding for prevention of arcing across the driving contacts. The consequent elimination of wear and oxidation of the driving contacts assures starting under all operating conditions.

This vibrator is available in both synchronous and non-synchronous types, each being only 3 1/8 x 1 1/4 in. Standard 4-prong base mounting is used on the non-synchronous and standard 6 prong base mounting on the synchronous type.—*Radio Retailing*, May, 1935.

Hartman 32 Volt Converter

To convert 32 volt battery current to 110 volt a.c., the Hartman Electrical Mfg. Co., Mansfield, Ohio, has brought out a new model of its converter. With this device an a.c. set can be used where only 32-volt current is available.

It is enclosed in a substantial metal case lined with sponge rubber to insure quiet operation, and furnishes the complete current requirements for the radio receiver. The case measures 4 1/2 x 5 1/2 x 7 1/2 in. and can usually be installed within the console type cabinet.

The prices are No. 32, 32 to 110 volts, 85 watts, \$16; No. 6, 6 to 110 volts, 60 watts, \$15 and No. 6A, 6 to 110 volts, 75 watts for sound truck amplifiers, \$18.—*Radio Retailing*, May, 1935.



Hartman Converter (above)

Muter Tuning Coupler (below)



Muter All-Wave Tuning Coupler

With the approach of summer with its increased static, the Muter Co., 1255 S. Chicago Ave., Chicago, has brought a new all-wave tuning coupler to meet the demand for a unit to match up any radio set with a doublet antenna system.

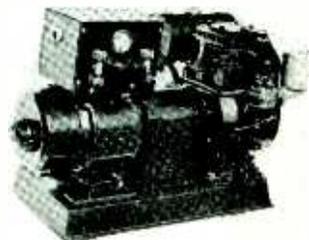
Complete and simple instructions are included for home construction of an inexpensive doublet antenna. This tuning coupler will work on both the shortwave and the 200-550 meter broadcast band. Changeover from shortwave to broadcast reception is accomplished by a simple switching arrangement.—*Radio Retailing*, May, 1935.

Kato Lighting Plant

A new model has been added to the line of a.c. lighting plants made by the Kato Engineering Co., Mankato, Minn., known as the 24-A, 750 watts. It can be made self cranking by simply connecting to starting batteries. Direct current to excite speaker fields and charge batteries is available from all Kato a.c. plants. Remote control may be attached or detached in a few minutes' time.

Provide standard 110 volts a.c. current. Burn gasoline and kerosene. The Kato people have developed a new type of mounting which eliminates the necessity of bolting the plant down.

Kato also offers a complete line of rotary converters for changing 6, 12, 32 and 110 volts d.c. to 110 volts a.c. They also make a complete line of 32-volt plants.—*Radio Retailing*, May, 1935.



Pierce-Airo Price Correction

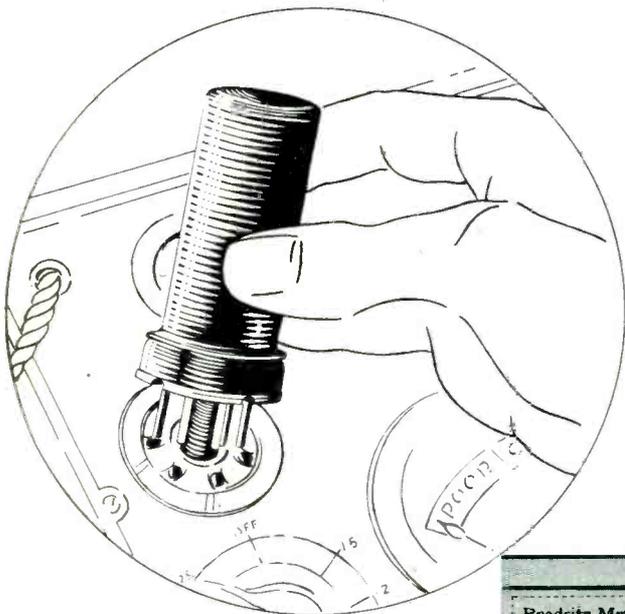
The price of Model 605 auto-radio of Pierce-Airo Inc., 510 Sixth Ave., New York, is \$44.95—not \$64.95—as shown in the specifications in the April issue.—*Radio Retailing*, May, 1935.

Be Prepared



F. E. Wenger, Radio Engineer of the *Readrite* Meter Works, says: "The question of servicing the new type Octal metal tube is important to every service man. *Readrite* tube testers, now in service, can easily be adapted for the new Octal tubes." Simply get in touch with your jobber, or communicate directly with the *Readrite* Meter Works for full information of this newest testing equipment.

...TO TEST THE NEW METAL TUBES!



THE tube situation has changed. Metal tubes are here! Will you be prepared to test the new Octal metal tubes when you are called upon to do so—or, will you have to tell your customer: "Sorry, Mr. Jones, my equipment is not capable of handling the new tubes." Be prepared! See the new *Readrite* Model No. 430 Tube Tester . . . at your jobber's. It has been especially designed to handle every type of tube—both with metal or glass envelope . . . accurately and speedily. Constructed with sloping panel and removable cover for either counter or portable use.

The Model No. 430 has five sockets, that are flush with the panel. One socket is equipped to test the new 8-Prong Octal metal tube. Another feature of this new tester is the shadow-type line voltage meter . . . located directly above the moving-coil type instrument used for testing Good and Bad tube values. Direct reading. Controls are simple and positive in action. This new all-type tube tester makes every inter-element short and leakage test, which is instantly convincing to the customer.

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GREENWOOD, MISSISSIPPI

U.S.A.

April 6, 1935

Supreme news-flash re new all-metal tubes:

The sudden announcement of new all-metal tubes having an entirely different base arrangement, and as many as 8 prongs, naturally grips the attention of professional radiomen whose policy it is to keep their service as modern as new set design.

So far as Supreme is concerned, it means the earlier announcement of new instruments on which our engineers have been constantly working during the past 8 months. Entirely new designs incorporating several interesting developments that were being held for Fall announcement will now be immediately available in instruments built for the new service.

This assures you, therefore, that we do not merely offer present models hastily revamped because of sudden tube designs, but, rather, finished products on which research, engineering and thorough field tests have already been completed. Adaptability to the new tubes and circuits will be but a minor feature of these new 1936 models. We are going to show you something absolutely new.

So expect a lot of these new Supreme instruments. An entirely new standard of value and engineering leadership. PLUS innovations galore. Your jobber will soon have these new 1936 instruments that are truly Supreme's greatest line of radio testers. Meanwhile, you will want to have immediately the inside technical story which is ready, awaiting your inquiry. Written by engineers who have done the radioman's work, who speak his language, and know his pride in up-to-date equipment. Write, right now, and learn all about your next Supreme.

Yours very truly,

A handwritten signature in dark ink, appearing to read "A. A. [unclear]", written in a cursive style.

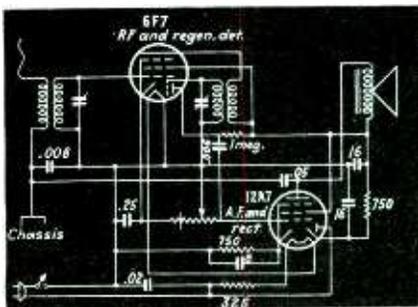
President.

SERVICE SECTION

Conducted by
W. MacDonald

Including
Installation Data

CIRCUITS of the MONTH



Cabinet Front is Speaker Diaphragm

Crosley's Model 2-C-1, equipped with a magnetic speaker, uses the front of the cabinet itself as the speaker's diaphragm. When servicing the set unsolder the drive rod from the speaker motor to remove the chassis from the cabinet. "Hydrolene," not glue, is used to fasten the front in the cabinet.

The entire circuit of this receiver is shown as it is a two tube affair of general interest because of its compactness. The pentode section of the 6F7 acts as a t.r.f. stage. R.f. is passed by transformer action to the triode section of the tube, hooked up as a regenerative detector. The 1 meg. resistor constitutes the detector's plate load.

A.f. is passed from the output of the detector to the control grid of the 12A7's pentode section through the .006 coupling condenser. The 6F7 is controlled, both sections, by the variable volume control which permits adjustment of bias on this tube and at the same time serves as grid resistor for the final pentode. The 12A7 is self-biased.

Resistance-capacity filtering is employed, together with the usual a.c.-d.c. series heater circuit, including a cord dropping resistor and a .02 hum modulation suppressor condenser.

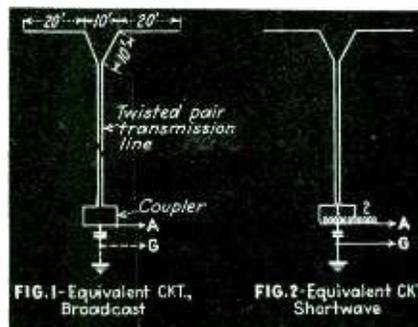
Matched Impedance Antenna

GE's new "V-Doublet" antenna system uses a twisted pair transmission line, the "surge impedance" of which we estimate to be somewhere in the neighborhood of 100 ohms. For maximum sensitivity in the shortwave bands this line is used in conjunction with a

doublet flat top resonating, because of its two 20 ft. sections, in this part of the spectrum.

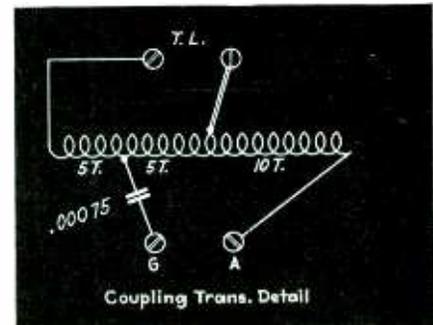
Amateurs, particularly those who have been fooling around on 5-meters, know that in order to limit pickup to the flat top portion, avoiding pickup by the transmission line itself, the roof end of the line must be terminated in about its own impedance. Otherwise "reflection" occurs and the line, or part of it, becomes "hot." The "V-ing" at the top accomplishes this.

The impedance of the two inside ends of the doublet (spaced 10 ft. apart) is far higher than the required 100 ohms but by tapering the leads between doublet and line a suitable match is obtained. The impedance of the two tapered leads is sufficiently high to match the doublet because of the wide spacing at the junction point. And, inasmuch as the impedance of these two leads declines as they are brought closer and closer together it is satisfactorily low at the junction with the line. Simply



explained, the V section acts as a transformer, one end matching the relatively high impedance doublet, the other matching the relatively low impedance line. On shortwaves, therefore, there are no violent "standing waves" on the line due to proper impedance matching at the roof.

The transformer between line and set is designed to achieve doublet antenna action (downleads "cold") when operating on shortwaves and "T" type operation on broadcast, transmission line and flat top operating as a conventional single wire fed system on the lower frequencies. This is accomplished electrically, without switching. The explanation is as follows:



When the system operates at broadcast frequencies the transformer windings, because of the relatively small number of turns, have practically no impedance, hence the two transmission line wires are effectively shorted together. The .00075 capacitor has a reasonably high impedance and bypasses little r.f. to ground. The equivalent circuit at broadcast frequencies, therefore, looks like Fig. 1.

At shortwaves the impedance of the coils is relatively high, so the two transmission line leads actually work as a transmission line, in-phase noise voltage induced in them being bucked out and passed to ground through the condenser, which at high frequencies has relatively low impedance. Signal voltage, picked up by the flat top and not by the transmission line, is simply carried by the line down to the transformer section 1, passed by the auto-transformer action of section 2 to the antenna post of the receiver.

This electrical "switching" action gives the system a desirably flat response characteristic over both shortwave bands and the broadcast band. The doublet top probably "adjusts its own length" quite well, depending upon frequency, using more or less of the tapered section leads, and even the transmission line itself, as part of the antenna as the frequency of the received signal is lowered.

Vacuum Tube Voltmeter

We print this circuit diagram of Clough-Bregle's new UC type vacuum tube voltmeter despite the necessity of



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Servicemen who use the Weston method of *Selective Analysis smile when these new developments are announced. They don't have to dig into their jeans to buy new instruments, for tube changes have no effect on the serviceability of the Weston Selective Analyzer. A new tube base simply means a small, inexpensive unit for the socket selector. The analyzer itself serves for all present and all future tubes.

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ing, the Weston Selective Analyzer was designed with an eye to the future . . . with full regard for *all* problems of the serviceman. That's why Weston users today have no worries over analyzer obsolescence, or instrument dependability. That's why far-sighted servicemen insist on Weston Selective Analyzers, and other Weston instruments, for all servicing needs . . . Weston Electrical Instrument Corporation, 581 Frelinghuysen Avenue, Newark, New Jersey.

The *Selective Method of Analysis is a Weston contribution . . . and is now available in three analyzer models, in price ranges to suit any pocketbook. The coupon will bring you complete information. Send it today.

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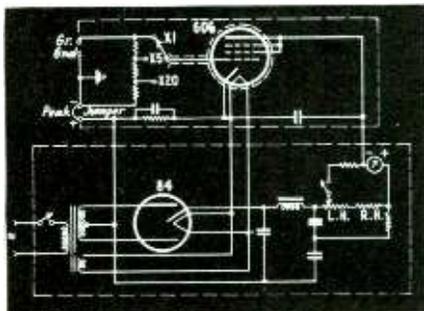
WESTON ELECTRICAL INSTRUMENT CORP.
581 Frelinghuysen Avenue, Newark, New Jersey.
Send full data on WESTON Selective Analyzers and other WESTON Radio Instruments.

Name

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SERVICE SECTION



omitting constants, as it is an excellent example of a type sufficiently rugged, and sufficiently sensitive and accurate for all practical service shop uses. Don't write us for resistor and condenser sizes, please.

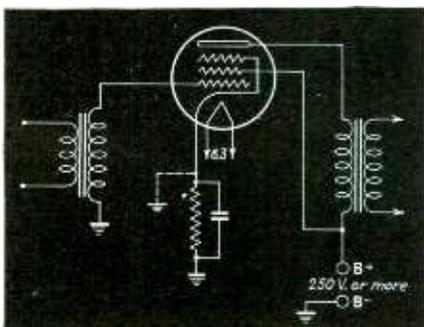
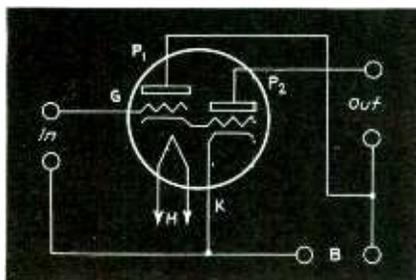
A moving coil meter is used and potentials of .2 volts, under 2,000 kc., may be read with ease. Accuracy is within 2 per cent of full-scale or better. It is within 4 per cent at 3,000 kc., 5 per cent above 4,000 kc.

Input resistance is practically infinite on the lowest scale. The shunts used on the others do not reduce it to less than 2 megohms.

"Triple-Twin" Type Requires No Bias Resistor

Triad has introduced a new version of the "Triple-Twin" tube type, a Class A triode driver and Class A triode power output directly coupled within the one envelope. Unlike early models, it requires no bias resistor. Because the load impedance is 7,000 ohms, physical size and base identical with that of a 42-pentode, the 6B5 may be substituted with relatively simple circuit changes only.

Figure 1 shows the schematic of the



tube. Figure 1 shows it substituted for a 42. Note that it is necessary only to ground the cathode. The original screen-grid lead supplies P₁. 250 volts plate is recommended for full power output, but the tube will work satisfactorily with 200.

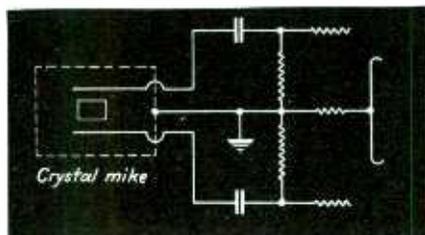
Characteristics are as follows:

Heater voltage (a.c. or d.c.)	6.3 volts
Heater current	0.8 amps.
Plate Supply (Max.)	300 volts
Plate Current (P ₁)	8 mils.
Plate Current (P ₂)	45 mils.
Load Impedance	7000 ohms
Power Output	4 watts*

*5% harmonic distortion

Pin connections, looking at the bottom of the base and reading clockwise from the two heater pins are: Heater, heater P₂, P₁, input grid, cathode.

Where a 42 is fixed-biased it is necessary to simply ground the low potential end of the input load device, removing the bias. Two 6B5's can also be used to replace two 42's in push pull. Simply ground the cathode and otherwise follow the circuit of Figure 2.



Push-Pull Crystal Mikes

The Turner Company of Cedar Rapids, Iowa, is putting through type G and Dia-Cell high-impedance crystal mikes for push-pull input, where desired. The instruments are furnished with two-conductor, low-capacity cable with a shield over both conductors and rubber insulation overall.

The advantages of the arrangement are lower line losses and decreased tendency to pick up a.c. hum and other line noises. As much as 150 feet of cable can, we understand, be used.

Metal Tube Characteristics

Tentative characteristics of 6 RCA-made, GE-designed metal tubes are as follows:

6A8 Pentagrid Converter

Heater voltage (a.c. or d.c.)	6.3
Heater current	0.3
Plate voltage (max.)	250
Screen voltage (Grids 3 and 5)	100
Anode Grid voltage (Grid 2)	200
Control grid voltage (Grid 4)	-3
Total cathode current	14

Pin connections, looking at bottom, reading clockwise after insulated pin locator (pin locator is between cathode and shell pins): Shell, heater, plate, 3 and 5 grids, grid 1, grid 2, heater, cathode. Top cap is grid 4.

6C5 Detector Amplifier Triode

Heater voltage (a.c. or d.c.)	6.3
Heater current	0.3
Plate voltage (max.)	250
Grid voltage	-8
Plate current	8
Plate resistance	10000
Amplification factor	20
Mutual conductance	2000

Pin connections, looking at bottom, reading clockwise after insulated pin locator (pin locator is between cathode and shell pins): Shell, heater, plate, grid 1, heater, cathode.

6D5 Power Amplifier Triode

<i>As Single-Tube Class A Amplifier</i>	
Heater voltage (a.c. or d.c.)	6.3
Heater current	0.7
Plate voltage (max.)	275
Grid voltage	-40
Plate current	31
Plate resistance	2250
Amplification factor	4.7
Mutual conductance	2100
Load resistance	7200
Undistorted power output	1.4

As Push-Pull Class AB Amplifier

Plate voltage (max.)	300
Grid voltage (fixed bias)	-50
Plate current (per tube)	23
Load resistance (plate to plate)	5300
Power output	5
Pin connections, same as 6C5	

6H6 Twin Diode

Heater voltage	6.3
Heater current	0.3
A.c. voltage per plate (rms) (max.)	100
D.c. output current (max.)	2

Pin connections, looking at bottom, reading clockwise after insulated pin locator (pin locator is between cathode and shell pins): Shell, heater, plate 2, cathode 2, plate 1, heater, cathode.

6J7 Triple Grid Detector Amplifier

Heater voltage	6.3
Heater current	0.3
Plate voltage (max.)	250
Screen voltage (grid 2) (maximum 125)	100
Grid voltage (grid 1)	-3
Suppressor (grid 3)	
Connected to cathode at socket	
Plate current	2
Screen current	0.5
Plate resistance. Greater than 1.5 meg.	
Amplification factor. Greater than 1500	
Mutual conductance	1225

Pin connections, looking at bottom, reading clockwise after insulated pin locator (pin locator is between cathode and shell pins): Shell, heater, plate, grid 2, grid 3, heater, cathode. Top cap is grid 1.

6K7 Triple Grid Super Control Amplifier

Heater voltage (a.c. or d.c.)	6.3
Heater current	0.3
Plate voltage (max.)	250
Screen voltage (grid 2) (Maximum 125)	100
Grid voltage (grid 1)	-3
Suppressor (grid 3)	
Connected to cathode at socket	
Plate current	7
Screen current	1.7
Plate resistance	0.8 meg.
Amplification factor	1160
Mutual conductance	1450
Grid voltage (for mutual of 10 micromhos)	-35
Grid voltage (for mutual of 2 micromhos)	-42.5
Pin connections same as 6J7.	

Coming soon: Full-wave rectifier, mixer, Class B twin amplifier, power amplifier pentode. All bases are "Octal," requiring new type socket accommodating uniform thickness tube base pins and center insulated "locator."

Date of release to public, tubes described in characteristic charts above and referred to in the preceding paragraph, not yet determined.

HOW TO GET THE MOST OUT OF YOUR TEST OSCILLATOR

Using the instrument to locate trouble in r.f. amplifiers, test small capacitors for continuity, ferret out mixer grief, adjust a.v.c. circuits, trace tunable hum, flat-top i.f. stages and make fidelity graphs

By O. J. MORELOCK, JR.
Radio Engineering Division,
Weston Electrical Instrument Corp.

THE testing of all types of equipment in use today is centering around measurements taken when the equipment is operating under load. New test boards used in automotive repair stations test compression, timing and other functions of automobile engines, while they are running.

While a radio set is not a dynamic piece of machinery, it is analogous to an automobile engine in that many parts run in an electrical field rather than in a mechanical one. Following along this same line, it seems reasonable to expect that dynamic tests on a receiver, with a signal passing through, it would be of extreme value. Static tests may indicate that potentials on the electrodes of the various tubes are of the correct value. But they do not indicate what happens to the a.v.c. circuit when a signal is presented to the second detector tube, nor do they indicate the condition in the receiver oscillator circuit, etc.

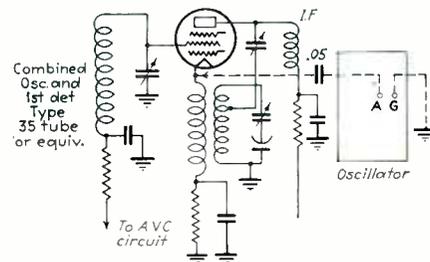
The average well-equipped serviceman, although he may not realize it, has at his command, in the form of a test oscillator, the means for making these tests without going to the expensive outlay equivalent to that of a motor test board. Some of the very helpful uses that this oscillator may be put to in analyzing a receiver, are outlined in the following paragraphs.

Trouble in R.F. Amplifiers

In checking a receiver of the superheterodyne variety, a very quick analysis can be made without removing the chassis from the cabinet, by making use of the test oscillator. Perhaps the first thing to do in analyzing such a set where a very weak signal is apparent, or where no signal at all is available, is to remove the second detector tube and note whether or not a

click is heard in the speaker. If continuity is indicated through the audio section of the receiver by this sound it is reasonable to expect the difficulty to be in the r.f. portion of the receiver.

By connecting the oscillator to the grid of the tube preceding the first detector,



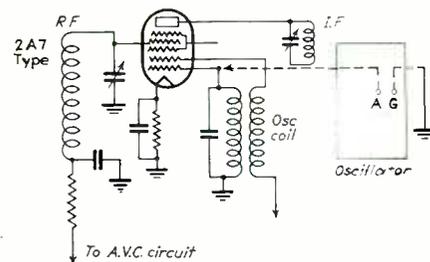
Substituting external oscillator for Autodyne

and tuning the oscillator to the intermediate frequency, a signal should be heard in the speaker, indicating that the set is functioning correctly from this point on. If no signal is heard, the trouble is probably occurring in this circuit, and an analysis with a volt-ohmmeter of the plate, grid, screen and cathode circuits surrounding this tube should be made, to segregate the individual defective part. If continuity is indicated from this point on, the oscillator should be connected to the grids of the preceding tubes with a resultant gain in each case, working back to the first detector tube grid. In this way continuity can be quickly checked back to this point, and as soon as the tube is found where no signal passes through it should be investigated for trouble.

Likewise by changing over to the broadcast band, the r.f. section of the receiver can be checked back to the antenna and ground terminals of the receiver.

Testing Small Capacitors

Radio frequency by-pass condensers having small capacity values are difficult to



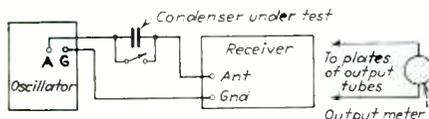
Substituting external oscillator for oscillator of duo-purpose 2A7

check for continuity and often cause no end of trouble in superheterodyne oscillator circuits or as by-passes. These condensers can be checked by using an oscillator and a receiver, the latter being turned on and a signal from the oscillator being tuned in. The hot or antenna lead can then be disconnected, and the small condenser under test can be placed in series with the oscillator antenna lead and connected to the antenna post of the receiver. If no signal comes through, it is obvious that the condenser is open and has been the source of trouble. If the signal is much weaker than before, and the reactance of the condenser is such that it will have an impedance of several hundred ohms, at the oscillator frequency a weaker signal will be noted in the receiver due to this impedance being introduced into the antenna circuit. This however will still indicate that there is continuity through the condenser and that it should function correctly in a receiver. This method is extremely helpful in checking condensers having capacities of 25 to 1,000 micro micro farads.

Superhet Oscillator Circuits

Occasionally a receiver is found to show continuity from the first detector grid through to the speaker, when tested, but will show no indication when a signal is fed into the antenna and ground terminals. This condition is nearly always due to trouble in the superheterodyne oscillator section and the oscillator tube has probably ceased to function. If the set contains a converter tube such as the 2A7 or equivalent, the test oscillator should be connected to the No. 1 grid socket terminal of this tube and ground, and an unmodulated signal fed in on the broadcast range of the oscillator.

By manipulating the oscillator tuning control a broadcast signal should appear at some point, indicating that substitution of an external oscillator for the one in the receiver clears the trouble. If the receiver has a combined oscillator-first detector tube, such as the type 35 or equivalent, where the oscillator coil is connected in the cathode circuit of the tube connection should be made from the output of the oscillator to the cathode socket terminal of the tube and ground. If the receiver employs a separate oscillator tube, connections should be made through a series condenser having a capacity of approximately .002 mfd. to the plate socket terminal of the



Testing small capacitors for continuity

SERVICE SECTION

oscillator tube. If substitution for the receiver oscillator clears the trouble, the oscillator circuit should be checked carefully for continuity. Often the trouble is in the cathode resistor of the converter tube and would be cleared by substituting a new one or one of lower value. An open by-pass in this same circuit would also cause trouble.

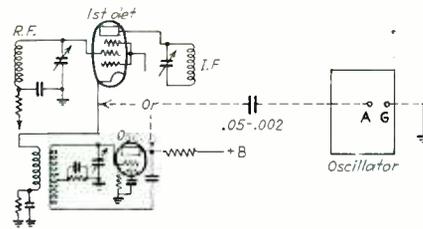
A.V.C. Circuits

As automatic volume control circuits are regulated purely by incoming signal, it is only possible to study the action of such circuits by making use of a controlled input signal. For alignment procedure the a.v.c. action should be stopped, either by pulling out the a.v.c. tube or by disconnecting the a.v.c. voltage control lead to the grid circuits of the various tubes. It is not always possible to kill the a.v.c. by removing a tube, because in many receivers several functions are combined with a.v.c. control in the same tube such as, for instance, the 55. Likewise it is not always convenient and is often dangerous to disconnect or open the a.v.c. circuit by meddling with the set wiring.

The only other way to nullify the a.v.c. control is to work with an oscillator signal of such a low magnitude that it will not work the a.v.c. tube. To work at such a low level, a very well shielded and carefully designed oscillator is required, as many receivers on the market today have sensitivities around one micro volt or lower where the a.v.c. action may take place at an average of 4 or 5 micro volts. In selecting an oscillator, it is extremely important to look out for this factor as a receiver aligned with the automatic volume control functioning will be as broad as a barn after the job is finished.

Likewise an oscillator with a well designed attenuator is important in studying automatic volume control affects, as a wide range of attenuation allows for observation over a broad automatic volume control range.

In testing A.V.C. circuits the oscillator should be connected to the antenna and ground posts of a receiver and a signal of low volume fed into the set. If the receiver does not have a tuning indicator or a tuning light, it is often advantageous to connect a milliammeter into the plate circuit of one of the controlled tubes. As the oscillator attenuator setting is decreased or in other words as a stronger signal is fed into the receiver, a reduction in plate current should be noticed on the milliammeter if the circuit is functioning normally. As the signal is brought up to higher values it may be noticed that the milliammeter indication ceases to decrease. This indicates that the a.v.c. action is cutting off at a definite value and requires some adjustment. In many sets this adjustment is accomplished by tuning a circuit resonant to the intermediate frequency of the receiver. If this trimmer adjustment is available it should be made at this time by feeding in a fairly strong signal to the receiver and adjusting this trimmer condenser for the *minimum* plate current indication on the milliammeter, tuning meter or tuning light. Such an adjustment will greatly increase



Locating trouble in superhet oscillator circuits (separate oscillator tube)

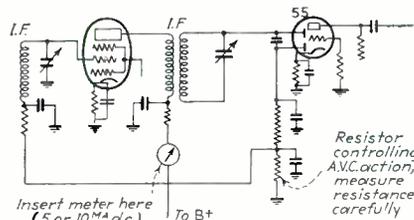
the efficiency of the a.v.c. circuit and will definitely lower noise level or, rather, will improve the signal-to-noise ratio of the receiver.

If no adjustment is available for increasing the a.v.c. action when it appears to cut off with a signal of moderate strength the resistor in the diode plate or diode detector circuit, the drop across which regulates the bias on the controlled tubes, should be checked carefully for its resistance value. The usual resistor used in this circuit has a value of one megohm although this will vary in receivers of different makes. If this resistor seems to be correct and a cut off point is noted in the a.v.c. action the other components of the controlling circuit should be checked.

In making these measurements and adjustments it should be understood that the signal fed in from the test oscillator should not be much stronger than the maximum signal normally appearing on the antenna. This comparison can be made by tuning in the strongest station in the locality and noting the deflection on the tuning meter or the brilliance of the tuning light, and then reconnecting the oscillator and adjusting the attenuator to give the same meter deflection or tuning light brilliance. On a good oscillator it is possible to obtain a signal too strong for any a.v.c. control to handle.

Locating Hum

One of the most difficult hum sources to trace is that known as tunable hum, a very annoying condition that can spoil radio reception. A receiver will appear to function normally with a very low hum level between stations, but when a signal is tuned in a strong hum will be noted in the speaker. The only way to trace this hum down quickly and locate the source of trouble is to connect a battery operated oscillator to the antenna and ground posts of the receiver and feed in an unmodulated C.W. signal. With the receiver tuned to the oscillator signal, a loud hum will be noted with no modulation superimposed on the carrier to upset measurements. By



Testing and adjusting a.v.c. circuits

connecting an output meter through its series condenser from plate to plate of output tubes or from plate to ground a hum indication will be obtained on this meter. By leaving this instrument in the circuit with the oscillator turned on, additional by-pass and filter condensers can be substituted in the circuit with a notation made as to whether or not they decrease the reading on the output meter. Hum on station is usually due to one of the following causes:

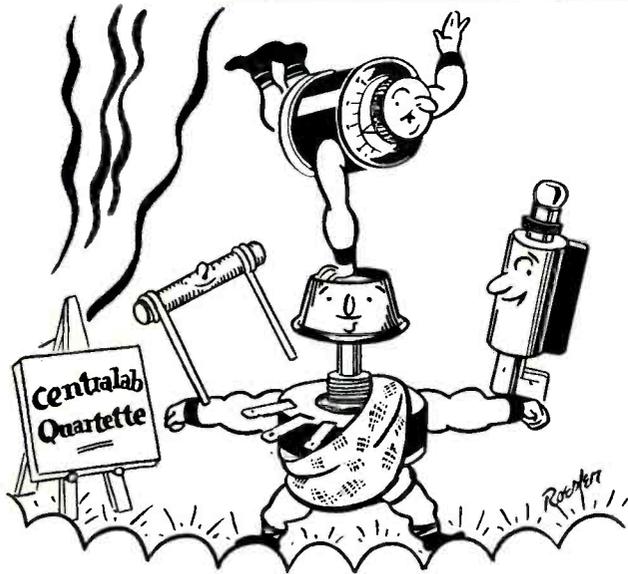
- 1—Insufficient power supply filtering.
- 2—Insufficient screen and cathode by-passing either at the voltage divider or at the tube sockets.
- 3—A tube having bad cathode leakage.
- 4—Modulation of the carrier due to proximity of one of the R.F. grid leads to a filament or primary lead carrying 60 cycle alternating current.
- 5—Open by-pass condensers.

A battery operated oscillator is definitely required for measurements of this type as any a.c. oscillator has a definite amount of 60 cycle carrier modulation, this in most cases, causing a definite indication on the output meter. To be absolutely sure that the hum modulation of the carrier is occurring in the receiver, it is necessary to use a battery operated oscillator.

Flat Topping I.F.

With continually increasing discussion coming up in connection with high fidelity receivers and circuits, the requirement for flat topping with resultant increased audio frequency response, is often called for. This can be done very simply with a good oscillator and output meter, by connecting the oscillator to the grid terminal of the first detector tube and tuning in an i.f. signal. For best results in making this alignment, the a.v.c. tube should be pulled, if it is a separate tube, and a low signal should be fed into the first detector circuit so that it will function below the a.v.c. control point. An output meter should be connected to the receiver and an indication obtained at approximately 2/3rds scale deflection. If the i.f. amplifier has not already been aligned this should be done at this point, all circuits being peaked for maximum deflection at the rated intermediate frequency called for by the manufacturer.

Having made this alignment, the oscillator control should be adjusted to a frequency approximately 2.5 or 3 kilocycles below the required i.f. frequency, i.e. if the receiver requires an i.f. frequency of 456 kc. the oscillator should be adjusted to 453 kc. A resultant decrease in deflection will be noted on the output meter. One of the trimmer condensers should then be adjusted to bring the output meter reading up to as high a value as possible. This trimmer should then be left alone and the oscillator control set for a frequency 3 kc. higher than the intermediate frequency, i.e. 459 kc. and similar adjustment made on another trimmer condenser. It should then be noted when the test oscillator control is manipulated back and forth over about 5 kc. a relatively flat characteristic is noted, or in other words, the output meter reading remains reasonably constant. Of course it should be understood that this adjustment will decrease the sensitivity of the



Here's a "Troupe" that Wows 'Em!

Four husky boys, these, that have been on most of the world's best circuits.

Fathered by old man Radiohm himself, he and his three sons Kid Suppressor, Kid Resistor and the new member of the team, Big Boy Sound Projection Control, are in the spot light of popularity with servicemen and experimenters everywhere.

How these boys can work! It's a pleasure to watch 'em . . . smooth, efficient, noiseless and each performance as reliable as the next.

NOTE: Mr. Trouble Shooter . . . stock up with Centralab Replacement parts . . . the cheapest in the long run.

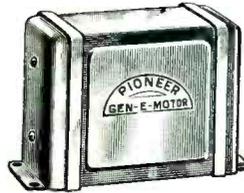
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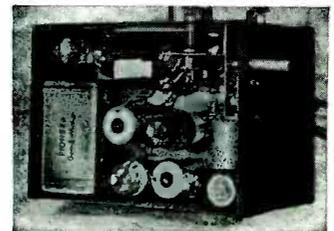
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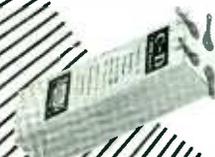


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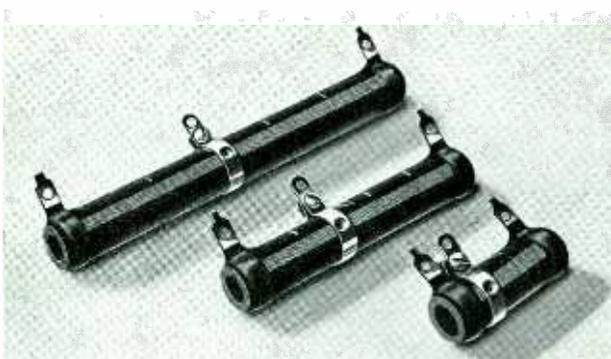
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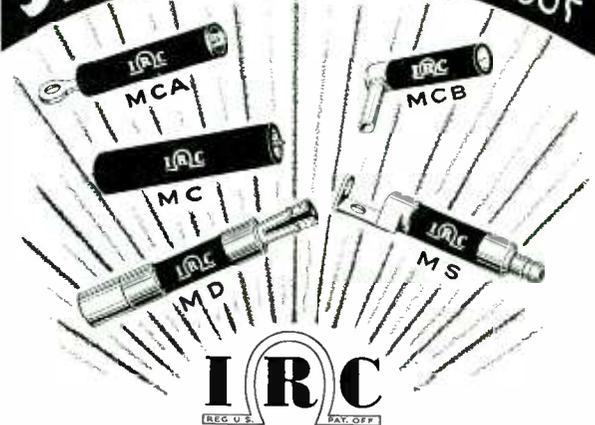
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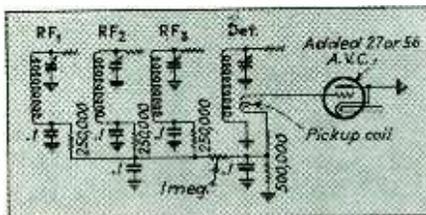
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JOHN F. RIDER, Publisher
1440 Broadway New York City

MODERNIZING THE OLD ONES

NUMBER 1—Atwater Kent

AVC (Early and late types 55, 55C; early, late and third 60, 60C; third type 66) Mount five-prong socket near detector coil. Remove shields of all r.f. coils and disconnect all but detector grid returns. Make a scramble or bank-wound coil of 125 turns one fourth the length of the detector coil and small enough to slip inside the ground end. Number 32 s.c.c. or d.s.c. wire is ok.



Connect as shown in the accompanying diagram, wiring in the indicated filter resistors and condensers and the 1 megohm a.v.c. load resistor.

VOLUME CONTROLS (Early 55, 55C, 60, 60C) Connect red wire to red-with-black-tracer. Connect 10 watt resistor of same value as wire-wound portion of control to white wire and junction of two above. Use shortest possible connections. (Late 55, 55C, third 60) Include 10 watt resistor as outlined above. Remove black-with-red-tracer and blue wires entirely. (Late 60, 60C and 66) Connect 10 watt resistor of same value as wire-wound portion of control between red and white wires. Remove blue wire entirely. Connect black and black-with-white-tracer together. These changes give maximum screen voltages of permanent value and maximum r.f. gain similar to maximum setting of control. Mount a new 250,000 ohm resistor having a taper such as the Centralab No. 5 in place of the original. Remove the grid resistor (blue in all models except late 55 and third type 60 and 60C) of the first a.f. tube, connect outside terminals of control in place of it and connect control grid of a.f. tube to center arm.

LOCAL-DX SWITCHES (Early 55, 55C, 60, 60C) Connect yellow and blue wires together. Remove red-with-white-tracer wire entirely. (Late 55, 55C) First connect heavy and light green wires together. Remove remaining wire entirely. (Late 60, 60C) Connect green to green-with-yellow-tracer. Remove other wire. (Third type 60 and 60C) Remove red wire and blue-with-white-tracer entirely. Use white-with-black-tracer as grid return in a.v.c. circuit de-

scribed above. These changes make permanent connection in the dx position. A twisted pair is then connected to the switch so that the ends next the switch may be connected together with the switch thrown to the right and the circuit broken when the switch is thrown to the left. The other end of the pair is connected in a break in the lead from the short antenna post to the tap on the antenna coil.

OTHER CHANGES. Connect a .01 condenser from junction of detector

coupling resistor and r.f. choke to ground. This will improve low frequency response. Substitute a 56 for the first a.f. 27. Replace coil shields, put 35 tubes in the sockets in place of the original 34's, remove a.v.c. tube and align in the usual manner according to the manufacturer's instructions. When connecting changed wiring together to make variable portions of circuit permanent run all connections as directly as possible and avoid splicing. Make changes from one soldering lug to another and remove excess wire.

SHOP SHORTCUTS

Temporary 32-Volt Supply

By Jim Kay

Many shops located out in semi-rural areas have occasion to service 32-volt d.c. receivers occasionally. The following system of obtaining supply voltage for quick tests is recommended.

Hook three or four heavy-duty 45 volt "B's" in parallel, then connect an old "A" eliminator choke and a 2 ohm rheostat in series. Most sets draw between 2 and 3 amperes and the setup described will supply the proper operating potential for short periods.

It should, of course, be used for very short periods. Batteries will stand the drain for only about 15 minutes but good ones will build up again rapidly when the load is removed. Use point-to-point analysis for locating trouble and then hook up the supply system described for quick alignment work and check for hum level and tone quality.

If 32 volt sets are continuously serviced some permanent supply source is, of course, advisable.



with a homemade combination tube checker and tube stock carrying case.

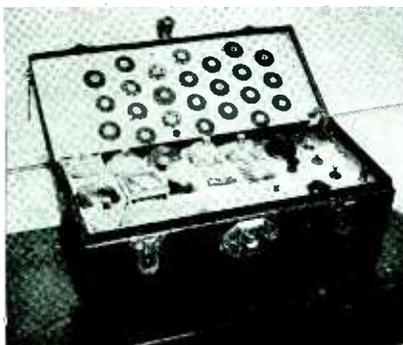
I have built a checker into an ordinary metal toolbox, as shown in the first photo. Transformer, switches and tip-jacks are included at one end, sockets for different tube types in the cover. The two sections of the checker itself are interconnected by means of a flexible cable on the hinged side (at right) and the meter is simply patched into the checker by means of patch cords normally carried in the space provided in the analyzer carrying case.

There is plenty of room in the checker for carrying 15 tubes, which may thus be readily shown the customer on home calls and tested right before his eyes.

Portable Tube Checker

By Frank R. Dickinson

Most set analyzers include a milliammeter with a 5 ma. range. This is excellent for external use in conjunction



Extra Speaker for Peerless Or Cutting Equipped Sets

By J. B. Cook

When a remote, extra speaker must be connected to sets using Peerless or Cutting dynamic speakers, such as the Colonial, it is not possible to silence the speaker included in the set by ordinary means as it has a voice-coil consisting of a single turn of heavy copper.

I obtain another output transformer like the one already used in the set, connect it up as shown. A magnetic speaker is hooked up through blocking condensers to the primary of the new trans-

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Model 300—Multirange Meter—A.C. and D.C. volts to 1000—Resistance can be read from 1/2 ohm to 10 megs D.C. Milliamps to 500 Ma.—No binding posts—Only one switch—Complete with cords and polarized test prods—\$19.95.

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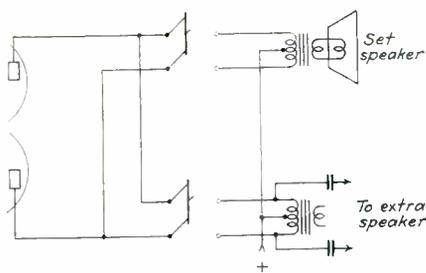
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former (1 mike condensers are more than adequate), the secondary remaining unused.

Either speaker may be used without the other. Or both may be used at once since the paralleling of transformer primaries does not reduce the load impedance in the push-pull output stage sufficiently to materially disturb volume. Voltages are unaffected and the output tube drain remains normal.

Removing Metal Particles From Speakers

By J. L. Johnson

To remove metal particles from the gaps of dynamic speakers obtain a magnet from a discarded magnetic speaker. Allow a thin piece of steel or iron such as a knife blade or spring to adhere to one of the magnet poles, projecting out about one inch. This forms a sharply pointed continuation of the pole.

After removing the voice-coil and cone, necessary in most cases, insert the probe into the gap. Small particles which cannot be removed by the air-blast or pipe cleaner method will readily be attracted by the probe. The magnetism of almost any magnetic speaker magnet will be adequate to overcome the residual magnetism of the dynamic speaker field housing.

Colored Dial Lights

By E. P. Waldo

Recently I bought some red and green dial lights. They were of foreign make and promptly "went west" when installed in customers' receivers, necessitating frequent callbacks. I simply had to make good and inasmuch as I had done a good selling job when originally recommending the colored lamps, clear ones no longer satisfied.

I bought some regular nail polish from the dime store. This was a sort of lacquer. Almost any color could be obtained. Red and green proved the best for customer satisfaction. I colored some good, reliable lamps with this lacquer, clamping a battery clip on them to permit them to be hung up while drying.

Just showing them on service calls sold many at 25 cents each.

TRICKS of the TRADE

AMERICAN BOSCH 360 SERIES.

Intermittent oscillation . . . Tube shields are made of aluminum composition and after being in service for some time corrode where they fit on the shield base. Drill a small hole through the side of each shield and through the base, then insert a small self-threading Parker Kalon screw and the oscillation will generally cease.

AK 80.

Intermittent operation . . . Rub pencil eraser around top of tube sockets before looking elsewhere for trouble. Twisting of tubes on socket in order to find the correct position removes enough solder from the tube prongs to make a high resistance short between socket holes and this is frequently enough to kill the oscillator tube.

BRUNSWICK 15, 22, 32. Rushing sound like steam escaping, particularly noticeable on lower end of dial . . . Remove shunt condenser from local-distance, push-pull type switch.

FORD 35. Dial jumps calibration . . . Remove cog-wheels from dial assembly. Lightly beat out cog-wheel which holds pointer with hammer until it thoroughly meshes with intermediate driving gear.

GRUNOW 1101. Volume on full all the time, no control . . . Replace remote control cable or remove short between blue wire and metallic shield over black wire. (IF 262 kc.)

GRUNOW 11A. Oscillation . . . Drill out rivet used for mounting shield and socket of 6C6, replacing the rivet with a 6/32 brass machine screw. The placing of a soldering lug under this screw on the underside of the chassis and grounding of this lug to chassis does the job without disfiguring the radio.

MAJESTIC 50. Set dead, no plate voltage on second detector but all other voltages only about 15 volts below normal . . . Do not remove bottom plate from chassis. Instead, remove the small plate at back of chassis directly below the deck upon which is mounted the 80 and 45 tubes. Look for a charred 25,000 ohm resistor. Replace it and the associated 1 mike condenser, which has shorted, causing the resistor to burn out.

MAJESTIC 500. Poor selectivity . . . Drill hole in top of second i.f. transformer case and mount a balancing condenser in this position, connecting it across the transformer primary. Adjust for maximum selectivity.

PHILCO 30. Thin, metallic quality . . . If circuit, tubes and speaker seem to be in good condition trouble is probably characteristic "stiffness" of speaker cone. This may be remedied, if the customer will pay for it, by a little careful cone-cutting. Free edge by cutting out between points where screws are necessary for support. Cut slots in the apex member of the voice coil to give it greater flexibility. Spiral slots, starting at the center and winding out near the edge are suggested. Three are usually sufficient.

PHILCO 70. Set impossible to balance so that stations come in on proper dial settings . . . When all else fails remove gang condenser. It will usually be found that the front end of the shaft has dropped a fraction of an inch although this is not visible from the top. Replace with new gang unit.

PHILCO 80. Volume control does not cut down smoothly on strong locals and on some stations will not attenuate to zero . . . Change volume control circuit, using No. 3793B part. Original control had one terminal to ground, the other to the antenna post and the variable arm to the antenna coil. Using new part place one end to the antenna post and also to the antenna coil, the other to the i.f. grid return and the variable arm to ground. The i.f. grid return end goes to the 2nd detector, anchored on cased condenser lug to one side of chassis. Remove lead from condenser.

RCA 55. No reception except powerful locals, voltages, tubes ok . . . Check, preferably by substitution, .1 mike condenser connected between blue and black leads, located in capacitor pack mounted on separate power unit. Cut loose blue lead at resistor mounting board and substitute 600 volt tubular replacement from vacated terminal to ground. Trouble is generally high resistance leak of the order of 1/10 megohm, which upsets a.v.c. circuit. (IF 175 kc.)

STEINITE. Improving volume control in models using control across primary of r.f. coil, with tapped antenna coil . . . Leave tapping switch as is. Use 5,000 ohm tapered control to perform two functions at once, i.e.: reducing r.f. voltage across plate coil and at the same time introducing resistance in the plate circuit. This may be done by connecting the two fixed terminals of the control across the primary of the r.f. coil, carrying the variable arm to B plus and inserting a .1 mike, 300 volt by-pass condenser from B plus to ground. Or one fixed terminal of the control may be connected to plate, the variable arm of the control connected to the low end of the primary and the other fixed terminal to B plus, with a .1 mike condenser from B plus to ground.

the speech transmission medium. The room was recently used in the Nye munitions investigation.

The Alexandria High School, just over the river and now under construction, will have a centralized P.A. outfit by means of which both record and microphone broadcasts can be reproduced in each and every classroom. And the principal will need no stool pigeon to check up on activity in any room, if he is so inclined, as listening in requires only the flipping of a switch in the headman's office. The sound of a spitball ricocheting off a blackboard may well get its youthful sponsor into an immediate mess of trouble.

Hoover Flying Field uses a system to "blow the men down." It used to play music for field visitors but hotcha selections evidently took aviators' minds off their work. So they dropped the idea.

Here, There, Everywhere

St. Paul's, Sacred Heart and St. Aloysius churches make sure worshippers in the back seats hear, using P.A. Most local funeral parlors are similarly equipped, making

one organ do its stuff in any private room. Night clubs of the Willard, Mayflower, New Shoreham and Wardman Park hotels have P.A. Armstrong, Dunbar, Eastern, Western and Central high schools have installations.

A chain of drug stores uses P.A. in every store between lunch counters and diminutive kitchens. Maryland and George Washington Universities bolster up rah-rahs at every football game. Griffith ball park has a permanent installation. Local garages all over the city use P.A. to relay orders from the receiving department to all others. Union Station announces the arrival and departure of trains via mike and amplifier.

Then, of course, there are the occasional affairs renting equipment from one or another of the public address men about town. One operator claims to do a \$25,000-a-year rental business within 100 miles of the Nation's Capitol.

Just about every large radio dealer or distributor rents or sells public-address equipment and while not all of them have made it into a major business there are enough systems in constant use to make Washington the country's PUBLIC ADDRESS CITY #1.

In the Heart of "Competition Row" (Continued from page 22)

to have a little more confidence when they see that we actually have them than if they think we are unable to buy as cheaply as some of our good friends in the neighborhood. As a consequence we do a relatively small volume on these but they help our first line sales to beat the band."

HERE was the second answer to the puzzle presented by the success of this dealer. He actually tries to sell a full price tube to a customer who asks for a cheap one and succeeds in most cases. But still I was not satisfied.

"Don't you think you could increase your volume by pushing the cheap tubes instead of squelching them?"

"No doubt I could, but not my profit. Aside from the increased profit on the full priced brand, there is the question of replacements. These cheap tubes are not good and we know it. When complaints come in we have to make replacements at our own expense and still the customer is not satisfied. But what is even more important is the complaints which *don't* come in. There's nothing we can do about those. That's why we sell the cheap makes only with a definite understanding that we are not responsible.

"The matter of price guarantee is another very important thing. One good price reduction without protection on a large stock like ours could easily wipe out more than a year's profit.

"There is also the question of cooperation. We get everything from attractive packages to up-to-date displays from our main source of supply. They're always around with some new idea to make it easier to sell their tubes. Their advertising, log books and literature push our store as much as their own product. These, too, are uncounted items of profit."

This was the third and last answer to my riddle as to how it could be done. Mr. Rose hadn't said anything that every dealer doesn't know. They've heard it many times before. But too often it's forgotten when the lure

of the extra discount lets one's desires run away with good judgment. It's just as true of the consumer as the dealer. It's just as true of other industries as it is of the radio business. It's just as true of you and me as it is of those unfortunate people who daily are sold gold bricks in the shape of radio tubes.

But "cheap" is not the theme song of the Trans Atlantic Radio Stores. Their experience proves conclusively that if full prices and full profits are being secured even in Cortlandt Street, and if it can be done there, it can be done by anybody, anywhere.



Hatry & Young, of Hartford, Connecticut, has installed a public address system in the Franklin cafeteria. Now, when the waitresses sing out: "Ham an'," the chef hears them, and how!



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DEPENDABLE LONG LIFE

Ken-Rad Radio Tubes are made to give clear, dependable reception. They satisfy customers and build good will for dealers. Write for full information.

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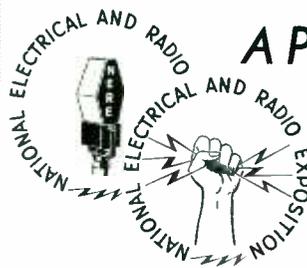
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An 11 Day Congress of Electrical Achievement

Where you can tell your story at Little Cost

Reserve Your Space NOW
You Cannot Afford to Miss It!

An Exhibit Space for Every Need

The flexible exhibit unit floor space plans permit you to have exactly the size space you need to properly present and demonstrate your product. Two Great Exhibition Floors—High ceilings—No Basement space.

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Show Manager
National Electrical and Radio Exposition
480 Lexington Ave., New York
Wickersham 2-0300

National ELECTRICAL and RADIO EXPOSITION

GRAND · CENTRAL · PALACE ·

Lexington Avenue, between 46th and 47th Streets, New York City

"Where The Great National Shows are Held"

COMPLETE ELECTRIC PLANTS

ONAN ALTERNATING CURRENT ELECTRIC PLANTS furnish the same current as supplied by power lines—110 volt, 60 cycle, A.C.

OPERATES A.C. RADIO, PUBLIC ADDRESS AND SOUND CAR EQUIPMENT



For all Household and Commercial Purposes. Runs Washing Machine, Water Pump, Refrigerator, A.C. Motors.

SIZES 350 TO 50,000 WATTS

Operate on Gasoline, Gas or Distillate. No battery used except to start engine. Ideal for places remote from electric service. Battery Plants also available in similar sizes.

High-grade, inexpensive ONAN PLANTS offer opportunity for sales of Plants, Radios, Wiring and Appliances. Write for details.

D. W. ONAN & SONS

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22% Greater Signal Strength Efficiency!

WITH THE
WARD Magic Super Auto Antenna

Approved for all Turret Top Cars and many others.

The ordinary type of under-car antenna gives only 60% Signal Strength Efficiency.

The WARD Magic Super Antenna gives 82% Signal Strength Efficiency!

To further insure Perfect Auto Reception use WARD No-Loss SUPPRESSORS



DEALERS! JOBBERS! SERVICEMEN!
Write for Illustrated Catalog!

WARD PRODUCTS CORP. 2135 SUPERIOR AVE. CLEVELAND, OHIO U.S.A.

Macy Directional Baffle



Ideal for all P. A. requirements, indoor and out, controlled sound distribution eliminates feed back difficulties, improves the fidelity and increases "speaker efficiency"; constructed of reinforced spun aluminum; 100% weatherproof; size, bell 17 in., length 20 in. up to 12 in. in diameter.

Available for all cone sizes
Net Price \$8.82
List Price \$15.00

Model MB-10

Macy Engineering Co., 1449-39th Street, Brooklyn, N. Y.

Write for new catalogue covering complete line of baffles, trumpets and dynamic reproducers.
Desirable Territory Available for Representatives

• • • a PLUS VALUE of increasing importance

Are you interested in reaching an export market which bought 612,000 radio receivers in 1934? A market which has shown a steady increase for the past 5 years?

That's the foreign market you can economically reach through *Radio Retailing*—a plus value of important buying power, represented by the following paid foreign circulation.

U. S. Possessions.....	51
Central America, Cuba, Mexico and West Indies	57
South America	108
Europe	304
Asia	96
Africa	31
Australia, New Zealand and Cyprus	123
Canada	193
Total	963

P.S. *Radio Retailing's* total monthly circulation, both U. S. and foreign, is 20,230.

RADIO RETAILING

330 West 42nd Street
New York, N. Y.

SEARCHLIGHT SECTION

EMPLOYMENT and BUSINESS OPPORTUNITIES—SURPLUS STOCKS—DISCONTINUED MODELS

UNDISPLAYED—RATE PER WORD:
Positions Wanted (full or part-time salaried employment only), 10 cents a word, minimum \$2.00 an insertion, payable in advance. (See ¶ on Box Numbers.)
Positions Vacant and all other classifications, 15 cents a word, minimum charge \$3.00.
Proposals, 40 cents a line an insertion.

INFORMATION:
 Box numbers in care of our New York, Chicago and San Francisco offices count 10 words additional in undisplayed ads. Replies forwarded without extra charge.
 Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:
 1 inch \$8.00
 2 to 3 inches 7.80 per inch
 4 to 7 inches 7.60 per inch
 Rates for larger spaces, or yearly rates, on request.
 An advertising inch is measured vertically on one column, 3 columns—30 inches—to a page. Radio Retailing

SPECIAL NOTICE:

TO THE RADIO INDUSTRY

Advertising in connection with legitimate offers of surplus stocks and discontinued models of radio merchandise is acceptable in this section of "Radio Retailing."

Extreme care will be exercised by the publishers to prevent the use of advertising in the Searchlight Section to encourage price cutting on current models of merchandise or equipment. Nor will advertising which invites violation of the dealer's contract with the manufacturer be acceptable.

All merchandise offered in the Searchlight Section must be accurately and fully described and must be available on order.

"MILES AHEAD OF OTHERS"

Miles Reproducer Co., Inc., 112-14 West 14th St., N. Y. Since 1923, Makers of P. A. Equipment.

Closing Out 1935 Models Amplifiers-Units-Trumpets-Mikes-Sound Systems to Make Room for New High Fidelity P. A. Lines.

Microphone Repairs —

- Large Size \$4.50
- Medium \$3.50
- Small \$2.50

Immediate Delivery

If you have a special Sound problem write to our Mr. J. M. KUHLIK, Sales Mgr.

Miles Reproducer Co., Inc.
 112 West 14th St. New York

GENUINE GREBE PARTS

In Stock for all Grebe Sets built prior to 1933. Use only Genuine Grebe Parts in servicing these sets to maintain the original high standard of performance for which they were noted.

Write for Parts Price List

C. I. VERMILYE
 (Former General Factory Manager of A. H. Grebe & Co., Inc.)
 137-30 Jamaica Ave. Jamaica, N. Y.

MICROPHONE REPAIRS

Any make or model completely rebuilt—Missing parts replaced. Replated if desired. Guaranteed equal or better than new. Large size: \$6.50. Medium: \$5.00. Small: \$3.00. Single button: \$1.50.

Send for Microphone Catalogue.

ELECTRO-VOICE MFG. CO., Inc.
 330 E. Colfax Avenue, South Bend, Ind.

"Opportunity" Advertising:

Think
"SEARCHLIGHT"
 First

LEGAL NOTICE

PUBLISHER'S STATEMENT OF CIRCULATION

This is to certify that the average circulation per issue of Radio Retailing for the six months' period July 1st to and including December 31st, 1934, was 20,205.

(Signed) H. W. MATEER, Manager.

Subscribed to and sworn before me on this 21st day of February, 1935.

(Notary's Seal) LILLIAN E. BOWEN, Notary Public.

Bronx County Certificate 187, Certificate filed in New York County 1120. Registers office 6-B-685. (My Commission expires March 30, 1936.)

KEEN EMPLOYERS RECOGNIZE WELL TRAINED SERVICE MEN

Many employers insist upon their service men having a background of modern radio servicing methods such as possessed by graduates of America's Oldest Radio School.

RCA INSTITUTES, Inc.
 75 Varick St., New York
 1154 Merchandise Mart, Chicago

Address Dept. RR for Illustrated Catalog

Jobbers and Dealers

Send for complete information and territory protection regarding

FULTON AMPLIFIERS

Complete line of Equalized Power Amplifiers for every purpose.

FULTON RADIO CORP.

100 Sixth Avenue
 New York, N. Y.

Just out—the new 1935 Spring and Summer ALLIED Catalog. Devoted 100% to Radio. A real Double-Value Book listing the highest quality Standard Radio Lines at less than so-called "bargain" prices. Features thousands of exact duplicate replacement parts for all makes of receivers—all leading lines of test instruments, tools, etc. Offers new profit-making ideas in Sound Equipment, Phonograph Modernization, All-Wave Antenna Installations, etc. Service Engineers and Dealers—It's wise to consult this new ALLIED Catalog before you buy. It will bring you bigger profits and help you give better service. Send for this valuable FREE Catalog now. Address Dept. SE.

ALLIED RADIO CORPORATION
 833 W. JACKSON BLVD., CHICAGO, ILL.



NOW—how to repair and rewind all types of motors...

ELECTRIC MOTOR REPAIR LIBRARY

4 volumes, \$10.00, payable in easy monthly installments

THIS set of books should be on the shelf of every man who ever has to touch a motor for purposes of repairing it or changing it to meet different operating conditions. In shop language and with practical shop methods it covers every step in stripping, rewinding and connecting a.c. and d.c. motors of all kinds.

How to change motors for different operating conditions

Here is all the information you need in order to determine what changes various types of motors permit; to lay out new windings for specified service conditions; and to handle every step in the work with satisfactory results.

Covers all types of motors, from those used in small household and commercial appliances of all kinds, to mining and railway motors. Explains principles underlying the different types of windings; gives definite instructions for doing the various rewinding jobs. Also gives many data, tables and diagrams constantly needed by the repair man, including data difficult to get from any other sources.

Low price—easy terms—10 days' examination on approval

Bought separately the books in this Library would cost you \$11. By using this coupon you need pay only \$2.00 in 10 days and \$2.00 monthly until the special price of \$10.00 is paid. In addition, we give you 10 days in which to examine the books. Send no money; simply fill in and mail the coupon now; let us know your answer after you have seen the books.

McGraw-Hill Book Co., Inc.
 330 W. 42nd St., N. Y. C.

Send Electric Motor Repair Library for 10 days' examination on approval. In 10 days I will send \$2.00, plus few cents postage, and \$2.00 monthly for four months, or return books postpaid. (We pay postage on orders accompanied by remittance of first installment.)

Name
 Address
 City and State.....
 Position
 Company SRR-5-35

**"IT'S MY STORE...
AND I'M PROUD OF IT"**



*That's the way you feel about your business
and that's the way Sylvania feels, too . . .*

● When a man owns his own store, you can bet he's proud of it. It's his business. His bread and butter depend on how well he does his job . . . on the customers he gets and holds.

That's the way it is with Sylvania. If you met the men who run Sylvania, you'd meet the men who own it. We're proud of our business . . . of Sylvania's reputation among dealers and distributors.

That's why every tube that goes out of the Sylvania factory is the finest that science and workmanship can make it. That's why Sylvania tubes are now sold by more dealers than ever before.

Find out about Sylvania's sales policies. Write today for information about the extra profits you can make by selling Sylvania's. The Hygrade Sylvania Corporation, Emporium, Pennsylvania.

SYLVANIA
THE SET-TESTED RADIO TUBE

© 1935, H. S. C.

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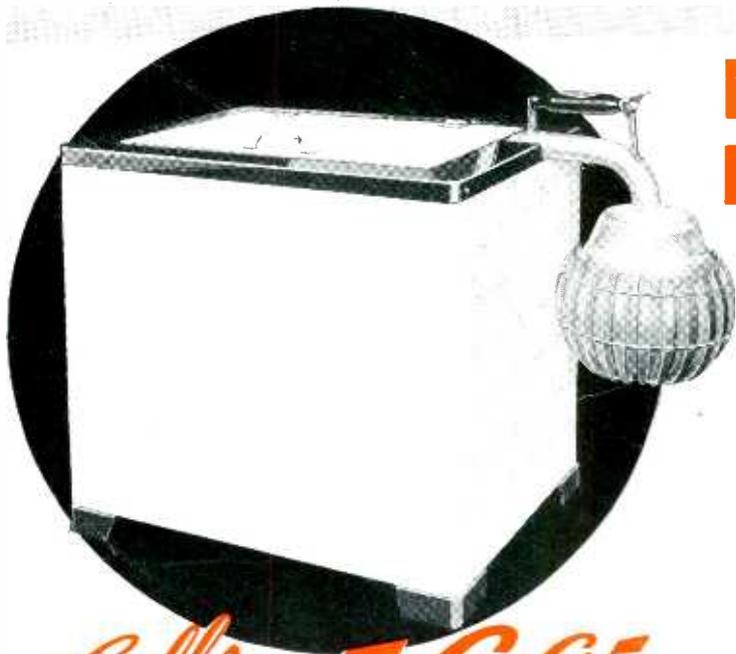
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MILLIONS OF UNWIRED HOMES NEED FOOD-SAVING REFRIGERATION TOO

For them...
THE NEW **CROSLLEY ICYBALL**
REFRIGERATOR



ENORMOUS MARKET INCLUDES:

*Rural Homes • Dairies •
Summer Camps • Road-
side Stands • Boats*

ANY PLACE WITH- OUT ELECTRICITY...

Most everybody can afford it . . .
It saves more than it costs

*Sells
for only* **59.95**
F. O. B.
FACTORY

Price includes cabinet, stove,
Icyball unit, Stabilizer and tub

Plenty food space in the Crosley Icyball. Also adapts for bottles (wet or dry refrigeration).

Icyball freezing unit and stabilizer.

ICE FROM HEAT

This for one to 1½ hours daily — and the Icyball gives refrigeration an entire day for only 2 cents.

Quality all the way through. Trouble-free operation. Complete silence. Unbelievable economy. Gross capacity 43 cu. ft. NET capacity 3.5 cu. ft. Freezing tray makes 14 ice cubes. Gleaming white laquer exterior, black-trimmed. Thoroughly insulated. Rubber gasket under lid. Outside dimensions: 28-1/16" high (including hardware), 41 1/2" wide (including ball), 24 1/2" deep. Inside dimensions: 19-13/16" high, 23 1/4" wide, 17" deep.

Beyond reach of electric power lines . . . but within your reach, this enormous market for the new Crosley Icyball. A dependable, practical, amazingly economical (uses 2c worth of kerosene daily), refrigerator. As great a food-saver as any refrigerator made.

What a boon to rural homes, dairies (equipped with drain for wet refrigeration), roadside stands, boats. And the price means quick sales in any language. No wonder we repeat—an enormous market awaits the Icyball. One in which there is no effective competition. A responsive, willing, dependable market . . . as wide as the country beyond your city limits.

As Crosley has given dealers local leadership with the Crosley line of radio receivers and the celebrated Shelvador Electric Refrigerator, so Crosley now gives you leadership in another field with a product that stands alone—in design as well as value. You cannot afford not to handle Crosley.

THE CROSLLEY RADIO CORPORATION - - CINCINNATI
(Pioneer Manufacturers of Radio Receiving Sets)

POWEL CROSLLEY, Jr., President

Home of WLW—the world's most powerful broadcasting station

S R OBRECHT
513 PEISALOZZI ST
TELL CITY IND

11



AUTO SETS ADVERTISING PROMOTION

MEAN PROFITS FOR YOU!

MOTOR NOISE SILENCED

Extremely thorough shielding, new design and antenna band pass filter result in the practical elimination of all ignition noises. Spark plug suppressors unnecessary to most cars.

REDUCED BACKGROUND GROUND NOISE

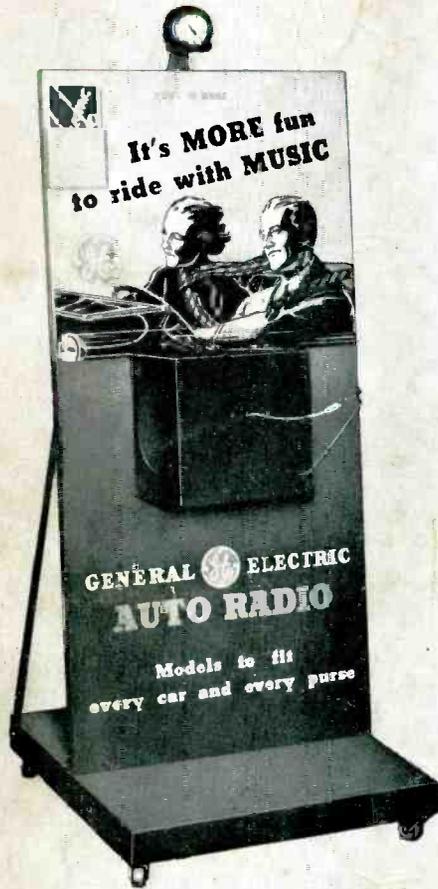
Internal noise is greatly reduced, giving vastly improved signal — set noise ratio, and providing greatly improved reception of distant stations and weak signals.

IMPROVED TONE

New circuit design, new tubes, an improved audio system, a dynamic speaker of extraordinary sensitivity and great output afford tone of exceptional fidelity and balance throughout the audible range.

STREAMLINED REMOTE CONTROL

The beautiful appearance of the remote control unit — even the knobs being streamlined — harmonizes with the interiors of the most luxurious cars. It can be mounted conveniently on the steering column, or, with special adapter, on the instrument board.



MODEL D-50 5-tube single unit superheterodyne auto radio. Every tube a working tube. Low battery drain. Excellent performance. Fine tone. Price.....\$44.95

When you sell the new General Electric Auto Radio, you operate under a service plan that protects your profits — and leaves you free to devote your facilities entirely to sales or service as you prefer. The mighty combination of outstanding sets, powerful national advertising, effective selling aids and the G-E Approved Installation Station Plan — assures you of secure and generous profits.

THE LINE

Illustrated are two of General Electric's unsurpassed auto radio sets. There are five sets in all — giving the dealer a line broad enough to meet every prospect's needs, and giving the purchaser a choice of models in a wide range of prices.

NATIONAL ADVERTISING

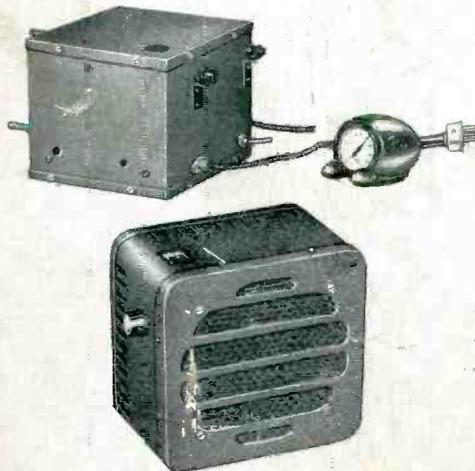
National advertising in the Saturday Evening Post will tell millions of car owners about General Electric Auto Radio. Your part of the job is to make sure that your community knows you sell G-E Auto Radio — and General Electric helps you do that.

PROMOTION MATERIALS

Promotion materials of the most unique and effective sort are at your command. Folders, mats, direct mail, store signs — everything you need to do a strong merchandising job. The display stand illustrated is one of the outstanding sales helps G-E makes available to its dealers.

The peak of the selling season for new cars and auto radio is here now. Learn without delay WHY selling General Electric Auto Radio is more profitable and easier business. Phone or write today to your General Electric Distributor — or write to Section R-115, Merchandise Dept., General Electric Co., Bridgeport, Conn., for full information.

Model D-72 7-tube DeLuxe two-unit superheterodyne auto radio. Improved dynamic speaker. Full range tone control. 4 watts output. DeLuxe performance. Price.....\$74.95
Prices slightly higher in the West, Midwest and South. Subject to change without notice.



GENERAL ELECTRIC AUTO RADIO