

RADIO RETAILING

INCLUDING
SERVICE
AND
INSTALLATION
SECTION

Home Entertainment Merchandising

**Once Again—
PROGRESS**



LIST
PRICE
\$1750

The Self-Rectifying
ELKONODE

*Mallory engineering
develops new principle*
**an Eliminator without
a Rectifying Tube**

LAST YEAR . . . Mallory Engineers made
auto-radio all-electric by eliminating "B" Batteries.

THIS YEAR . . . Mallory Engineers obsolete
the rectifying tube with a self-rectifying Elkonode.

As a complete Eliminator — this model will operate any automotive radio set now on the market and will function satisfactorily on any car. Proper installation is a simple matter — and a profitable sale. The market for the Mallory-Elkon "B" Eliminator includes all radio-equipped cars now using "B" Batteries; also all cars now in service whose owners will install radio during the present year.

Note These New Features

- 1. No Tube Required** — Eliminates the hazards and expense of a rectifying tube and starts much more quickly.
- 2. No Noise** — Silent in operation.
- 3. Simplified Construction** — Fewer parts.
- 4. More Output** — Adjustable to current requirements of any set.
- 5. Higher Efficiency** — 60% efficiency — the highest yet attained in any "B" Eliminator.
- 6. Less Battery Drain** — One-third less than tube rectifier eliminators.
- 7. Smaller** — More convenient to handle.
- 8. New Low List Price** — Placing all-electric auto-radio within the reach of everyone.

Write for Complete Information

P. R. MALLORY & CO., Inc.

MALLORY ELKON

"B" ELIMINATOR

With the Self-Rectifying Elkonode

INDIANAPOLIS, INDIANA

In 1929 Majestic startled the world with the first superheterodynes with dynamic speakers at new low prices . . . thousands of dealers made fortunes on sales that totaled 1,000,000 Radios in one year!

History Repeats

with an opportunity to cash-in on a perfect "natural"

THE NEW ALL-IN-ONE

Majestic AUTO RADIO



\$49⁵⁰

Installed Complete with Tubes and Suppressors (less antenna), and Federal Tax Paid

Price Slightly Higher on West Coast

Here is an opportunity to cash-in on a waiting market of more than *twenty-million* car owners—every one a prospect for the new Majestic Auto Radio! Priced within the reach of every car owner . . . so revolutionary in design . . . so outstanding in performance . . . so quickly and easily installed it will outsell any other type of auto radio on the market.

**Here are the features of the amazing New Majestic Auto-Radio
They spell quick, easy sales and added profit for you**

Engineered on an entirely new principle—a departure from all that has gone before—this new Auto-Radio incorporates developments found in no other type of auto radio. It is an *all-in-one* unit, the speaker, chassis and the exclusive Duro-Mute "B" eliminator are contained in a metal case which is mounted on the fire wall.

The installation of the new Majestic Auto-Radio is so easily effected that *no radio experience is required*. Four small holes are drilled in the fire wall, two for each bracket on which the receiver is suspended, the receiver is bolted to these brackets, the remote

control unit is attached to the steering column, the battery cable connected to the car battery and the antenna to the receiver, and the radio is ready for operation. Due to the simplicity of installation, very few tools are needed and it can be installed in less than 30 minutes.

Receiver is a six-tube superheterodyne with eight-tube performance, and uses Majestic's exclusive Spray-Shield tubes. A highly efficient automatic volume control does away with blasting and fading. This receiver, with its dynamic speaker, not only gives faithful reproduction over a wide range without distortion, but is also simple to tune and free from all complicated and installation troubles, and does not mutilate the car in any manner.

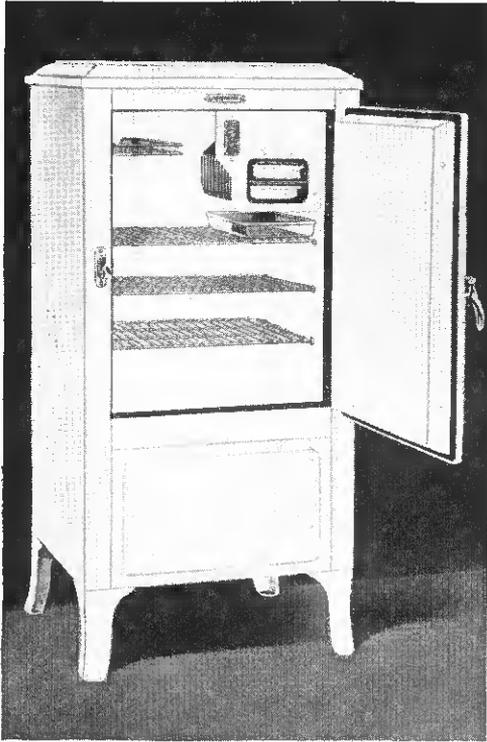
*Thousands of alert dealers will cash-in on this "natural" . . . WHY NOT YOU?
Write or wire us, or your nearest Majestic Distributor, for complete details!*

GRIGSBY-GRUNOW COMPANY, CHICAGO, and affiliates, with factories at Chicago; Toronto; Bridgeport; Oakland; London, England; and Sao Paulo, Brazil
Manufacturers also of MAJESTIC REFRIGERATORS



WORLD'S LARGEST MANUFACTURERS OF COMPLETE RADIO RECEIVERS

A spectacular value in Majestic Refrigerators



To put every Majestic Refrigerator dealer in utmost favorable position to meet demands for low-priced merchandise, Majestic announces this

NEW LIST PRICE

Model 450 (Century Line) with shelf area of 10.7 square feet. Exterior dimensions: Height, 52 $\frac{1}{16}$ inches; width, 24 $\frac{9}{16}$ in.; depth, 21 $\frac{3}{8}$ in.; depth overall, 23 $\frac{3}{4}$ inches; net capacity 4.8 cubic feet. **\$99⁵⁰**

List price, at factory, tax paid

Prominent display of this model in your window, with price featured, will attract prospects inside your store where a convincing presentation can be made of Majestic

~~ELECTRO~~ SEALED REFRIGERATION

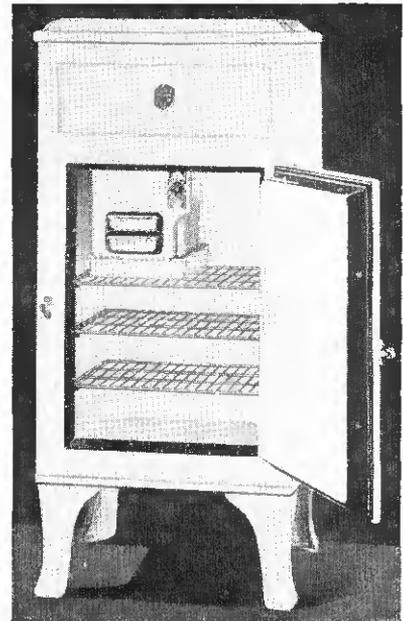
In the new Majestic models the refrigerating unit is safely sealed beneath a metal dome—not merely “hermetically sealed” but **ELECTRO-SEALED for life**, against moisture, dirt, and abuse.

Interior food compartment is *isolated* from exterior kitchen heat by Majestic’s Isolator-Wall Construction with its triple-type insulation, and asphalt-sealed joints.

Here is *proved* refrigeration! Here is a refrigerator that will *give* service and not *require* service. Here are a score and more of important features every housewife wants in her refrigerator—and a delivered price that will unquestionably tempt her to buy.

If you are not already stocked with Majestic’s new line, write or wire your distributor today. And don’t forget that Majestic’s new low prices put you right out in front with incomparable values.

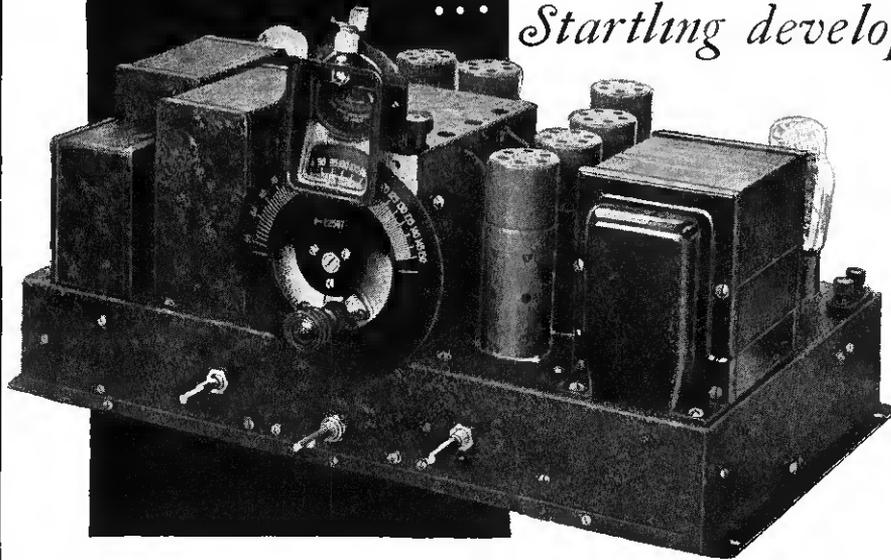
GRIGSBY-GRUNOW COMPANY, CHICAGO,
and affiliates, with factories at Chicago; Toronto;
Bridgeport; Oakland; London, England; and Sao Paulo, Brazil
Manufacturers also of MAJESTIC RADIOS



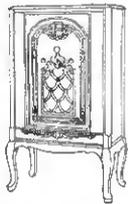
De Luxe Model 500 (Electro-Sealed)
—Food storage area, 9.68 sq. ft. Exterior dimensions: Height, 54 $\frac{1}{2}$ in.; width, 24 $\frac{1}{2}$ in.; depth, 20 $\frac{1}{2}$ in.; depth overall, 25 $\frac{1}{16}$ in. Two ice trays—42 ice cubes—4 pounds of ice per freezing. “Isolator wall” cabinet construction. “Stay-Kold” defroster. Chromium plated hardware. Cabinet finish: Exterior, Elastol; interior, Acid-resisting Porcelain, with rounded corners.

Majestic
~~ELECTRO~~ SEALED
REFRIGERATION

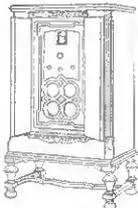
Advance Release



... Startling development announced by
Stromberg-Carlson
laboratories brings
new sparkle and
life to RADIO!



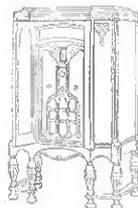
No. 48
Radio



No. 49
Radio



No. 50
Radio



No. 51
Radio and
Automatic
Phonograph

RADIO WITH an illusion of "presence" greater than ever known before. Radio beyond what even Stromberg-Carlson engineers hoped for a year ago.

New audio tubes (just announced), a new circuit and a new speaker combine to give new realism to reproduction. Double push-pull audio amplification using two of the new Super-Triodes No.2A3 results in *six times* more power than with any previous Stromberg-Carlson. There is a new vacuum rectifier, No. 5Z3 (not the troublesome Mercury Arc) of unprecedented reserve for sudden surges of distortion-free power when needed.

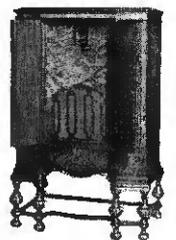
All in all, by taking advantage of present day economies we have been able to create even greater values in these receivers, and the Stromberg-Carlson merchandising plan will make every dealer happy.

Prices of Stromberg-Carlsons range from
\$143 to \$567.50. (East of Rockies).

STROMBERG-CARLSON TELEPHONE
MANUFACTURING COMPANY
ROCHESTER, N. Y.

"There is nothing finer than
a Stromberg-Carlson"

In addition, Stromberg-Carlson presents a NEW radio, No. 43. This is a strikingly beautiful model. Handsome burl Walnut with its exquisite grain lends beauty to the finely proportioned cabinet. Six legs give an effect of graceful stability. Equipped with the popular No. 38 type chassis.



1894

Stromberg-Carlson

MAKERS OF VOICE TRANSMISSION AND VOICE RECEPTION APPARATUS FOR MORE THAN THIRTY-FIVE YEARS



1933



STURDY

WHEN you buy merchandise of a manufacturer you automatically begin a partnership that does not end until the goods have been sold. Naturally, then, you want to know what kind of a man you're taking into your business! And here is how the Hygrade Sylvania Corporation measures up:

You want a partner who is financially sound; Hygrade Sylvania has a credit rating of AAA1 — the highest granted.

You want a partner who is loyal; Hygrade Sylvania is owned by the men who manage it. Its only goal is greater success for their company and its customers.

You want a partner with expe-

rience; Hygrade Sylvania is an old-timer in the electrical field.

You want a partner who will work with you; Hygrade Sylvania gives you a quality product — consistent national advertising — whole-hearted selling help.

Last — you want a partner who is *strong* — who brings support, not weakness to your business. Hygrade Sylvania has increased its dealer and financial strength during 1930, '31 and '32. When you sell Sylvania Tubes you share a part of this strength and this success. You take in a partner who helps build your profits! Hygrade Sylvania Corporation, Sylvania Division, Emporium, Penna.



Sylvania
(Reg. U. S. Pat. Off.)

THE SET-TESTED RADIO TUBE

The NEW 1933 Grebe here by



Doctor Wu

FIVE TUBE SUPERHET . . .
3 GANG CONDENSER, a.c.—d.c.
listing at

\$27⁵⁰
Complete
with
RCA
tubes

*Grebe's matchless tone and startling discounts
assure NEW PROFITS for Grebe Dealers*

Yes the 1933 "Synchronette" is here—ready for alert dealers to cash in on "GREBE"—a name that has always stood for tone quality unrivaled in naturalness—a name in which upwards of five million dollars in advertising has been invested in winning and holding public acceptance. The public demanded this NEW GREBE "Synchronette" and here it is.

Console quality in a nutshell

The new "Synchronette" is small only in size. Tell your customers to close their eyes when it's performing and defy them to tell the difference in tone or quality from that of the largest console on your floor. Let them put it through every test for selectivity, sensitivity, quietness of operation—they'll get the thrill of a lifetime. For the "Synchronette" defies comparison regardless of its size.

Styled to sell

Everything about the "Synchronette" is designed to meet public taste. Its appeal is individually personal. It makes any customer say "That's just the set I've been waiting for—how much does it cost?"

The **GREBE**
Synchrophase
RADIO

Priced for quick profitable turnover

At \$27.50 List, the "Synchronette" not only moves fast but with GREBE'S new series of startling discounts, merchandising profits are offered which assure GREBE dealers just the sort of "break" they've been hoping might sometime come their way. Now GREBE offers it in its new sales plan.

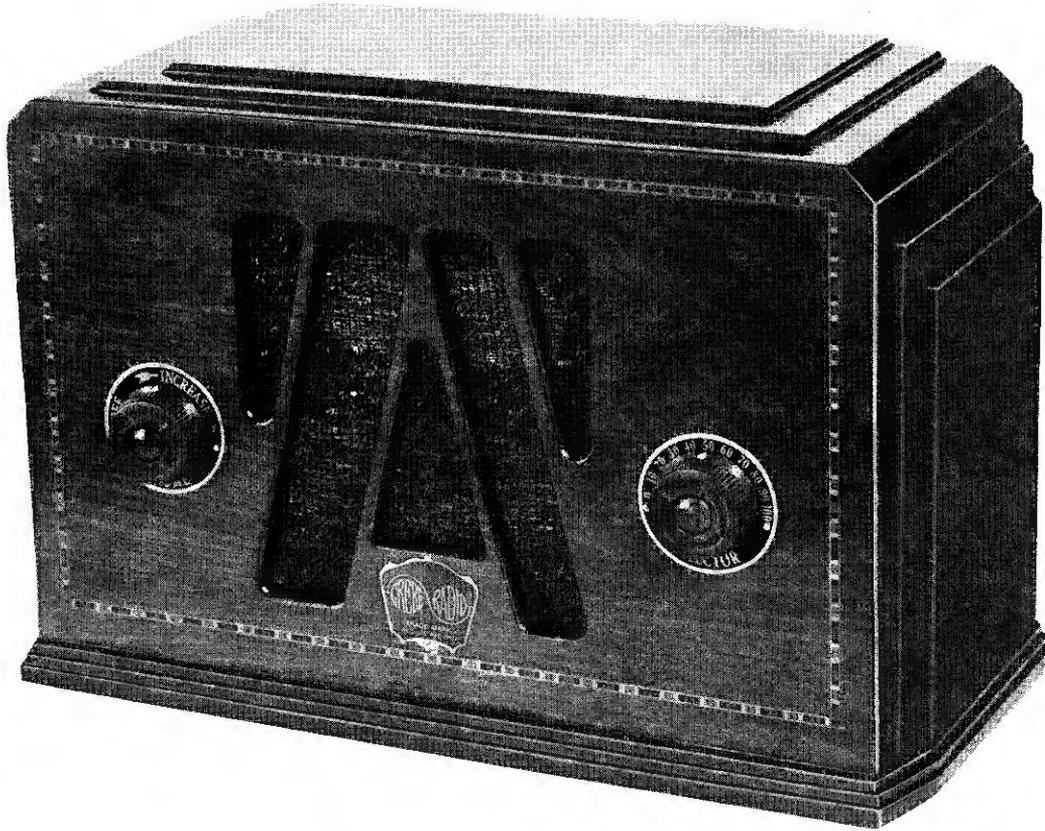
SYNCHRONETTE *public demand!*

DIRECT from GREBE to YOU—Mr. Dealer

That's the new GREBE sales policy. And that's why GREBE is able to give the dealer *all the discounts* which hitherto have been split up among wholesalers and jobbers. You, Mr. Dealer, can add middle men's profits to your own! Isn't that just the "break" you've been waiting for? If it is, you'll want to get further details about the Grebe Sales Plan. Fill in the coupon below and mail it today.

MATCH THESE
"SYNCHRONETTE"
SPECIFICATIONS!

Superheterodyne; 3-gang condenser; 5 latest type tubes, consisting of 2-77's, 1-78, 1-25Z5, and 1-43; full dynamic speaker; operates on 25-60 cycle a.c. or d.c. current; encased in genuine walnut cabinet with Marquetry inlays; 10 $\frac{3}{4}$ " long, 5" wide, 7 $\frac{1}{4}$ " high.



A. H. GREBE & CO., *Metropolitan Sales Division*
117 Liberty Street, New York, N. Y.

A. H. GREBE & COMPANY, 117 Liberty Street, New York

Gentlemen:

Please send further details about the Grebe Sales plan and the entire Grebe line.

Name

Company

Address



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

★ ★ ★ ★ DEWALD

A Complete AC-DC

The Famous

★
MODEL 551
DE LUXE

An exquisitely lovely walnut cabinet of new and exclusive design. The last word among the little fellows. Creates new standards of appearance, selectivity and sensitivity. A giant among the midgets, it will break sales records in 1933.

\$30.00

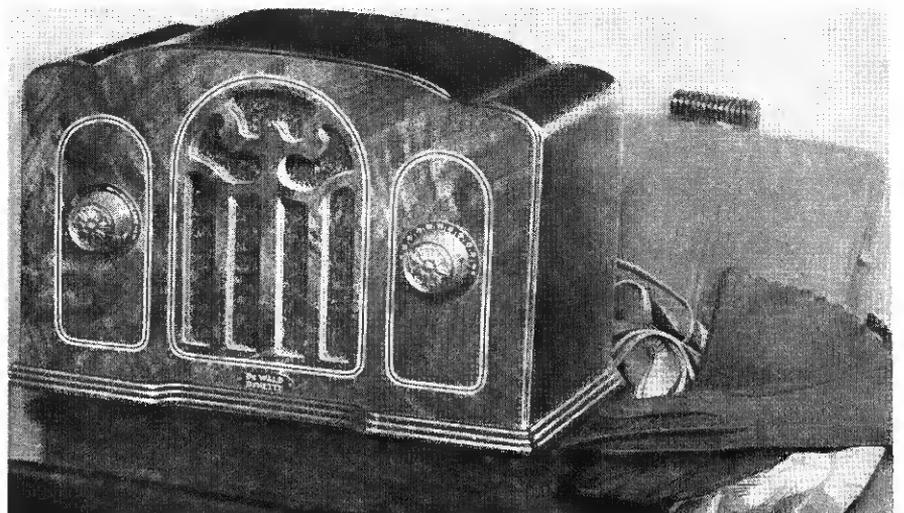


These are the two new DeWald compacts — Superheterodynes, both of them, with improved Dynamic Speaker and hairline tuning to within 10 kilocycles. The new tubes (25-Z5, 77, 78, 44 and 43) are standard equipment. 110-220 Volts, 25-60 Cycles, AC-DC. Weight 7½ pounds. Chassis heatless. Built in aerial range covers Police as well as Broadcast wavelengths.

★
MODEL 550

Identical in chassis design with Model 551 (shown above) it has the same distinctive performance characteristics. Piano finish, duotone walnut cabinet with inlay.

\$25.00



▼
▼
▼
JOBBER

There still are a few territories open for DeWald representation certain to be profitable. Write, wire, or phone for the DeWald Facts.

PIERCE-AIRO INC.

520 Sixth Avenue

New York

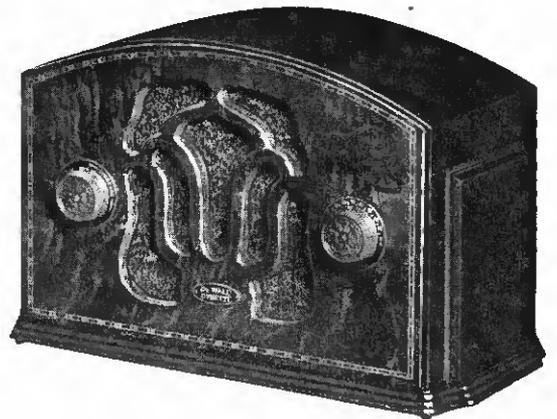
Announces... Line for 1933

DeWald Dynette

Every DeWald dealer is making money this year — showing profits when competitors are barely struggling along. DeWald's Dynette did that. A hit from the start — it stayed that way — a leader.

From now on, the DeWald franchise will be even more profitable — for here at last is a *complete* line of AC-DC receivers.

Look them over — their specifications — their prices. Each is distinctive — each is featureful. Turnover merchandise — made to order for the critical buyers that make up this year's market.



★
MODEL 54A

Five tubes, Dynamic Speaker, excellent power and tone—to which are added performance on 6, 32, 110, 220 volts AC-DC, either 25 or 60 cycles. Functions on Farm Lighting Circuits, Automobiles, Yachts—in short on any type of current. (Carrying case available.)

\$25.00



★

MODEL 60-3

Improved high-gain, super sensitive receiver. Push-pull power amplification. Six tubes (two No. 37, two No. 43, one No. 37, one 25-25). Duo output. Low power consumption. Variable tone control and shadow-graph selector. The large size chassis is heatless. Large, new type Dynamic speaker. 110-220 Volts—AC-DC—25-60 cycles. Dimensions, height 17½" — width 13½" — depth 8¼".

\$35.50



★
MODEL 60-42

Universal receiver, same as Model 60, except for console cabinet—a deLuxe housing for this remarkably efficient set. Height 42" — width 24" — depth 13". Quotations on request.

Literature? Details?

JUST WRITE YOUR NAME AND ADDRESS ON THE MARGIN OF THIS AD

For Eleven Years Makers of Distinctive Radio Receivers



Philadelphia Electric and Radio Show

COLLECTIVE ACTION FOR MARCH

To gain greater public acceptance for electric refrigeration—to cultivate a new crop of buyers is the common aim of the electric refrigeration industry.

The purpose can be accomplished in only one way—COOPERATION. By welding individual efforts into a great mutual one, sales outlets can accomplish together what they cannot accomplish independently.

There are many means of cooperating but none more effective and timely for March than a Cooperative Electric Refrigeration Exhibit.

An activity of this nature, involving the cooperation of radio and all other local sales outlets for electric refrigerators, may be readily adapted to any

town, large or small, and may be fitted to even the most limited funds.

It may be strictly an electric refrigeration show. It may be a leading feature of an all-electrical show, of a food show or of a better business show. It may be a part of a Child Welfare Week or it may be confined to an exhibit in the lobby of the principal motion picture theatre.

At nominal cost, the Bureau offers promotional materials to aid in advertising and conducting a cooperative exhibit. These consist of illustrated chart lectures, truck banners, tire covers, window display signs, newspaper mats, envelope stuffers, etc.

Write today for further information concerning cooperative shows and promotional materials.

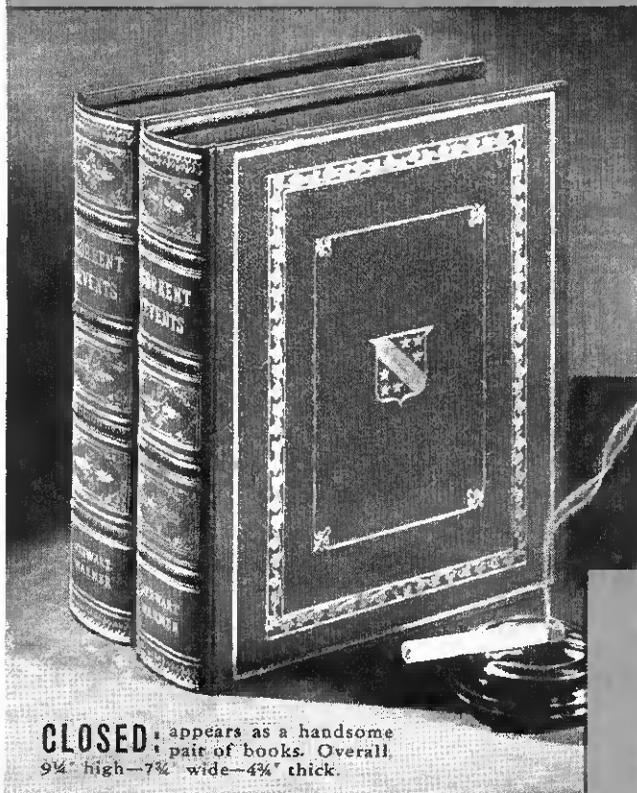


ELECTRIC REFRIGERATION BUREAU

420 LEXINGTON AVE., NEW YORK CITY

PROVING THE RADIO SALES "HIT OF THE YEAR"

New Companion-Sets by STEWART-WARNER



CLOSED: appears as a handsome pair of books. Overall 9 1/2" high—7 1/2" wide—4 1/2" thick.

In 7 Handsome Bindings

Illustrated above is one of the popular Standard Editions offered in handsome red, green, or brown bindings, with attractive gold stamping. Furnished complete with tubes, 20-ft. indoor aerial on concealed reel, and a 6-ft. "Heat Take-Off" plug-in cord, only **\$26⁵⁰**

Special and De Luxe Editions in genuine leather with 22 K. gold stamping, slightly higher.

Also—3 Smart ALL-METAL MIDGETS

The Smallest Fine Radios on the Market

In these new Companion-Set midgets, Stewart-Warner demonstrates the big advantage of metal cabinets for small radios. Here's a set that combines smart, handsome design—compact size, and outstanding performance. All features of the Book Model have been retained, making the All-Metal Companion-Set the greatest value ever offered in a midget.

The All-Metal Companion Sets, with black modernistic decorations, are offered in Japanese Statuary Bronze, Satin Silver or Dull Gold. Complete with tubes, 20-ft. aerial on concealed reel, and 6-ft. "Heat Take-Off" plug-in cord, only **\$24⁵⁰**

HEAR these smart, new, novel Companion-Sets and you will know why dealers all over the country are finding them the sensational sales-makers of the year. 10 models in the line! 7 Book Models and 3 smart All-Metal Midgets. Each one is a high grade personal radio—outstanding in looks and performance—priced to protect your profits and yet attract the public.

BOOKS — that TALK — that SING — that PLAY

Looks just like a pair of handsome books, richly bound with attractive gold design. But when it is opened—presto!—there is a high grade radio. Has a highest quality reproducer that costs twice as much as those thought good enough for ordinary midgets. Everyone is a prospect for one of these Companion-Sets as a personal radio—or as a second set for the home. Get into the profits now.



OPEN: A tiny radio that brings in the finest programs on the air. Also Police Calls.

FOR USE ON ALL CURRENTS
110-volt A. C.— 60 or 25 Cycle
110-volt Direct Current
Also furnished with special adaptors for use on:
6 or 12-volt Batteries
32-volt Direct Current
220-volt A. C. or D. C. Current



Overall height only 7 in., width 7 1/2 in., depth 3 1/2 in.

GET FULL DETAILS FROM YOUR NEAREST DISTRIBUTOR OR SEND COUPON TODAY

STEWART-WARNER CORPORATION
1826 Diversey Parkway, Chicago, U. S. A.

R. R. 3-33

Please send me broadside illustrating all Companion-Set models in full colors, and give me the name of your nearest distributor.

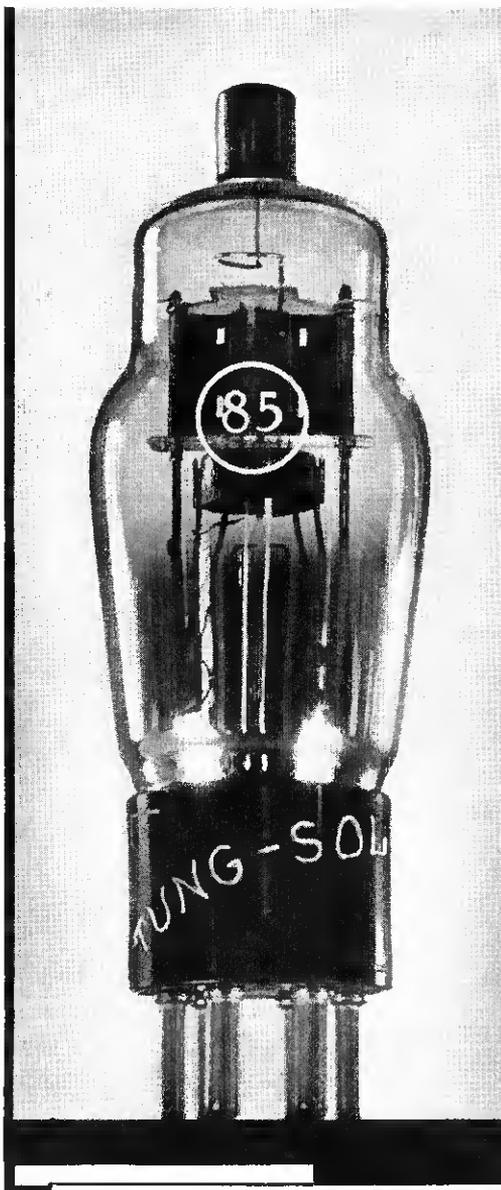
NAME

ADDRESS

CITY STATE

ONE ADVANTAGE OF SELLING

TUNG-SOL RADIO TUBES



is the fact that you can count on a **FULL PROFIT** on every tube you sell Ruinous, cut-price competition is impossible under the Tung-Sol selling plan. . . . This plan also has other unique advantages Why not find out **ALL** about them, now?

TUNG-SOL RADIO TUBES Inc.
NEWARK, N. J.

Atlanta
Boston
Chicago
Dallas
Kansas City
New York
Charlotte
Cleveland
Detroit

Los Angeles
St. Paul



AGAIN.. *Emerson* LEADS THE WAY!

with this Complete Distinctive Line of AC-DC "Compacts"

"The Handful Radio that Works Anywhere"



8¾ in. wide
10½ in. high
5 in. deep
•
Weights only
9 pounds.

6-Tube SUPERHETERODYNE with DYNAMIC Speaker and 3-GANG Condenser

Emerson Model 35 operates from any lamp socket on either AC or DC current—110 volts—25 to 60 cycles. It is housed in a cabinet of the finest craftsmanship. This set is typical of the sales-appeal all the new Emerson models possess.

\$32⁵⁰

COMPLETE with Cunningham tubes and built-in aerial.

Most unusual radio cabinet, of Sheraton design. Solid walnut construction, with finest burl walnut veneers, hand rubbed finish. Circuit uses the following latest-type tubes: 2-78, 1-77, 1-85, 1-43, 1-2525. Exceptional tone quality—Automatic Volume Control.

DEALERS—Jobbers handling Emerson Radio are now located in every large center. If you don't know your nearest jobber, write or wire us for his name and full particulars on the Emerson 1933 line.

All Emerson Sets are also adaptable for use on 220 volts.

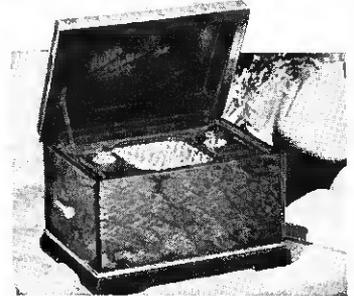
EMERSON RADIO AND PHONOGRAPH CORPORATION
641 Sixth Avenue :: NEW YORK, N. Y.

5-Tube Superheterodynes with Dynamic Speakers

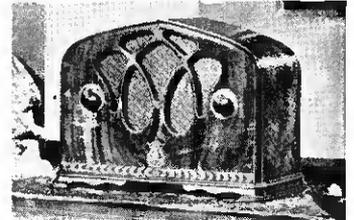
(Operate on both AC and DC—110 volts—25 to 60 cycles.)



MODEL 30—A smart Portable that's "at home" anywhere. Complete with tubes and aerial..... **\$30**

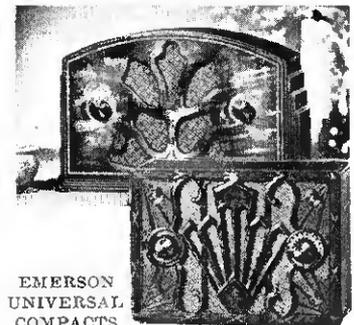


MODEL 300—Superb Radio Chest in Sequoia burl veneers. Complete with tubes and aerial..... **\$30**



MODEL 250—Handsome design in modified Gothic. Burl walnut. Complete with tubes and aerial... **\$25**

Operate on ANY Current ANYWHERE
—6 volt and 32 volt as well as 110 and 220—AC and DC—any cycle



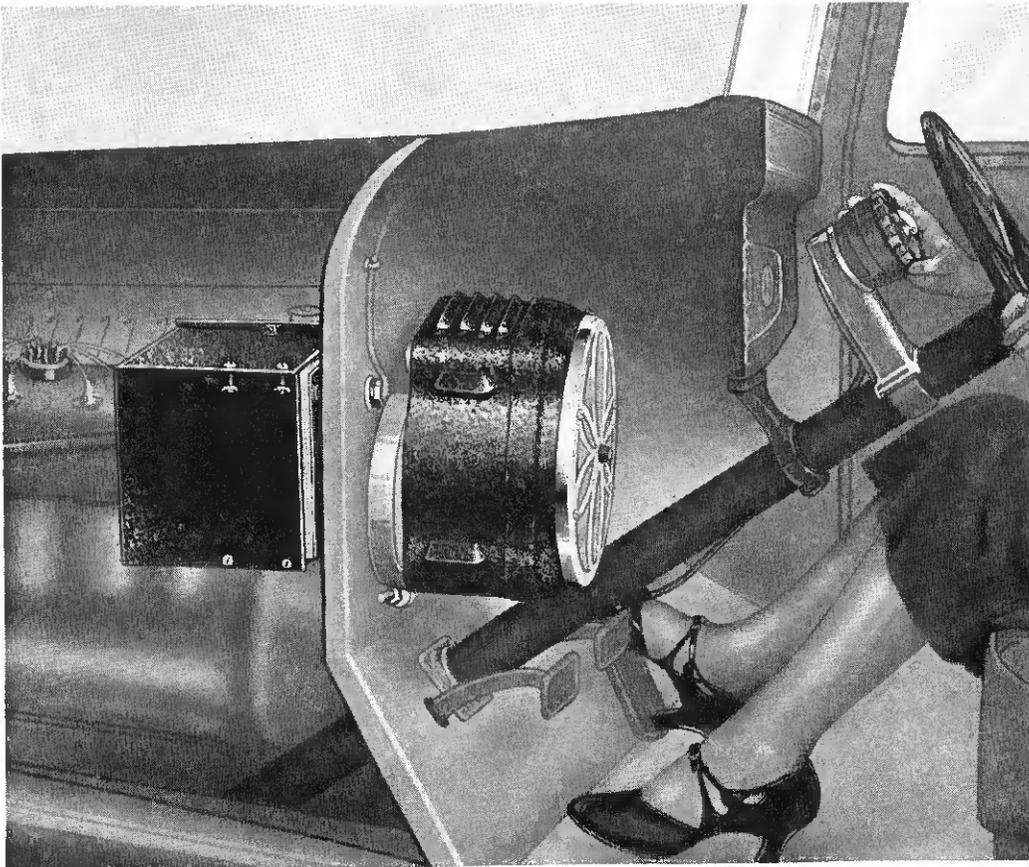
EMERSON UNIVERSAL COMPACTS

MODEL 25A—the radio that set a new style. Complete with tubes and aerial..... **\$25**

MODEL 20A — finest grade bakelite cabinet. Amazing value. Complete with tubes and aerial... **\$17⁹⁵**



Sensational New ARVIN CAR RADIO



*All-Electric
Superheterodyne
With Marvelous
Performance*

*Many Features
that Simplify
Installation
and Operation
In Any Car*

Here is a new Arvin sales opportunity for you—a radio that is really designed and built for motor cars. It has Arvin personality in appearance and performance. It looks much like the well-known Arvin Hot Water Car Heater. And it is almost as easy to install.

One small and compact unit mounts on each side of the dash, out of the way, as shown above. Only three holes to drill. Convenient, remote control clamps on steering column at any angle desired. And the performance sets a new standard in a car radio.

Coming at a time when extra profits are quite desirable—and the public desire for a real car radio is growing stronger—this announcement will be good news for the thousands of automotive dealers who know from experience that the name Arvin on a product means quick and sure profits.

This will also be interesting to countless radio dealers who have never sold Arvin products, but have heard that Arvin always does a merchandising job that makes sales come fast. Mail coupon below for full information.

*2 Models
at Popular
Prices with
Attractive
Profit for you*

NOBLITT-SPARKS INDUSTRIES, Inc., Columbus, Ind.

Send us prices and full information on the Arvin Car Radio.

FIRM NAME.....

ADDRESS.....

Check whether you are retailer () or wholesaler ().

*Mail this
Coupon
for Full
Information*

RADIO RETAILING

HOME ENTERTAINMENT MERCHANDISING

O. H. CALDWELL, *Editor*

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T. H. PURINTON, *Assistant Editor*

M. E. HERRING, *Publishing Director*
HARRY PHILLIPS, *Art Director*
P. WOOTON, *Washington*

NEW POLICIES

Called For—Statistics Reveal

UNIT sales showed less decline last year, from those of the year before, than was anticipated. Sets off but 23.5 per cent; tubes within 9,000,000 of the 1931 figure—and parts actually higher by approximately 25 per cent.

But the dollar's volume picture, the real index of prosperity, was not so favorable—total billings, at retail, being \$196,190,000 as against \$309,270,000 for '31, a drop of 36.6 per cent. The retail business in sets (all types, less tubes) was \$124,860,000 for 1932 and \$212,040,000 for 1931. Making allowances for the depression, it is all too apparent that we failed to make the most of our opportunities.

Never has radio constituted a more vital part of our national life, yet in the selling of sets the industry now finds itself at profitless cross-purposes. It has become its own worst enemy. Meanwhile, from the consumer angle, radio continues to be a highly desirable commodity, be the price high or low.

CLEARLY our ways of doing business must be revamped. A new concept of stabilizing policies is needed. To accomplish this many different forces now running unleashed, must be brought under control. Constructive action must come from all along the line, particularly from the distributors and dealers who have much to gain. But stabilization in manufacturing is the first essential. That is why we hail the recent settlement of the Government's radio suit as a starting point for stabilization in the set field. In turn many other steps must also be taken. These are outlined in *Radio Retailing's* platform in this issue.

Most of the ingredients out of which a better radio business can be built are at hand. Brighter days in radio will come when every factor in the business seeks out and uses the constructive forces that are waiting to be put to work.



TUBE SALES HOLD UP—Tube sales, in units, for '32 show less decline than any other radio commodity. This was due to our growing replacement market. But dollars volume drop off was more marked, showing the need for holding lists at present levels. See, also, special article in this issue, "The Tube Situation."

EXPORT SALES—In addition to tubes sold for domestic consumption, above graph, we exported in 1932, 3,758,905 units, with a declared value of \$2,012,656.

2,620,000 SETS

Sales trends emphasize action if industry is

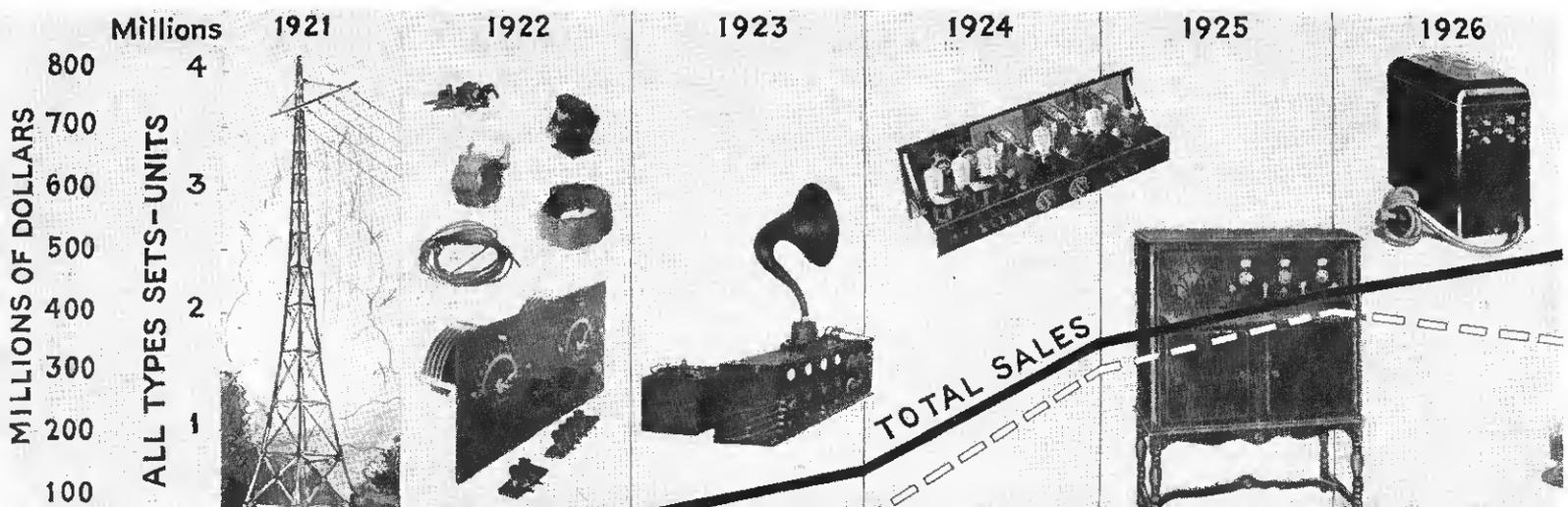
NO ANALYSIS of present merchandising trends as revealed by a study of sales statistics, would be complete without mention of the rapidly growing influence of the "sub-midget" on dollar volume and on the sale of consoles. Since November, 1932, these small table models have taken the country by storm, until today they are sold at the rate of 200,000 per month.

Under present economic conditions this tide of popularity cannot be stemmed—even if such action were desirable. The public wants \$25 radio and practically every set manufacturer in the country is responding to this demand. We must accept the inevitable and make the most of it.

Total Sales of Radio

	1929
RADIO SETS, ALL TYPES INCLUDING AUTO-RADIOS AND COMBINATIONS	4,438,000 \$592,068,000
TUBES	69,000,000 \$172,500,000
A-B-C (DRY) BATTERIES	\$30,530,000
ACCESSORIES*	\$39,950,000
PARTS SOLD TO CONSUMER	\$7,500,000 (estimated)
TOTALS	
SETS, ALL TYPES	\$592,068,000
TUBES, ACCESSORIES, BATTERIES	\$242,980,000
PARTS	\$7,500,000
GRAND TOTALS FOR YEAR	\$842,548,000

* Includes speakers, aerial equipment, meters, pick-ups, turntables, furniture, power units, storage batteries, chargers, etc.



Sold in 1932

*need for cooperative
to be stabilized*

Stabilization, in the face of this condition, can be promoted in three ways: By exerting every effort to see that the prospect first has a larger and better performing set in his home, if he can afford it; Second, by selling the type 1933 midget at its full list price; Third, by presenting it as a supplementary set for the many secondary uses for which it is so eminently fitted.

AUTO-RADIO receivers played their first major rôle during 1932 to the tune of 143,000 radio outfits installed in motor cars. For further details see special article on this important stabilizing influence—which starts on page 24 of this issue.

Products at Retail

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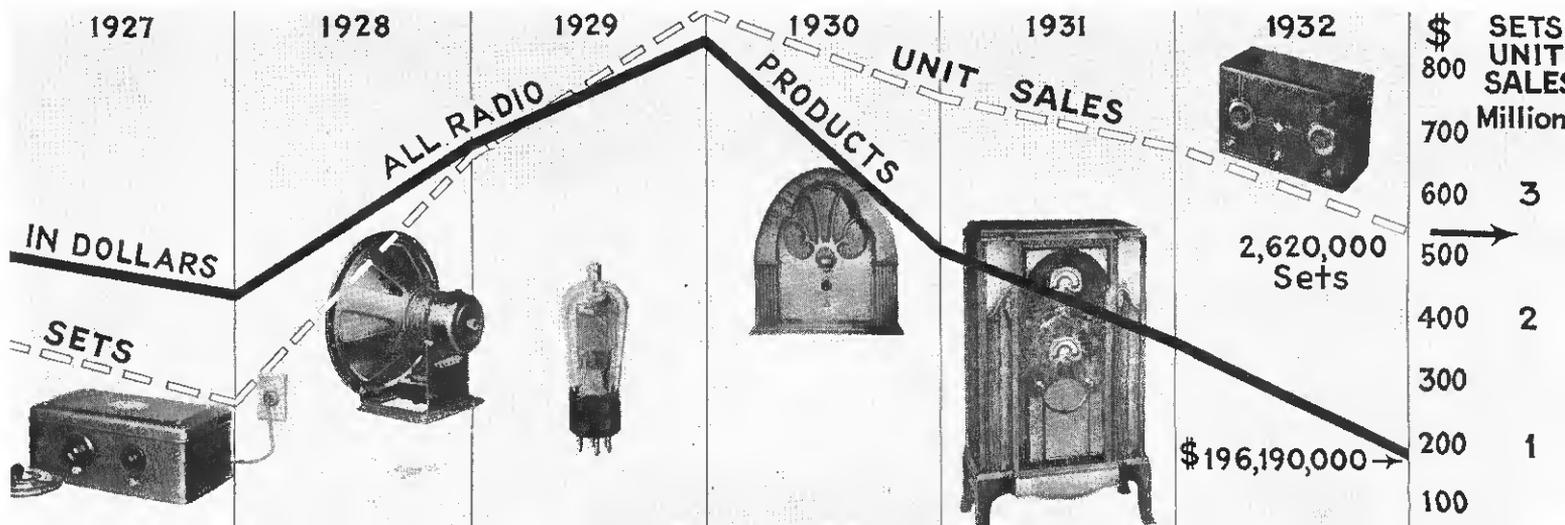
1930	1931	1932
3,827,800 \$332,198,000	3,420,000 \$212,040,000	2,620,000 \$124,860,000†
52,000,000 \$119,600,000	53,500,000 \$69,550,000	44,300,000 \$48,730,000
\$21,514,000	\$13,100,000	\$9,500,000
\$17,120,000	\$8,580,000	\$6,200,000
\$6,000,000 (estimated)	\$6,000,000 (estimated)	\$6,900,000 (estimated)
\$336,717,500 \$158,234,000 \$6,000,000	\$212,040,000 \$91,230,000 \$6,000,000	\$124,860,000 \$64,430,000 \$6,900,000
\$500,951,500	\$309,270,000	\$196,190,000

Permission to quote statistics is granted if credit is given "Radio Retailing"
† Does not include tubes, at an estimated retail value of \$16,280,000



SETS PRICED LESS TUBES—Because of the advisability of separately listing all tube sales, it should be borne in mind that *Radio Retailing's* statistics of the retail value of sets sold do NOT include tubes.

EXPORT SALES—According to Government figures 289,926 radio receivers were shipped abroad last year, with a declared value of \$7,221,426. In 1931, the peak year, 471,659 sets were exported—declared value, \$14,357,029.



NEEDED

AT THIS critical time, when the difference between cooperation and individualism may mean the difference between having a sustaining industry or a drifting one, it is necessary that thought again be given to the need for establishing certain policies if the radio business is to prosper. The following suggestions point the way to stabilization

A PLATFORM

To Insure A Living Profit For All

Of major importance is the establishment of a manufacturer-jobber-dealer merchandising relationship with one common purpose in mind—a living profit for all and that on a long time basis.

There are many elements involved in such an objective. Here are the more important ones:

Simplify Lines

Fewer models and less frequent model and price change announcements. Quality items for the discriminating and smaller sets for those of limited means.

Price Stability

Once a price is announced let all concerned hold to that price. The enforcement of this policy is of utmost importance.

Territorial Protection

Whenever possible grant territorial protection—and make every effort to keep out of the market current merchandise offered at less than suggested lists.

Dealers—"Sell Up"

The situation calls for salesmanship—of the highest order. Only by selling up can the "average-sales" figure be made worthwhile.

Manufacturers and Jobbers— Develop and Support Worthwhile Dealers

Fewer and better dealers must be our slogan. The time for indiscriminate distribution is past. Ten trained and loyal retailers should sell more sets than 100 uncontrolled miscellaneous outlets.

Stress Tone and Quality

A radio receiver should be sold as a musical instrument. Manufacturers should provide such merchandise in their lines. And dealers must sell tonal beauty above

all else, using the same arguments as apply to a piano or violin.

Sell Second and Third Sets to the Home

The saturation bugaboo will vanish before a sales campaign which recognizes the need for a set in practically every room in the house. Here's where the midget can be featured constructively.

"In the Home" Selling

Dealers *think* they are contacting every prospect—but surveys show that *hundreds of thousands of prospects never have been "asked to buy."* Systematic coverage is the answer. By telephone and door bell pushing reach *every* home in your community, at least once a year.

Sell Tubes

Yes, there's profit in tubes. The tube business is finding itself. Manufacturers are now willing to "play ball." For further details see special article on pages 26-27.

Financing Console Sales

The console still must be made the backbone of radio. Because most floor sets are now purchased on the time payment plan and because such paper is, at present, unacceptable by many discount houses, the set makers must arrange for such a service. Another opportunity for developing worthy dealers.

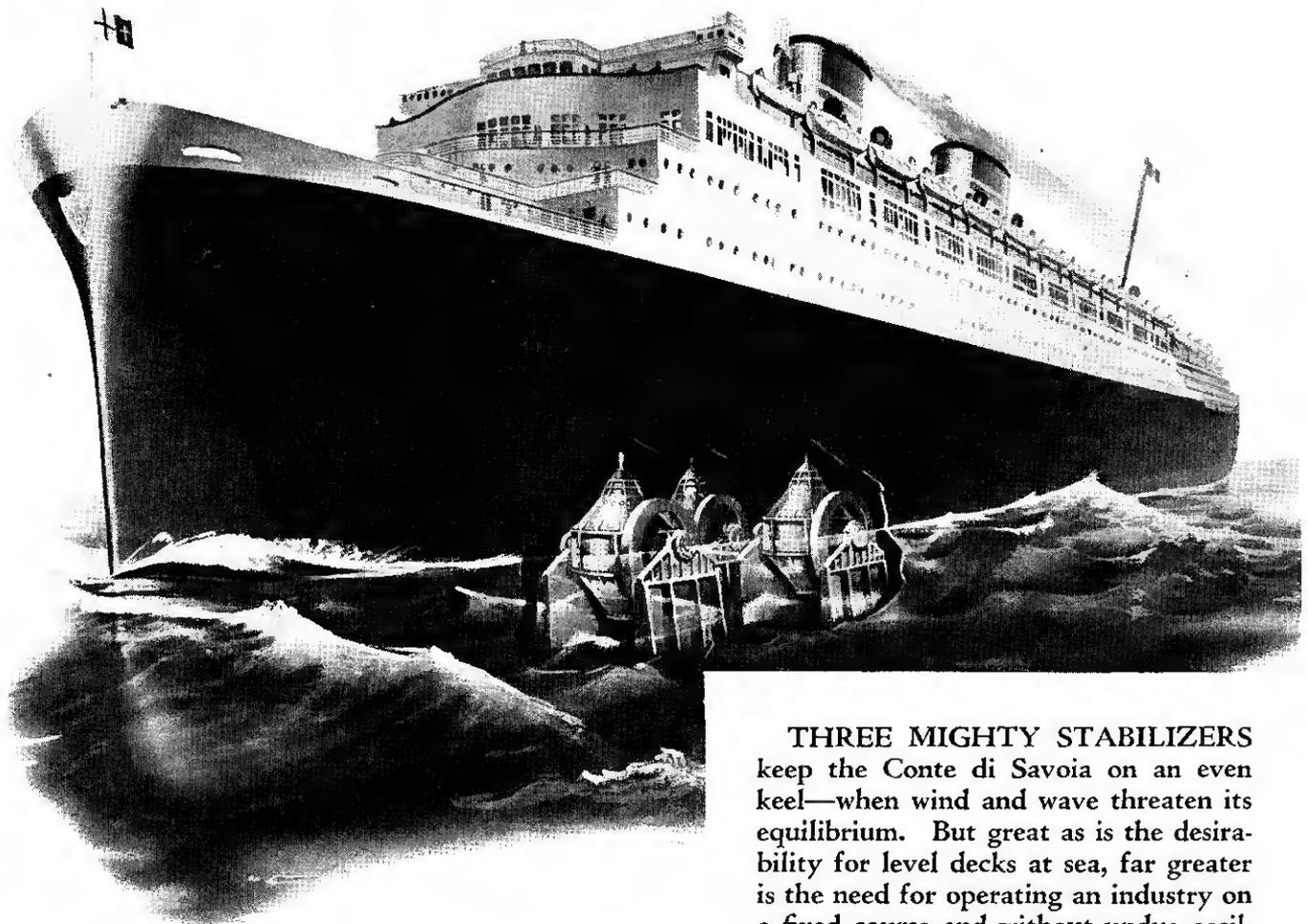
Add Style Appeal

"Styling" is a need of the hour. Set manufacturers would do well to give greater consideration to this important stimulant to consumer demand.

Allied Lines

It has been demonstrated that the radio dealer can and must broaden his activities. Electric refrigeration, other

Stabilization



THREE MIGHTY STABILIZERS keep the Conte di Savoia on an even keel—when wind and wave threaten its equilibrium. But great as is the desirability for level decks at sea, far greater is the need for operating an industry on a fixed course and without undue oscillations. For lack of stability in business will inevitably bring disaster.

major electrical appliances and table electrical devices should be thoroughly investigated. Push one or more of these commodities.

Automobile Radio

This coming opportunity has been fully presented in current issues of *Radio Retailing*. Get aboard, NOW, if you would fully live up to your opportunities as a radio dealer.

Parts, Public Address

These two activities are closely allied to radio proper. Many dealers are making money with them. Review again their possibilities in your territory.

Servicing—A Coming Stabilizer

The service business is assuming major proportions. But competence and the use of quality parts are essential to success. Such a combination will solve many a dealer's present problems.

RCA's Responsibility

With licensing control now placed so squarely in the lap of the Radio Corporation of America, an oppor-

tunity to help the industry as a whole is presented as never before . . . See feature article which follows.

Statistics

Mutual exchange of output and sales flow statistics will help stabilize production. An industry clearing house for this purpose should again be set up.

A New Opportunity for the RMA to be of Service

In its September, 1932, issue, *Radio Retailing* listed and explained 13 ways in which the reorganized Radio Manufacturers Association could be of greater service to the industry it represents. In conclusion we suggested that it appoint a "National Board of Strategy" whose purpose would be to promote greater public interest in quality reception and to improve the character of broadcast entertainment. These recommendations are too lengthy for repetition at this time.

Recent suggestions emanating from a high source have helped to crystallize and lend support to a plan, long

contemplated, which provides for better broadcasts and for radio manufacturer, jobber and dealer active participation in a national publicity campaign to stimulate public interest in programs.

We conclude this summation of stabilization objectives by outlining the procedure contemplated. *Radio Retailing* wants your comment, Mr. Dealer and Mr. Manufacturer. Here is the plan:

A PLAN

For Selling Qualified Sets For Promoting Better Broadcasts For Stimulating Interest in Radio

Step No. 1

Make the RMA Seal Mean More

The Radio Manufacturers Association has recently launched a meritorious idea. Sets made by reputable concerns may carry a small metal disc, permanently affixed and bearing the official RMA Seal of Certification. The intent, of course, is to promote the sale of quality products.

But to be fully effective two things need to be done: (a) Limit the use of this RMA seal *strictly* to sets passing rigid tests for quality requirements. Such examinations of product to be conducted by an unbiased board of engineers or by a reliable testing laboratory. (b) Launch a widespread campaign of national advertising tied in with dealer local publicity, so that such an earmark of approval will have real significance with Mr. and Mrs. Set Buyer.

But—to take these two very necessary steps will require adequate financing. More of this in a moment. Let's first consider quality reception's twin sister, quality programs or . . .

Step No. 2

Better Programs This Summer and Fall

Times being what they are, present indications are that many of our most popular winter programs will be off

the air during the summer months. Regardless of such a possibility the fact remains—and many times has been commented on—that the radio industry itself should sponsor and promote unusual air features. Spot reporting of live news—while it is happening—for example. And what a wonderful opportunity to announce, during these headliner events, the RMA Seal of Certification and why the set “you buy” should be so approved.

But broadcasting costs money—even though, *Radio Retailing* has reason to believe, much chain station time would be donated. This situation, therefore, leads to

Step No. 3

Create a Fund for Promotional Purposes

At least 2,000,000 “approved” sets should be sold during 1933. A special fee of one dollar, or less, added to the selling price of each set and applied to staging radio industry feature programs, to promoting the “seal of quality” idea and to broadcasting the wisdom of buying approved sets, would be the biggest thing we yet have done to stabilize radio.

Part of this fund would go to provide dealer window trims, tying in with coming RMA headliner programs and featuring, also, the RMA seal. Set, parts and tube concerns also would devote part of their copy to these tangible things, of direct public interest.

Step No. 4

The Necessary Executive Machinery

This job is too big to be handled by the part time attention of any one man or by a voluntary committee. Office headquarters would have to be established, in charge of a competent organizer, an experienced promoter.

Given such a set-up, and with the trade concurring, the plan is feasible. Already a number of substantial interests have signified their willingness to participate. Comment is desired. What do you think about it, Mr. Dealer, and Mr. Manufacturer? What methods would you suggest for raising a fund for general promotional purposes and how should it be applied?

CANADIAN RADIO STATISTICS

1932 Radio Fees \$1,400,000. 105,000 Sets Sold

The Canadian Government has the radio trade of the Dominion “on the spot” through the decision of the Federal authorities to make the dealers and manufacturers responsible for the collection of the annual license fee of \$2 per set. The dealers claim that the license onus is discriminatory.

By way of explanation the Minister of Marine has announced that the Department needs the money for the new Canadian Radio Commission which intends to establish national broadcasting. The Government already has the accumulated license proceeds for the past two years for this purpose. The total collected in 1931, when the fee was \$1, was \$600,000. In 1932 the fee was doubled to \$2 and the revenue in hand is close to \$1,400,000 for 1932 collections alone.

According to an analysis of the radio trade situation in Canada, the average sell-

ing price of sets is now 42 per cent lower than the retail average of one year ago. Over a stated period, actual sales of new models were 11 per cent less than in the corresponding period of 1931 but the total value of all sets sold showed a decrease of close to 50 per cent. The average price of a receiving set at the factory dropped 35 per cent, to \$51.

According to “Radio Trade-Builder” there are now 1,058,866 sets in use in Canada. One hundred and five thousand were sold in 1932, compared to 286,000 in 1931. It is estimated that our northern neighbor sold, at retail, 2,750,000 tubes.

Retail prices of radio tube have shown a definite downward trend. Price reductions have taken place since the threat of prosecution of radio tube manufacturers by the Ontario Provincial Government on the charge of operating as a combine in restraint of trade.

Eveready-Raytheon Realign

LAST MINUTE NEWS—Effective March 31, the Raytheon Production Corporation, Newton, Mass., will resume responsibility for the sale and distribution of Eveready Raytheon tubes which function, for the past four years, has been handled by the National Carbon Company, of New York City. The sales force of National, however, will continue to sell “4-pillar” tubes to its jobbers and dealers after that date.

RCA Buys DeForest Assets

AS WE GO TO PRESS—The Radio Corporation has bid \$400,000 in cash for the assets of the DeForest Radio Company, now in receivership. This bid has been accepted, subject to the approval of the Federal Court. Another bid, from Hygrade Pennsylvania, also is before the Court.

DeForest's statement of March 31, 1932, put total assets at \$5,034,441. It has a controlling interest in Jenkins Television Corporation.

16,800,000 American Homes Own Radio Sets

STATES LISTED ALPHABETICALLY	% OF RADIO OWNERSHIP AS OF CENSUS APRIL 1930	NUMBER OF RADIO HOMES AS OF CENSUS APRIL 1930	NEW HOMES EQUIPPED WITH RADIOS SINCE CENSUS	% INCREASE IN NUMBER OF RADIO HOMES SINCE CENSUS	NUMBER OF RADIO HOMES AS OF JANUARY 1933	% OF RADIO OWNERSHIP AS OF JANUARY 1933
ALABAMA	9.5%	56,235	45,900	81.6%	102,135	17.3%
ARIZONA	18.1%	19,167	13,100	68.3%	32,267	30.4%
ARKANSAS	9.1%	40,096	35,300	88.0%	75,396	17.2%
CALIFORNIA	52.0%	836,705	231,000	27.6%	1,067,705	66.3%
COLORADO	37.8%	100,959	55,700	55.2%	156,659	58.6%
CONNECTICUT	54.7%	212,779	71,400	33.6%	284,179	73.1%
DELAWARE	45.9%	27,114	16,300	60.1%	43,414	73.5%
D. OF C.	53.9%	67,640	43,700	65.1%	111,340	88.7%
FLORIDA	15.4%	58,128	79,900	137.5%	138,028	36.7%
GEORGIA	9.9%	64,543	66,400	102.9%	130,943	20.1%
IDAHO	30.3%	32,772	13,100	40.0%	45,872	42.5%
ILLINOIS	55.6%	1,072,995	287,000	26.7%	1,359,995	70.5%
INDIANA	41.6%	351,090	127,000	36.2%	478,090	56.7%
IOWA	48.5%	308,448	63,000	20.4%	371,448	58.4%
KANSAS	38.9%	189,398	54,200	28.6%	243,598	50.0%
KENTUCKY	18.3%	111,217	58,300	52.4%	169,517	27.8%
LOUISIANA	11.2%	54,135	77,700	143.5%	131,835	27.2%
MAINE	39.2%	77,618	33,700	43.4%	111,318	56.3%
MARYLAND	42.9%	165,149	73,000	44.2%	238,149	61.8%
MASS.	57.6%	588,552	201,000	34.2%	789,552	77.3%
MICHIGAN	50.6%	597,629	139,000	23.3%	736,629	62.4%
MINNESOTA	47.3%	286,886	77,700	27.1%	364,586	60.1%
MISSISSIPPI	5.4%	25,357	22,100	87.2%	47,457	18.7%
MISSOURI	37.4%	351,298	216,000	61.5%	567,298	60.4%
MONTANA	31.9%	43,442	18,100	41.7%	61,542	45.1%
NEBRASKA	47.9%	164,159	39,600	24.1%	203,759	59.4%
NEVADA	30.6%	7,795	4,300	55.2%	12,095	47.5%
N. HAMPSHIRE	44.4%	53,022	21,200	39.9%	74,222	62.2%
NEW JERSEY	63.4%	624,865	194,000	31.1%	818,865	83.1%
NEW MEXICO	11.5%	11,348	7,500	66.1%	18,848	19.1%
NEW YORK	57.9%	1,825,723	675,000	37.0%	2,500,723	79.4%
N. CAROLINA	11.2%	72,059	56,000	77.7%	128,059	19.9%
N. DAKOTA	40.9%	59,246	20,500	34.6%	79,746	55.0%
OHIO	47.7%	809,142	327,000	40.4%	1,136,142	66.9%
OKLAHOMA	21.6%	121,702	48,400	39.7%	170,102	30.2%
OREGON	43.5%	115,948	44,400	38.3%	160,348	60.2%
PENN.	48.1%	1,075,127	488,000	45.4%	1,563,127	69.9%
RHODE ISLAND	57.1%	94,480	41,300	43.7%	135,780	82.1%
S. CAROLINA	7.6%	27,889	26,800	96.1%	54,689	14.9%
S. DAKOTA	44.2%	71,245	16,500	23.2%	87,745	54.5%
TENNESSEE	14.3%	85,962	97,800	113.8%	183,762	30.6%
TEXAS	18.6%	256,804	178,000	69.3%	434,804	31.5%
UTAH	41.1%	47,632	24,100	50.6%	71,732	61.8%
VERMONT	44.6%	39,783	12,700	31.9%	52,483	58.8%
VIRGINIA	18.2%	96,307	87,000	90.3%	183,307	34.6%
WASHINGTON	42.3%	179,493	69,900	38.9%	249,393	58.8%
W. VIRGINIA	23.3%	87,042	67,200	77.2%	154,242	41.2%
WISCONSIN	51.0%	363,265	87,800	24.2%	451,065	63.4%
WYOMING	34.1%	19,372	6,200	32.0%	25,572	45.0%
TOTAL	40.3%	12,048,762	4,760,800	39.5%	16,809,562	56.2%

"Radio Retailing," the Columbia Broadcasting System, set manufacturers, distributors and dealers all over the nation cooperated in bringing up to January 1, 1933, the state-by-state United States Census figures of April, 1930, showing the number of homes with

radio sets. We are indebted to the Columbia System for the vast amount of work necessary to complete this valuable statistical survey. This table is copyrighted by the Columbia Broadcasting System, Inc. New York City.

RCA Settlement Sets

Consent decree puts corporation in strong position to control licenses, bring infringers to time, and stabilize radio industry conditions

THE settlement of the Government suit against the Radio Corporation of America, by the consent decree entered last December, left the Radio Corporation in a strong position for the conduct of its own affairs, and for assuming a rôle calculated to bring stabilization to the sorely tried radio industry through control of the license situation.

The settlement decree clearly defined the right of R.C.A. to grant or deny licenses to other manufacturers for the production of radio receivers, and to do this at its own discretion and on conditions which it may itself determine. The settlement cleared the skirts of the defendant corporation with respect to litigation that had been hanging at Washington, and gave R.C.A. a clean bill of health to proceed, freed of vulnerability to political attacks.

Also, the agreement settled debt accounts of some \$30,000,000, owing to the General Electric and Westinghouse companies, which had accumulated over three years, leaving the Radio Corporation with cash on hand amounting to some \$25,000,000, and with accounts payable totaling only a little over \$4,000,000. Furthermore, the decree excluded the General Electric and Westinghouse companies from participation in the manufacture of radio sets for two and a half years, leaving the R.C.A. freed from the competition of these other industrial giants until 1935.

Licenses Under Group Patents

Meanwhile sole licensing authority to administer and grant radio licenses under the "group" patents is awarded to RCA, and to it alone. While the American Telephone and Telegraph Company, the General Electric Company, and the Westinghouse Company may grant licenses under their own patents, in most cases such patents require other cross licensing to be effective or useful, and licenses under the "group" patents, totaling some 4,000 in number, are reserved to the RCA.

Obviously, RCA'S dictatorial powers with respect to who shall manufacture radio receivers and tubes are limited to those concerns whose receiver circuits or other product designs infringe the many letters patent controlled by the Radio Corporation. With such a powerful array of patents, however, few will be able to circumvent them.

The radio industry has long looked to RCA for leadership. Often it has been disappointed. But in the present extremity of radio, it is to be hoped that RCA

will seize its opportunity to stabilize both the set and tube businesses, through sounder licensing procedure.

In stabilizing the industry, RCA will be protecting its own investments. With \$140,000,000 in RCA-Victor, the parent company must do everything to stabilize conditions in the receiving set field, if dividends are to be realized from the manufacture and sale of sets at Camden.

Also stabilization will mean continuous revenue from licensees through royalties pouring into RCA. Recent cancellations of licenses for non-payment of royalties, show how carefully licensees must be selected in the future, if not in the past.

The need of the radio industry is for a higher price level. Individual licensees are helpless in this respect, as the law now stands. But action to adjust prices upward can well come from the central licensing authority, perhaps through some plan of offering licensees a lower royalty basis as a legal method of changing the licensing arrangement, but with the added feature of price control as the means of actually increasing royalty returns and making radio manufacture profitable for all.

Steps Toward Stabilization

With the stage all set in its favor, what then will RCA do toward the stabilization of radio receiver production and marketing through its control of the licensing situation?

Here is an opportunity for *constructive* action, a clear call to *protect* deserving set makers against the unfair trade practices of free-booters—to lend a constructive hand in a merchandising sense. If the Radio Corporation confines its efforts to the mere granting of licenses, doubt will be expressed as to whether it is living up to the obligations which such a powerful control of an industry morally imposes.

In these times no one corporation can hope to monopolize an industry—nor should it set such an objective. Only through the mutual prosperity of friendly competitors will the radio industry emerge from this depression on a sound and going basis.

It will be seen, therefore, that the situation calls for helpful participation in the merchandising affairs of its licensees, by mutual consent. Protection, rather than subordination, should be the rule.

First, it may be predicted that RCA, being now in a position to proceed against unlicensed radio-set manufacturers, will vigorously press such suits, bringing the infringers to court through legal action against the manufacturers themselves, their distributors and their retailers. Already, a number of such suits have been started and are under way.

One result of this action to eliminate unlicensed manufacturers should be to heal the industry's sore spot of inferior and below cost products. Irresponsible "opportunists" have too long been permitted to pull down price levels with inferior merchandise.

Second, it may be predicted that the number and quality of radio licensees will be rigorously controlled. A much more searching scrutiny will be exercised over applicants for licenses, and with political pressure and

Stage for Stabilization

political bugaboos at Washington removed, the dictates of ordinary good business judgment can be followed to a greater extent than was possible prior to the settlement decree.

Limit the Number of Licensees

At the present writing there are about fifty receiving-set licensees—far too many to divide economically a radio set production of 2,500,000 sets yearly, with units whose factory selling price averages \$20.

Seven additional licenses have been granted since the settlement, but ten others have been cancelled, so that the net result is in the direction of reduction in number.

While present set licenses run until 1937, with the privilege of renewal for an additional five years at the option of the individual licensee, there are other conditions imposed in the license agreements which permit of rapid weeding out of inefficient manufacturers, especially under present economic conditions. Clauses in the license contract provide that if any licensee falls thirty days behind in payment of his dues, then the RCA, as licensor, may serve notice in writing and at the end of sixty days can cancel the license.

Of course, the question of licensing new applicants and cancelling the licenses of old ones is surrounded with many difficulties and distracting dilemmas. If a license is refused or terminated, there are loud and vociferous individual protests, complaints, pressure and threats. If licenses are granted, equally vigorous protests arise from those "under the umbrella." And the same individual, or company, which protested the loudest until admitted to license, is probably the most vociferous objector to other candidates being granted licenses.

Licensees now pay 5 per cent on chassis and speaker, minus cabinet and tubes. (RCA-Victor and RCA-Radiotron pay the same license fees as any other licensee.) Formerly, a minimum requirement of \$100,000 yearly was specified, but this was dropped under the terms of the settlement decree, and now no minimum is imposed. But as the granting and administration of licenses is entirely discretionary at the hands of the RCA, standards of ordinary business judgment will undoubtedly be employed in future licensing operations, even if not literally specified in advance.

All Shoulders to the Wheel

Stabilization and its accomplishment in radio involves many factors.

The large manufacturers themselves must look toward quality products and the elevation of the level of units produced, rather than to join the "rush to the cellar" to compete with the lowest price merchandise. The large companies have a good deal to answer for in this respect, in their past activity, under the pressure of "competition," in turning out sets of the lowest price bracket.

The dealers can help brace the industry against the storms of cut-price merchandising. Unless the retailer in radio holds to his list price and insists on collecting it, manufacturers who are the victims of price-cutting on their branded lines declare that the radio business will quickly find its way into the hands of stable merchan-

disers in other fields, who know that business cannot be carried on without adequate margin.

But these other necessary moves toward stabilization are all dependent upon stabilized conditions in the manufacturing end, starting with limitation of the production of sets to a number which can be absorbed by the market. This involves careful study of existing factory facilities, and of the ability of concerns to carry on radio merchandising operations.

Stabilization will start with the origin of the merchandise, the manufacturer. Therefore it is especially significant that the settlement of the Government's suit has placed in RCA's hands the materials to build for stabilization, if RCA will exercise its prerogatives of license enforcement and license limitation. In this respect the RCA settlement can speed the day of stabilization for the whole radio industry.

The stage is now set for improved radio industry conditions. It is now up to the actors all along the line to be prompt in taking their cues, and to work toward that stabilization the radio business sorely needs.

Sarnoff on Stabilization

Removal of Uncertainty of Protracted Litigation Will Have a Stabilizing Influence

In an exclusive statement to the Industry, through *Radio Retailing*, David Sarnoff, president of the Radio Corporation of America, says:

Events of the past year have done much to strengthen the position of radio both technically and industrially. Radio communication has been extended, broadcasting has performed a notable service, international broadcasting has been improved in quality and interest value, and new apparatus marking distinct technical advancement has been introduced. Litigation of importance to the entire industry has been terminated.

These developments should give to those in radio encouragement for the year we are just entering. Removal of the uncertainty of protracted litigation will have a stabilizing influence. Nevertheless, stabilization should not imply that the industry has settled into a groove. With generally harmonious conditions prevailing, there should be added opportunity and added incentive for radio to press ahead on scientific lines toward enlarged public services.

The difficulties of the times have had no inherent relationship to the art of radio itself. Radio is still a young, vigorous industry seeking the chance for further growth. It awaits but a rift in the clouds. It will do its share, I am sure, in cooperation with other agencies toward a restoration of better business conditions. There is much work ahead, and there will be many new opportunities.

DAVID SARNOFF, *President*
Radio Corporation of America

With Our COMPLIMENTS

A free subscription to a broadcasting publication—or two tickets to a movie—converts front door hostility into front room friendliness

THE way to win the war against depression is to wage an *aggressive* plan of battle, says W. L. McAllister, of Yates-McAllister's Five Point Radio Shop, Birmingham, Alabama. McAllister "keeps on keeping on." He works while others sleep and closes where others give up.

"Five Points" is out of the high rent down town district, being situated in the heart of one of the better residential suburbs of Birmingham. Now, Mr. McAllister might sit around all day and wait for business to walk in the door. But this isn't waging *aggressive* warfare. You guessed it! Mr. McAllister believes in pushing door bells. And when the door opens . . . But let this gentleman, himself, tell us about his strategy:

"In the first place I know the name and address of every family in my territory," he relates. "And I know who the head of the house works for. With this information I greet the woman with her name and tell her mine. More than likely she is about ready to slam the door in my face but I inform her that I have a little gift for her. Then I at once show her a copy of *Radio News*, a local paper which carries all radio programs and, incidentally, one of my own advertisements. I offer to give this magazine to her provided she has a radio. I also find out the kind of radio she has and get permission to place one of my stickers on the back of it offering my services in case needed. If the prospect does not have a radio I offer her two complimentary tickets to a theater instead of *Radio News*. Then I suggest that I have several latest model radios out in my car and will be glad to give her a free demonstration. If she permits I place the set in her house.

"No selling is attempted at the first call but a salesman later calls back on those who appear to be warm prospects. By getting the name and model of the radio already in use we can ascertain whether the pros-



pect is interested in a trade-in.

"This solicitation is inexpensive, it requires only a little time, but it brings in plenty of returns in the way of customers. The radio paper and the theater tickets cost me nothing as they are given my firm in consideration of the free advertising I am doing for these projects. We distribute 300 copies of the paper each week. It strikes me a dealer is doing a good turn for the radio industry and himself in particular by stirring up all interest possible in radio programs and radio performers, which is really the mission of a radio paper."

That the concern has succeeded may be judged from the fact that its volume of business has run from \$30,000 to \$40,000 annually. "A radio a day keeps the wolf away," says McAllister, and he believes in getting out regularly to see that no wolves are around. Where some salesmen take an hour for lunch he takes 15 minutes. He also works 12 hours a day, but he advises his salesmen to take time off early in the afternoon and freshen themselves up for two or three hours work during the evening, when most sales are made.

"Satisfied users are, after all, the best sources of prospects," concludes Mr. McAllister. "Consequently we make it a habit to call back on a new customer one week from the time his set was installed. By again mentioning our 'free subscription' or 'two ticket' offer—available to the friends of Mr. Customer—we gather the names of at least two worthwhile prospects and frequently three or four.

"I feel that, in selling a prospect a radio set, I am giving him more, in enjoyment value, than he is giving me in dollars. Therefore I never am in a negative frame of mind when canvassing even the coldest prospect.

McAllister aims to keep all expenses in direct proportion to sales. Even such ordinarily fixed items as clerical hire and store rent are based on a minimum fixed obligation and the balance on a sliding scale according to the gross billings, which are computed at the end of each month.



RADIO

REPAIRS
OF ALL KINDS
PLOESSER RADIO
Phone 2-7790, 1140 W. Tusc. St.

Authorized Radio Service—Any Make

LET US FIX IT

No Charge for Estimate Calls
PLOESSER RADIO
Dial 2-7790 1140 W. Tusc. St.

RADIO

REPAIRS
of all kind

DIAL 2-7790 ANY TIME
PLOESSER RADIO
1140 Tusc. W. Open Evenings.

MICROPHONE
FREE this week only
with the purchase of new quick-heating type, screen-grid
224-A RADIO TUBE
"TRICK" BROADCASTING
is accomplished by hooking this mike to your radio or loud speaker.

WATCH THIS STORE FOR WEEKLY BARGAINS
PLOESSER RADIO
Open Evenings
1140 TUSC. ST. W.

COST - \$21.68

Effective Publicity—53 inches

How Ploesser secured a maximum of advertising effectiveness at a minimum of expense

TWO things stand out in the publicity efforts of the Ploesser Radio and Electric Company, Canton, Ohio: the attention power of its two inch, single column ads and the amount of free publicity which rides with them.

For the former Don Ploesser depends upon the use of black and white cuts. These "spots" arrest attention like semaphores and are as effective as twice this amount of ordinary type copy. They are the idea of C. A. Hoberdier, his partner, who designed them.

Capitalizing on the fact that he is an advertiser and on a personal friendship basis with the editor of his local newspaper, Mr. Ploesser never misses a chance to get his name and his radio activities before the public. Witness the accompanying news items, which appeared concurrently with his small advertisements.

What editorial publicity subjects can a radio dealer-service organization feed its local paper? Here are some headline suggestions culled from the files of our Canton friend: Designs New Radio Instruments; Old Sets Now Retuned By (Blank's) Special Equipment; Dealer Blank Takes Trip to Factory; Trick Broadcasting in Home Explained; Local Firm Agent for New Radio.

It takes a little time and effort, and some ingenuity, to concoct items such as these—but it's worth it. Why spend dollars for space when you can get it for nothing—by pushing the pencil a bit now and then?

It cost Mr. Ploesser a total of \$21.68 for the four two inch ads illustrated here. With them he secured 45 inches of editorial reading matter, or a total of 53 inches of highly effective publicity. Figure out the net cost, per inch, for yourself.

In this case the Ploesser Radio Company designs and assembles its own testing instruments. However, publicity, on factory-made equipment is just as acceptable.

Everyone is interested in the marvels of science. This source for subjects is wide and varied. Consider, for example, the publicity possibilities for a dealer who assumes the role of "Radio Magician" described in the November issue of this magazine.



Black and white "spot" ads, actual size 2 in., one column, (top of page) secure unusual attention at small cost. When this paid publicity is supplemented by reader-interest articles, total advertising value is often tripled

Automobile-Radio . . .

This Summer's STABILIZER

AS A STABILIZING FACTOR, especially for combating summer slump, automobile-radio will be the trade's most powerful ally during the next seven months. Elsewhere are given the sales figures for the past three years. Note the rapid growth of public interest in sets for motor cars. And note particularly how the demand for motor car radio, from April to October, (Curve A) fills up the valley caused by drop in demand for home receivers (Curve B).

When the public moves outdoors the radio dealer should change his sales tactics accordingly, pushing those things which are seasonal—and suited to the immediate requirements of the consumer.

This opportunity for increasing gross volume, thus placing one's business on a sounder footing, should not be neglected. Today's auto-radio sets are priced within reach of all car owners. They are readily installed and function satisfactorily.

The following account of how a radio concern in Ohio has obtained its full share of this business supplies further evidence of the possibilities in this direction.

How Buescher Radio Co. Sold Sets for Cars last Summer

LAST May the Buescher Radio Company, Lakewood, Ohio, decided to exploit the motor car market in a big way. The fact that this concern is now one of the largest sales outlets for car sets in northern Ohio indicates the success of the methods used.

In line with *Radio Retailing's* suggestion to first "Roll Your Own," Ralph Borden, manager, installed sets in the two cars operated by his salesmen. All during the summer months these cars travelled the streets of Lakewood and Cleveland proper. Most of the time, whether parked or in motion, the radio was turned on.

But, to quote Captain Henry of "Show Boat" fame, this was "only the beginning!" These men were supplied with the names of all registered car owners and of Buescher's radio customers. They systematically canvassed these logical prospects within specifically assigned territories. They were required to obtain, from each contact, the names of other likely buyers, thus eliminating aimless and time-wasting travel.

Ninety per cent of all orders resulted from sales-car demonstrations, according to Mr. Borden.

GAS STATION EMPLOYEES UTILIZED

Recognizing the value of a close tie-in with the automobile supply business, Borden appointed as sub-agents on a commission basis two car servicers in the employ of local gas stations. These attendants, incidentally, had purchased and installed radio sets in their own automobiles. These cars were kept parked in the yards adjacent to the stations—with the sets turned on a large part of

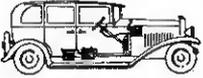
the time, thus "exposing" the attractions of auto-radio to a constant stream of motorists. Many times a day these attendants were called upon to demonstrate their model and answer questions. While a few direct sales were closed the general procedure was to obtain the name and address of the prospect and immediately refer it to the Buescher salesman.

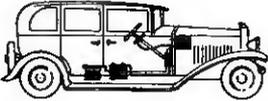
Another smart tie-in with the automobile trade was as follows: When possible, especially if a new automobile salesroom was being opened, a radio set was installed in one of the floor model cars. Guests, attending these openings, proved unusually productive prospects. Incidentally Buescher was thus able to provide a welcome musical background for such an event. Naturally, a radio salesman was always present. This idea worked so well that it has been continued throughout the winter months. Recently a small microphone has been hooked in, thus making the introduction of interesting announcements possible through the car's radio speaker.

WINDOW DISPLAYS, CHANGED FREQUENTLY

At the store, auto sets were displayed *continuously* in window trims which were changed weekly throughout June, July and August. One week the setting would be devoted exclusively to auto-radio, the next to general radio merchandise, with a motor car set as a part of this display. Store demonstrations were used only as the first step leading to an actual road test. Frequently a salesman was assigned to drive out to the prospect's home and take the entire family for a radio ride.

34,000  Sets in 1930

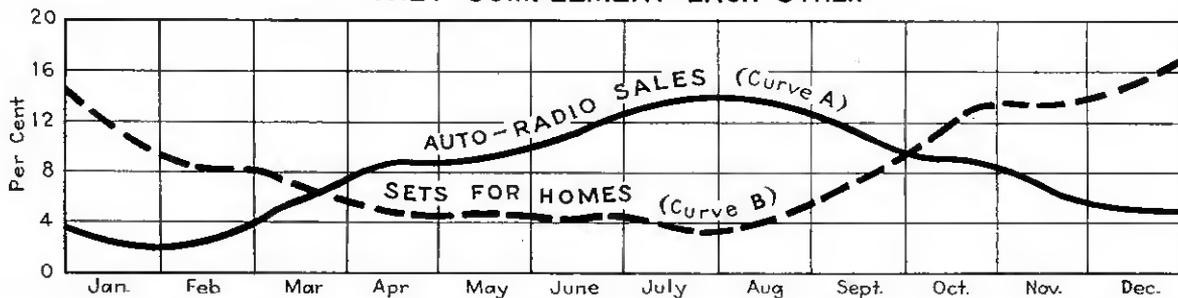
108,000  Sets in 1931

143,000  Sets in 1932

Total retail sales, 1932, including accessories, \$9,580,000

*Motor cars equipped at factory with roof antenna,
86% of the total number of 1933 passenger models*

THEY COMPLEMENT EACH OTHER



"And don't overlook those special outdoor affairs such as local bazaars," Mr. Borden advises. "For example we exhibited, last summer, at the Lakewood Elks' Circus. Besides our booth in the main display tent we were right on the job with demonstration cars and took hundreds for trial spins. No difficulty was experienced in securing the names and addresses of many leads which were worth following up. Twenty per cent of those signing the special blanks provided stated that a radio set for their car was the next convenience purchase contemplated.

P. A. TIED IN WITH A. R.

Later in the summer Buescher secured excellent publicity by cooperating with the Lakewood Chamber of Commerce who had declared a "Value Day" in the city to promote local business. For four days in advance, the Buescher truck bearing huge posters proclaiming "Value Day," travelled the streets of the city. A double speaker and a hook-up similar to an auto-radio installation was used as well as an amplifying system for playing records and broadcasting speeches. The fact that the radio equipment was furnished by courtesy of the Buescher Radio Company was announced at frequent intervals. While such advertising was of a general nature the auto-radio idea itself was brought to the attention of the public. Although sales could not be directly traced to this stunt, the store's auto-radio business was heavier in the weeks following.

The company thought enough of this type of publicity to offer its radio services in a Christmas buying campaign sponsored by the Chamber for 10 days preceding the holiday. In this instance the truck came from an automobile concern, the signs by the Chamber of Commerce and the broadcasting outfit by Buescher. Campaign plans included not only street travel with a Santa Claus perched on the truck but visits to the local schools.

The month of August, during the height of vacation

time, was the best of the year for auto-radios according to Borden. During this period he made one or more installations every day.

While auto-radio had its biggest play during the summer months Mr. Borden found it worth while to maintain his demonstrator cars in active operation throughout the winter. He also has established his service and installation department on a full-time basis.

The Buescher Radio Company has had the courage to extend its activities into the motor car field, and has been amply rewarded. Thirty per cent of its radio business, last summer, came as a result of this decision.

"We increased gross volume to profit-sustaining proportions last year," concludes Mr. Borden, "because we believed in auto-radio, equipped our salesmen's cars to demonstrate it, went easy on newspaper advertising, obtaining prospects by more direct contact methods and employed an installation expert."

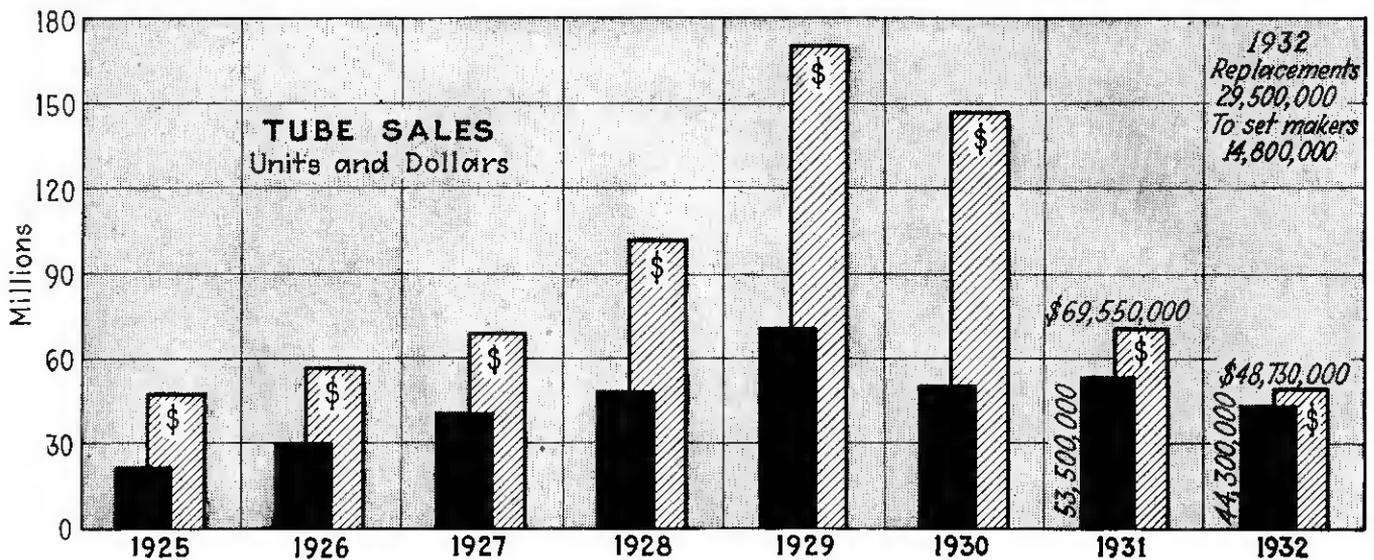
For further information about the problems involved in merchandising auto-radio and how the radio dealer can participate in this lucrative market, we suggest that you again review the timely articles on this subject which have appeared in the two preceding issues of "Radio Retailing."



"Congratulations!" said the Mayor of Lakewood to Mr. Buescher. "Thanks for your auto-radio publicity, boosting Value Day."

The TUBE Situation...

*A Punch-Drunk Industry Shakes
Sees Its Way to Win Out*



By Ray V. Sutcliffe

THE outlook for stabilization of the tube industry is improving. This, despite the discouraging performances of recent months. Practical cooperation, between the tube makers, is becoming an actuality, special deals are losing favor, lists—at the new low levels—bid fair to stay unchanged, for a reasonable length of time at least. There remains, however, much to be done.

Nineteen twenty-nine was the tube industry's golden year—69,000,000 tubes sold; retail value, \$172,000,000. Last year unit sales for domestic sets were 44,300,000—a 14 per cent decrease over '29—but the retail dollars figure fell off, 21 millions of dollars—a 30 per cent decrease. This, in the face of an increase of approximately five million sets in active use needing new tubes.

Making all proper allowance for the depression and for legitimate lower lists, due to economies in tube manufacture, clearly things have gone wrong with the tube industry. Those "things" are pretty well known. Each tube maker playing a lone game, "devil take the hind most," overproduction, special deals, below cost quotations, dumping. In other words, a "battle royal," from which the survivors have emerged sadder but wiser men—we are convinced from personal heart-to-heart talks with the survivors—and with every desire to cooperate and play the game soundly from now on.

Yes, the outlook for the stabilization of tube prices, discounts and selling prices is brighter than at any time during the past three years. We wish as much could be

said for the common-sense control of new tube designs—but here, also, a certain measure of cooperation has been reached. A dozen executives represent practically all the substantial interests involved in the stabilization of the tube industry, from the manufacturers' angle. They meet frequently. They are learning to give as well as to take, and to reconcile their differences for the common good.

What then are the steps for stabilization that now need to be taken?

Two Retarding Factors

There are two major factors that are at present retarding the stabilization of tube selling on a profit basis. Of immediate concern are the elements of low lists and wide discounts. The former discourages promotional selling; the latter leads invariably to price cutting. "And," to quote a very responsible top executive whom I interviewed last week, "the retailer will eventually cut tube quotations if his margin exceeds 40 per cent. This has meant that, in turn, the tube manufacturer must establish a new and lower scale of list prices. If radio dealers will now proceed to base their operating expenses on present prices, if they will be con-

...Order Emerging from Chaos

Off the Fog of Battle and —But Dealers Must Help

tent with a reasonable, an equitable, discount, we will do our part. Manufacturers' tube inventories are now lower than for the past five years. Special deals and bonuses are being eliminated. We stand ready to 'fight it out' on today's basis if the dealers and jobbers of the country will cease their demands for excessive margins and instead will devote their efforts to selling tubes."

The *second* disturbing factor—not yet acute at the ultimate point of sale but one that soon will embarrass dealers if allowed to run its present rampant course—is that of this plague of new tubes.

Again we quote a well known executive, this time a set maker: "More than thirty-two new types of tubes were brought out last year, increasing the total number of types which dealers and service organizations should stock to ninety. Right now the tube manufacturers have requests from set makers for about 120 additional new types. Such an avalanche of new tubes clearly would not be for the best interests of the industry. At present, any set manufacturer who for selfish reasons wants a new tube, can find some tube concern who will make it. Such an advantage—if it has sales merit, which is doubtful—is but short lived. But the damage is done. Will it come to pass that each set has its own tubes and that replacements must be ordered from the set maker's factory, as in England? If so this will definitely mark the end of creative salesmanship in the replacement tube market."

"Radio Retailing" Recommends

So much for cause and effect. At this time, when the tube makers are in closer and more friendly contact with one another than for many years, what should be done to remedy matters?

Because of its duty to the industry it serves, *Radio Retailing* submits the following recommendations. Note that the dealer, the jobber and the set maker, as well as the tube manufacturer, must do his part in this cooperative plan for stabilizing the tube situation:

TO DEALERS AND JOBBERS—Without your moral and actual support the tube companies cannot maintain a stable schedule of prices and discounts. Therefore—

Do business only with reliable tube manufacturers, whose policies are fixed.

Dealers, cease your demands for more than a 40

per cent margin. Greater spreads invariably lead to price cutting and the vicious circle of lower lists.

Dig in where you are. Fight it out on today's line.

Call on as many set owners as possible . . . Sell tubes for replacements by testing them in the home and at regular intervals (In 1932 no less than 55,000,000 tubes should have been replaced. Actually, we sold this market but 29,500,000.)

TO THE SET MAKERS—You can help your dealers and jobbers make money from tubes in two ways:

1. Cease dumping tubes, purchased at less than jobber quotations, on the open market.

2. Use standard tubes, those already provided by the tube makers, in your set designs whenever possible. Do not insist upon the creation of special types, having slight practical advantages, just to secure a temporary sales advantage.

AND TO THE TUBE MANUFACTURER—Cooperation and stabilization are inseparable. Stabilization cannot be had without mutual consent. Therefore we say:

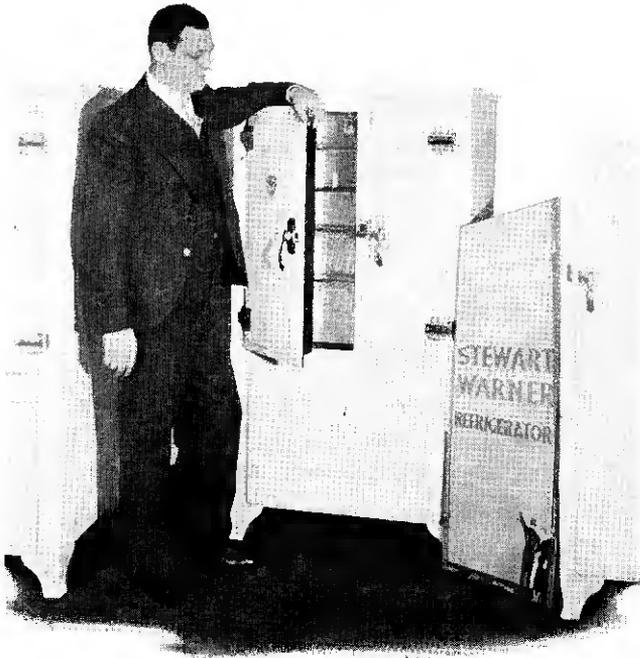
1. Through concerted action, lay off special deals, bonuses, long discounts and free tube inducements. Be merchandisers, not concessionaries. Permanent business institutions never have been built, and never will be built, on any such short-sighted, profit-destroying, confidence-wrecking basis.

2. Quote discounts equitable to all parties involved, from manufacturer to consumer, and hold to them.

3. A six-month tube manufacturer's replacement guarantee is ample. Three months, or less, would be better.

4. Perfect that admirable plan for joint committee control of new tube announcements. Hold new tube releases to a minimum—based on proven intrinsic merit and actual need rather than on the opinion of a tube or set engineer who, necessarily, cannot see the sales picture in its entirety.

On pages 20 and 21, this issue, we point out the opportunity for stabilizing the set business which now faces the Radio Corporation of America, because of its control of patents. This chance to be of service also is present in the tube industry. Let RCA take the initiative. Why not establish a quota basis, as in the lamp field—and also set up a cooperative plan for making it worth while to cultivate the replacement market?



52 in Six Weeks

Lee's Radio Store Claims Refrigeration Sales Record

LEE'S Radio Store is located in the center of one of Chicago's thriving outlying shopping districts. Lee Klein had sold radios, musical instruments and electric appliances for eight years. Last summer he became convinced there was money in electric refrigerators and proved it by selling 52 in six weeks.

Regarding this venture into a new field, Mr. Klein said, "Naturally we advertised the 'Leader,' a 4 cu. ft. box retailing at \$99.75, but the majority of our sales were made on larger and higher priced models. The average sale was \$178. Contrary to popular opinion, low prices seldom sell refrigerators. Cut prices may bring people into the store but, after all, they are fundamentally interested in what they get in a refrigerator. Once they see the merchandise, the saving in dollars fades into insignificance beside the extra convenience and greater beauty of the better models. Many a time a customer has come back and thanked me for selling her a larger model than she originally thought she wanted. Until you have one, you don't realize how much you'll want to keep in an electric refrigerator.

"How did we contact the prospects? Radio advertising pulled them in for us. One of the most successful stunts was a 15-minute dinner-time musical program. Eddie Loftus, one of the best entertainers on the air,

put us over the top with his catchy tunes and clever presentation of our unique sales plans.

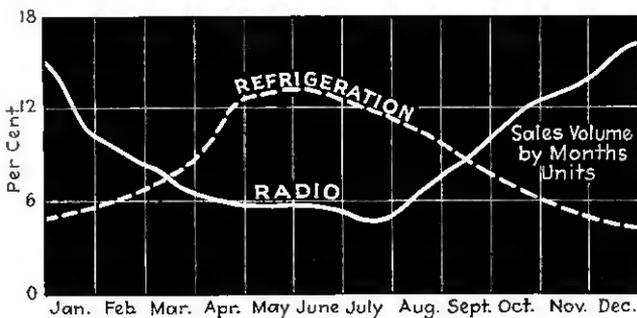
"One time we offered a \$10 allowance on every box purchased, provided the customer turned in his old ice box. This allowance was given only to the *first five people* telephoning in each night after Eddie gave out the telephone number. He explained over the air that these old boxes would be given to charitable institutions and needy families. During the broadcast he urged folks to communicate with us and register a request for a free ice-box. Dwelling on the charitable phase of this plan gave Eddie a good chance to build up good will for Lee's."

Lee's Radio Store has two phones and the words would hardly be out of the announcer's mouth before both would begin to ring. The name and address of every person calling was taken down.

A new stunt was originated and put on the air before the novelty of the old one wore off. Some sort of premium or inducement was offered each time.

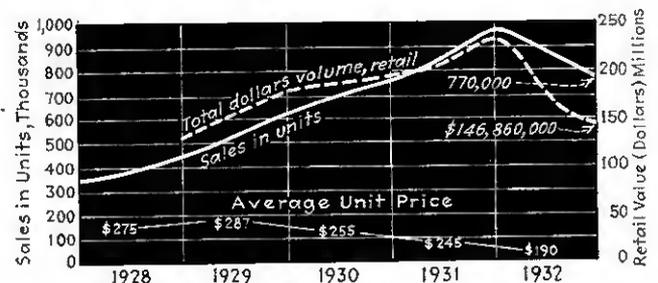
"The trick is to get them into the store," concludes Mr. Klein. "Peppy broadcasts, with a special inducement come-on, worked best for us. Liberal credit terms are next in importance—but the product MUST be well known and absolutely reliable."

Electric Refrigeration Statistics—Year 1932



Note that the drop-off in retail dollars volume for 1932 is more marked than that in the number of refrigeration units sold. This is due to the fact that the average unit sales price in 1932 was \$190, whereas in 1931 it was \$245.

There are 4,300,000 electric refrigerators now in use. This number represents 21.6% of the total number of



19,874,500 wired homes throughout the U. S. Mathematically speaking, this market is 78.4% unsaturated.

It is now generally admitted that electric refrigeration is the best complementary line the radio dealer has yet located. As a stabilizing activity it is unexcelled—see graph at right (above).

Around the TURNTABLE

with Richard Gilbert



Diamond Lil (Mae West) records songs for Brunswick from her Paramount Picture, "She Done Him Wrong"

COLUMBIA. The new Royal Blue Records are catching on. Their noiseless surface and sensitivity to volume and frequency responses put these discs, mechanically, in the first rate class. Furthermore, Columbia has hit upon a system of release which may be calculated to match the dealers' wishes these days for discriminate and economical buying. The new deal from Bridgeport offers the opportunity of placing a standing order for four releases each of four records every two weeks—a total of sixteen records every fortnight—sales guaranteed as per special dealer agreement. The terms are forty cents per record (10-inch class).

RUDY VALLEE and his orchestra have become the star band of this company: they can be depended upon to furnish smooth, appealing dance music, as in the most recent recording—*Pretending You Care* and *The Whisper Waltz* (No. 2746D) and usually initiate one or two sensational hits. Ted Lewis concocted a timely anthem, when he recently appeared at the RKO Roxy Theatre, and recorded it immediately: *Buy American*. It is coupled with a sweet foxtrot by Tin Pan Alley's newest and most successful composer, Harry Woods, *Try a Little Tenderness* (No. 2748D). First recordings are *Lovey* and *Black-Eyed Susan Brozen* (No. 2749D) by Mark Fisher and his Edgewater Beach Hotel Orchestra of Chicago's popular dance rendezvous.

The outstanding Columbia dance disc of the month is Art Kassel and his Kassels in the Air interpreting the equally prominent tune from Kate Smith's movie hit "Hello Everybody!"—*Moon Song*, coupled with another from the same picture, *Twenty Million People* (No. 2742D). Feature this disc, it's one of the very best.

IN THE classical field, Columbia releases a splendid European recording of the third act prelude from Wagner's *DIE MEISTERSINGER* together with the orchestra music incidental to the *Dance of the Apprentices* from the same opera. Bruno Walter directs the British Symphony Orchestra in these recordings which are especially appropriate to the Fiftieth Anniversary of the great Wagner's death. Nos. 68090 and 68091. The Masterwork set of the month is a five disc complete recording of the four Chopin *Ballades*—possibly the greatest utterances of the keyboard master. The recording is tremendously vivid; the eminent French pianist, Robert Casadesus, gives deeply felt readings. Suggest this set (and don't forget the new Columbia \$1 per disc price) to all piano enthusiasts and music students in general. Set No. 179.

VICTOR. Two important musical anniversaries are celebrated this month: those of Brahms (100th anniversary of his birth) and Wagner (mentioned above). The current Metropolitan Opera broadcasts, followed closely by millions of listeners and prospective record purchasers, will assist in the sale of the month's albums. First, Rose Bampton, newcomer at the Met, sings four Brahms solos (*Lieder*, meaning "songs") heretofore unrecorded. In the same set this brilliant contralto sings in duet with Conrad Thibault, rising young Philadelphia baritone, and Mr. Thibault sings four solos. Twelve beautiful Brahms songs, with piano accompaniment. Recommend this set, No. M175, to your most musical customers. It contains the sort of music the perennial record collector has long been awaiting . . . The other album, No. M167, contains the stirring finale to Wagner's music drama, *Siegfried*. Lauritz Melchior, the Metropolitan's foremost German tenor, and Florence Easton, a soprano well-loved by thousands of Americans, delineate the famous rôles of Siegfried and Brünnhilde and Robert Heger, famous Wagnerian exponent, conducts the Royal Opera Orchestra, London—all of which makes this exceptional love music irresistible to opera enthusiasts everywhere. Offer also the other Victor *Siegfried* albums. Together with Sets Nos. M83 and M161, this late addition practically completes the recording of the entire opera, one of the most fascinating portions of the gigantic cycle of *The Nibelungen Ring*. Good salesmanship should net some nice returns from these three albums . . . The Caruso record, released last fall and captioned widely as "*Caruso Sings Again*," had tremendous sales, and now Victor follows up with two more regenerated versions of *Rigoletto*, *Aida* and *Pearl Fishers* arias by the greatest tenor voice of all time together with new and illuminating orchestra accompaniments by Nathaniel Shilkret's orchestra (Nos. 1616 and 7770). Make another window display featuring these unforgettable discs.

VICTOR populars are unusually intriguing. The art of recording hasn't reached greater heights than in Ray Noble's London recording of two current English hits: *Looking on the Bright Side of Life* and *We've Got the Moon and Sixpence* (No. 24212). It's an ideal demonstration number . . . The *Music in the Air* picture record went over big last month. A new one is by Paul Whiteman and his orchestra entitled *A Night at the Biltmore*, introducing twelve popular tunes in tabloid fashion and featuring Paul's
(Please turn to page 32)

Boil-Down of the

150,000 RMA SEALS ALREADY SOLD

Plan Bids Fair to be Adopted by All Responsible Set Makers

"Thanks to *Radio Retailing* and other trade editors, the RMA seal merchandising plan has started with great promise," writes Bond Geddes, general manager of the Radio Manufacturers Association, from its new offices in Washington, D. C.

"Its initial success is assured with 150,000 seals already sold," he continues, "and most of them gone to the trade which has welcomed the selling stimulus and aid to quality presentation which this seal on an accredited set provides."

The next step is to promote the value of this seal on radio merchandise with the general public. This is a big job requiring financing and careful planning but RMA has it well in mind, according to Mr. Geddes.

Following is the list of the companies now placing this seal on its sets. Many other manufacturers have promised to adopt it shortly.

All American Mohawk, Audiola, Automatic Radio Mfg. Co., Belmont, the Capehart, Colonial, Crosley, Essex, Galvin, Grigsby-Grunow, Hammarlund, Howard Radio.

Also the Insuline Corp., International, Colin B. Kennedy, National Company, Philmore, Pierce Airo, Remler, Transformer Corp. of America, Trav-Ler Radio & Television, United American Bosch, and the U. S. Radio & Television.

National Union Issues Tube Data Book

National Union Radio Corp., 400 Madison Ave., New York City, has issued a 24 page "Tube Data Book" for use by dealers and service men. It is made up entirely of reprints of the set specifications which have appeared in *Radio Retailing* over the last six years, with special attention to the tube equipment of the receivers. It contains an alphabetical list of set manufacturers, the models each concern put out and the tubes used. Many of these sheets contain additional specifications on the sets.

RMA Proceeds With Parts Stabilization Plans

Further standardization of parts made for both set manufacturing and replacement use, a stabilizing influence which will be of practical value to the industry, is now planned by the RMA. Over 30 of the country's leading engineers met recently to discuss this problem at the Hotel Cleve-

land, Cleveland, Ohio, under the auspices of the Association's Standards Section, of which Virgil M. Graham (Stromberg) is chairman. Floyd Best of the Production Standards Committee (Chicago Telephone) rendered a report on preliminary work.

The following men were appointed chairmen for the different divisions required by parts classifications: D. S. W. Kelly (Allen-Bradley), carbon resistors; H. G. Richter (Flectrad), wire wound resistors; E. R. Stoekle (Centralab), variable resistors; J. S. Williams (P. R. Mallory) fixed condensers; N. P. Bloom (Adler), cabinets; J. C. McGinley (Meissner), r.f. coils; R. T. Pierson (General Cable), audio and power coils; J. A. Comstock (Acme), transformers and chokes; T. A. White (Jensen), speakers; M. H. Bennett (Scoville), variable condensers; R. G. Zender (Lenz), hookup and connection wire; E. R. Peel (Eby), sockets.

Stewart, New Auto-Radio Maker

The Stewart Radio and Television Company, Detroit, has been organized, with offices in that city, for the express purpose of making auto-radio receivers of all-electric variety. "Stewart" receivers will have "Floating Tone Control," an exclusive feature.

Officers of the company are: Mark Rafelson, president; E. J. Stewart, general manager; Ed Oxner, chief engineer.

Detective With Dog



This is Thurston Hall (Jim Hanvey to you), detective-hero of *Sat. Eve. Post* Cohen's new Westinghouse-sponsored thriller, "The Townsend Murder Mystery." Tell dial-twirlers to sample NBC any Tuesday, Thursday or Saturday at 7:45 E.S.T.



New Export Manager for Zenith

Ed Hefter, formerly eastern sales manager for Zenith, has been appointed export manager, with headquarters at the Chicago factory. He has been active in the radio business since 1925.

Radio Tax Returns 80% Below Expectations

The 5 per cent excise tax slapped on radio by Congress last June is failing to produce anywhere near the revenue predicted by the Treasury Department, collection figures just released indicate. Radio was expected to pour \$11,000,000 into government coffers annually and returns totalled only \$1,184,510 during the last half of '32, 80 per cent under the estimate for that period.

Monthly returns are recorded as follows:

June-July	\$32,848
August	76,445
September	165,710
October	218,722
November	298,577
December	392,204

Business conditions have compelled many radio manufacturers to largely absorb the excise tax and industry leaders generally believe that the cost of collection to the government has further greatly reduced the return to the Treasury. The tax, apparently, is more of a burden to manufacturers than a source of appreciable revenue to the government.

L. G. Pacent Forms Consulting Engineering Firm

L. G. Pacent, of the Pacent Electric Co., New York, has formed a new consulting engineering firm with laboratories at Little

News of the Month

Neck, Long Island. B. H. Noden is to be secretary and treasurer, H. C. Likel, a member of the engineering staff.

Pacent is to continue as president and director of the Pacent Electric Company but will devote most of his time to the new venture with offices at 79 Madison Ave., New York City. An arrangement has been made whereby Pacent Electric continues to receive the benefit of his research and development talents.

DITZELL SALES MGR. MAJESTIC

Harry Alter to Factory

A new plan of sales contact between the factory and Majestic distributors has just been inaugurated by the Grigsby-Grunow Company of Chicago. As a result, the sales activities on all Majestic products will be closely co-ordinated and the control of these activities embracing refrigerators, radios and tubes will be placed in the hands of one directing executive. This responsibility has been assigned to John F. Ditzell, previously assistant vice-president in charge of refrigeration, who now becomes assistant vice-president and general sales manager.

When asked how this change of policy will affect the operations in the field Mr. Ditzell stated that further announcements on this subject will be made a little later. "Obviously," said he, "it will necessitate considerable rearrangement of our field operations. As now contemplated, we will be enabled to give far closer cooperation to our distributors, and because of a greater degree of co-ordination in our selling activities, we will also eliminate a certain tendency to duplicate effort in the field."

The second step in re-organization plans brings Harry Alter from his previous position of manager of the Northern Illinois Division office (the downtown Majestic display room) to the factory where he will be assistant general sales manager, and will work directly with Mr. Ditzell in developing and maintaining the new set-up.

Peirce Returns to Peirce-Phelps

W. G. (Jim) Peirce, partner and founder of Peirce-Phelps, Inc., Pennsylvania distributor of Majestic radios and refrigerators, who obtained a leave of absence two years ago to become assistant general manager of Grigsby-Grunow, has returned to the active management of his former company.

Jim resumed his old position as chairman of the board March 1, when the G-G resignation became effective.

Edison Hotel Plans N. Y. Show

The Hotel Edison, New York, will again stage a radio show under the direction of Harry Goldman. Preview exhibit of 1933 models is scheduled for April 10, 11 and 12.

REFRIGERATION BUREAU STARTS "LEGION OF HONOR" CONTEST

Prizes Offered to Stimulate Retail Sales Cooperation

On March 15, the Electric Refrigeration Bureau opens its "Legion of Honor" contest designed to stimulate cooperative sales effort among the various types of retail refrigeration outlets. The contest, concluding April 15, is open to central station men, Bureau members and managers of Electrical Leagues or Associations in each of the 11 regional divisions of the country. From evidence submitted, the man who is doing the most meritorious local work in bringing about effective cooperation among retail sales outlets will be chosen and awarded a gold cup. Runners-up from the remaining 10 divisions receiving a silver cup and membership in the Legion.

The following points will be among the chief factors governing the awards:

1. Has the contestant been a leader in establishing a local Bureau or in the present formation of one, or in carrying on the functions of a local Bureau through a local Electric League?

2. How successful has he been in securing local cooperation? How many electric refrigerator sales outlets are there in the community? How many are cooperat-

ing in any concerted plan of advertising or sales promotion?

3. What has he done or is he doing to establish local cooperative electric refrigeration, newspaper, outdoor or radio advertising?

4. What effort is he making to institute a local cooperative electric refrigeration exhibit or other sales promotional plan?

5. To what extent did he urge the central station and local dealers to enter the last Christmas display contest?

6. What other cooperative refrigeration endeavors is he now fostering?

Judges are: Edgar Kobak, vice-president, McGraw-Hill Publishing Co.; A. W. Berresford, managing director, N.E.L.A., and J. C. Sterling of McCalls Magazine.

E. B. Shiddell Joins Columbia

E. B. Shiddell, widely known to the music trade, both here and abroad, has joined the Columbia Phonograph Co., Inc., in the capacity of sales manager of the Phonograph and Record Division.

Wild and Woolly and Rarin' to Go



"Are we downhearted? NO!" The depression holds no terrors for these mighty men of Milwaukee, or for the Wisconsin Radio, Refrigeration and Appliance Association who staged its annual Stag Party last month—300 attending. From left to right, top row: L. T. Robertson, Augie D'Amico, W. F. Seemuth and B. S. Wisniewski. And in front, their hands full of \$1,000 bills—in fake money: C. J. Morris, C. W. Hamilton and Gordon Ische

Heads 90-Year Old New Orleans Music House



Paul S. Felder

Paul S. Felder has been elected president of Philip Werlein, Ltd., New Orleans, La., "the oldest music house in the South." He succeeds the late J. Parham Werlein. Mr. Felder is prominently identified with most of the worthwhile civic activities of that city.

This step also elevates Parker M. Harris to the post of general manager of this firm, which was established in 1842.

Higher Power Broadcasting Urged By Three Associations

In a joint report issued to members by the RMA, NELA and NEMA, national radio and electrical associations, higher power broadcasting is urged as a primary means of further reducing electrical interference. Copies of the report mailed to designers of both electrical appliances and radio receivers also contain equipment construction suggestions which aid in the reduction of such noise.

Better installation of receivers by the retailer comes in for its share of discussion in the report, it being pointed out that much can be accomplished by erecting antennas effecting a minimum of coupling with house wiring and other electrical circuits. Radio-frequency filters and special antenna systems are also discussed.

Municipal ordinances relating to radio interference are declared generally ineffective, the cooperating associations maintaining that these frequently set up standards which eventually become more of a hindrance than a help in the solution of the interference problem.

Kahn Heads Standard Transformer

"Jerry" Kahn, who formed the Standard Transformer Corporation of Chicago in 1930, serving it as vice-president in charge of sales and advertising since that time, is now president of the organization. Action was taken at a recent stockholders meeting when his election was unanimously effected.

Five New Condenser Licenses

License to manufacture dry electrolytic condensers has been granted to Dubilier, Solar, Micamold, Muter and Dumont by P. R. Mallory & Co. Sprague, Electro Formation, Cornell, Condenser Corp. and Aerovox are already operating under similar licenses.

The Republic Distributing Company, Grand Rapids, Mich., has been appointed distributor for Zenith for that area. C. C. Christy is president.

NEW DISTRIBUTORS

GRUNOW CORP.—Grunow Distributors, Inc., New York, serving Manhattan, Bronx, Westchester and part of Conn. Leonard C. Welling and Gus Kraus are the contact men.

INSULINE CORP.—B & O Radio, Inc., Newark, N. J., covering New Jersey north of and including Trenton, also Orange and Rockland counties in New York State—all exclusive.

TRANSFORMER CORP.—Intermountain Appliance Co., Denver, Colo., and O. S. Peterson Co., Los Angeles.

STEWART WARNER—Wholesale Radio Equipment Co., New York City. Handle metropolitan New York and adjacent territory.

COPELAND—Binder Distributing Co., Trenton and Newark, and Essex Distributing Corp., Newark, are working a split-territory arrangement. Binder Co. will cover southern and central Jersey and part of Pennsylvania, while Essex will serve dealers in the northern half of New Jersey. Last year, Binder was sole Copeland distributor throughout northern and central Jersey but decided to concentrate over a smaller area to keep closer personal contact with dealers.

ZENITH—Watson & Wilson, Inc., Los Angeles, Calif., has taken over the southern California and Arizona territory. Radio Equipment Co., Dallas, will distribute in the entire state of Texas. H. R. Curtiss Co., San Francisco, has been granted the northern California section.

UNITED AMERICAN BOSCH—Barrett Electrical Co., St. Louis, Mo., assumes distributorship in that territory. Cleveland Ignition Co., Cleveland, takes over responsibility for that point.

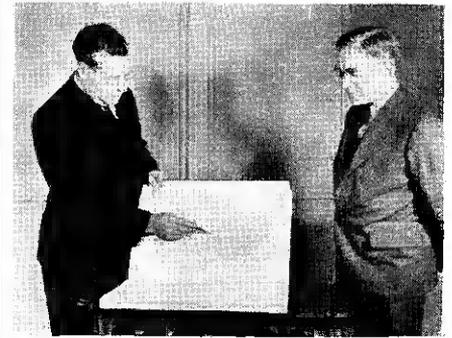
KENRAD—L. P. Naylor will act as sales representative in an extensive eastern territory. Cover Penna., W. Va., Va., N. J., Maryland, Delaware and Dist. of Columbia, working with old jobbers and appointing new ones.

SPARTON has signed with Chapin-Owen Company to cover the market served by Rochester, N. Y. Sales manager E. T. H. Hutchinson recently addressed the organization of the newly appointed distributor for Sparton at Harrisburg, Pa., the General Automotive Supply Company.

TCA, full name Transformer Corporation of America, will be ably represented in its own home town by the well known Peter Sampson. Sampson Electric Co., Tracy-Wells, Columbus, Ohio, and Shasbolt & Boyd Co., Milwaukee, also are recent jobber affiliates. "Clarion" now has a network of over 100 distribution outlets.

A & S Stages Radio Carnival

Abraham & Straus, Brooklyn, department store, staged a "Radio Carnival" to stimulate the sale of consoles with considerable success late last month. The public was attracted by the personal appearance of violinist Rubinoff (co-star with Eddie Cantor) and announcer John S. Young. Display of the Bosch gold cup awarded in its recent radio star popularity contest also attracted attention.



Pullman Dwellers

"Pullman Dwellers" that's what R. I. Petrie, left, and A. M. Taylor, sales manager and director of merchandising, respectively, of the Leonard Refrigerator Co., Detroit, call themselves. They are conducting a series of retail sales schools for Leonard and will be on the road until late in May. The tour, which takes them to 44 key cities, covers more than 18,000 miles.

AROUND THE TURNTABLE

(Continued from page 29)

unique troupe of entertainers, Irene Taylor, Ramona, Peggy Healy, Al Darny, Roy Barge, Pingatore—the wizard of the banjo, Goldie—the sweet trumpeter, Jack Fulton, and Red MacKenzie. We heard this record in the making and it's a wow. No. 3900—list price \$2.00, sell 'em like hot cakes . . . Whiteman also does the hits from George White's new show MELODY (I'D WRITE A SONG and YOU ARE THE SONG) (No. 24238) and EGERN ON THE TEGERNSEE (from MUSIC IN THE AIR) (No. 24225) . . . All the great ictor dance artists are well represented; Ted Weems, Waring's Pennsylvanians, George Olsen (HALLELUJAH, I'M A BUM from Jolson's picture), and Don Bestor, still the rage.

BRUNSWICK. STOP PRESS NEWS! Kate Smith and Mae West are recent additions to Brunswick's galaxy of stars! The "Songbird of the South" and "Diamond Lil" join that imposing array of Brunswick recorders. The "Hello Everybody" girl records four songs from her movie: *Twenty Million People*, *My Queen of Lullaby Land*, *Moon Song* and *Pickaninnies' Heaven* (Nos. 6496 and 6497). Kate's millions of admirers, if they've a turntable in the house, will be wild about these discs . . . Mae West is a hit in pictures. Her first disc, from which you can almost see that peculiar slouching walk, that curled lip and that bold gleam in her eyes, projects *Easy Rider* and *I Like a Guy What Takes His Time* (No. 6493)—hot cha! . . . *Going, Going, Gone*, the Lombardo hit, is available on disc No. 6499. Eddy Duchin does the Gershwin airs from "Pardon My English," *My Cousin in Milwaukee* and *Isn't It a Pity* (No. 6476). Wonderful for demonstration are Fiorito's *Then I Found You* (No. 6493); *Why Can't This Night Go On Forever* (No. 6494) the Casa Loma Orchestra; Ellington's *Any Time, Any Day, Any Where* (No. 6467). Donald Novis makes his disc debut with *The Whisper Waltz* and *Rock-a-Bye Moon* (No. 6489). There are the usual discs by the unusual Mills Brothers, Bing Crosby and other Brunswick's favorites.

SERVICEMEN are Learning to SELL

Coupon Plan Adds 250 New Customers

Editor, Radio Retailing:

Every serviceman has his regular customers but unless new ones are gained each year business eventually dwindles. Here is the dope on a plan that added 250 new customers to my list and brought in \$100 a month net profit during August, September and October. It still accounts for \$45 of my monthly net.

The inclosed free inspection and minor adjustment ticket was bound in a booklet containing similar "sample offer" slips prepared by other local merchants (not radio). Each merchant offered merchandise or service without charge in order to attract new customers. The booklets were sold around town by unemployed men at \$1 each and were considered good investments by the people who bought. Profit from the sales went to the salesmen.

People who would ordinarily hesitate to accept free inspection and minor adjustment offers did not hesitate to avail themselves of ours . . . because they had paid money for the booklets . . . and as a result

many new faces were seen in the shop. We adjusted many receivers free, of course, but there were enough sets requiring replacement parts and major repairs among the group contacted to more than compensate us. Where people needed extensive set repairs but did not

FREE

FREE

THIS COUPON GOOD FOR
**ONE COMPLETE RADIO INSPECTION
AND MINOR ADJUSTMENTS**

VOID AFTER NOV. 1. 1932.

RADIO SERVICE CO.

A. W. DUGAN

WE REPAIR ANY MAKE RADIO

113 Donaldson St.

Phone 193

Fayetteville, N. C.

want it done immediately we left our card with the price of the suggested job noted. These are producing business for us daily.

A. W. DUGAN

Stabilization Through Servicing

Because there are 17,000,000 radio sets now in active use in the United States and because dollar volume from the sale of new sets has fallen off, servicing, as a stabilization factor, is becoming increasingly important. The main income of many radio dealers now comes from this activity.

Those who specialize in service work should give more thought to the business building possibilities involved. The MODERN service man will be alert to his unusual opportunities as a *merchandiser*. During 1933, therefore, he will do these things:

Devote his spare time to *creating* business—by personal canvass, use of the telephone and every other tested promotional method

See that every home he visits has the best radio equipment it can afford

Always demonstrate the superior reception qualities of new tubes

Use only those replacement parts whose quality has stood the test of time

Create respect for his profession by his appearance and conduct

Complete Records Aid Estimator

Radio Retailing Magazine:

One of the most efficient "short-cuts" to good service work, particularly estimating, is a complete filing system. I use an ordinary card file indexed first by makes and then by receiver models. On this goes experience data gleaned from work on each particular model.

Thus, when I am called upon to estimate on a job in connection with a model listed in my files I can take advantage of past experience in holding the price within bounds. I know, for example, that certain makes and models have weaknesses that are easily corrected; that power packs in some models are easily opened up for repair.

This helps a lot in keeping expenses down, profits up.

M. H. DOVER

Ad for Old Sets Sells New Ones

Radio Retailing:

For two weeks I ran this ad in my local newspaper:

"WANTED: Old radio sets and accessories.
Need Magnavox R3 Speakers. Will pay cash."

It brought in many old sets that were bought for a song. This supplied us with special parts no longer obtainable from manufacturers for use in our repair work. It also, much to my surprise, sold new sets and accessories.

Many people who brought in old equipment traded it, with cash, for service work, batteries and tubes. Several were sold new sets. I netted \$30 from the idea after deducting the cost of the ads and the sums paid for old sets. Barter is gaining favor out here in the middle west.

ROGER H. HERTEL

TUBE TIDINGS

March, 1933

E. T. Cunningham Inc.—RCA Radiotron Co., Inc.

Harrison, N. J.

LAUNCH \$200,000 TUBE CAMPAIGN

*Eddie Cantor Proud of
Cunningham Radio Log*



The new Cunningham Radio Log has won the complete approval not only of the trade and the public, but the radio stars themselves, it is stated by Frank Burns, Central Division Sales Manager of E. T. Cunningham, Inc.

Eddie Cantor wrote: "The log is interesting and very useful, indeed, and a swell job, to say the least. I am sure this log will be greatly appreciated by your dealers and it surely would be well worth the price of fifteen cents. I am very proud to have my picture on its cover."

Cunningham has received similar letters from the other stars in the Log.

The price is \$2.50 per 100, imprinted. In lots of 1,000 or more, \$2.25; in lots of 2,500 or more, \$2.00.

Leading Distributors Indorse Almighty Dollar Activity

Prominent distributor executives in all parts of the country are unanimous in their enthusiastic approval of the Almighty Dollar Sales Activity. We quote a few from the New York City area:

M. H. Krich, Pres., Radio Distributing Corp., Newark, N. J.—"The Almighty Dollar Sales Activity is soundly conceived and thoroughly planned."

L. E. Latham, Vice Pres., E. B. Latham & Co., N. Y.—"This is a real proposition for dealers."

Irving Sarnoff, Vice Pres., Bruno-New York, Inc., N. Y.—"The Almighty Dollar Sales Activity is an ingenious method of going to the heart of the problem."

S. D. Goodman, Gen. Mgr., Royal Eastern Electrical Supply Co., Inc.—"I welcome this activity as a means of increasing listener interest. It will stimulate radio sales."

NBC and CBS to Broadcast Special Programs Urging Set Rejuvenation

From authoritative sources comes the news that both National Broadcasting Company and Columbia Broadcasting System definitely plan to aid the cause of quality radio reception through special programs during the month of March.

Beginning March 6, and continuing for approximately two weeks, National Broadcasting Company will announce daily over a national network, during a popular sustaining program, that if listeners are to obtain real pleasure from the \$1,000,000 weekly radio show, they should renew worn-out tubes, check their antennas, and otherwise spruce up their sets.

Columbia Broadcasting System, it is known, will make a similar effort to induce set owners to get the real benefit from their sets.

This timely action by the two major chains, in addition to the effective radio demonstrations by O. H. Caldwell, editor of *Radio Retailing*, cannot but result in a greater appreciation on the part of the public of the advisability of keeping their sets in A-1 condition. It will mean increased sales of quality receivers and tubes.

Cunningham and RCA Radiotron dealers, due to a product of highest quality and to the equipment and advertising provided by the Almighty Dollar Sales Activity, will be in a peculiarly good position to capitalize these broadcasts. The dealer with a Parade-of-the-Stars Display will be sure to benefit.

Radiotron and Cunningham Geared for Drive to Spur Radio Listener Interest

RCA Radiotron Company, Inc. and E. T. Cunningham, Inc., on March 1 launched what is said to be the most comprehensive and thoroughly planned campaign to spur radio set and tube sales ever ventured by a tube concern.

The sales offensive is aptly termed the "Almighty Dollar Sales Activity", being based on the remarkable purchasing power of today's "Almighty Dollar", and keyed to the million dollars' worth of radio entertainment that the set owner's dollar can buy today.

The Radiotron and Cunningham organizations are backing their plans with a \$200,000 advertising and merchandising program.

Millions of Sets Need Tuning Up

Officials of the sponsoring companies state that literally millions of radio sets are used but a relatively short time each day because worn-out tubes prevent well-intentioned set owners from appreciating today's improved programs. The Almighty Dollar Sales Activity is designed to remedy this by skillfully plugging, in advertising and displays, the great names of stage, screen and radio who are heard over the ether.

Intensive effort on the campaign will be applied from March 1 to May 1. Dealers are referred to their distributors for information regarding participation terms.



The Great Parade-of-the-Stars Display. The Cunningham Display is similar in most respects.

(Advertisement)

Radio Retailing, March, 1933

TUBE LEADERSHIP CEMENTED

17 New Types Round Out Radiotron-Cunningham Lines

Continuing the policy of making available to the trade a complete line of tube types, the RCA Radiotron Co., Inc., and E. T. Cunningham, Inc., have announced since Jan. 1, 1933, seventeen new tube types—42, 43, 25Z5, 44, 2A3, 2A5, 5Z3, 84, 1, 49, 77, 78, 2A7, 6A7, 2B7, 6B7 and 75.

With these seventeen new tube types the radio set engineer has at his command a tube designed for each particular service. This gives him free play in the use of his talents to design the best possible receiver. The retail dealer has available a complete line of tubes for initial equipment and renewal installation in all leading makes of radio sets.

A brief description of these new RCA Radiotrons and Cunningham Radio Tubes follows:



New Types Listed

42—A power amplifier pentode with 6.3 v. heater for the audio output stage of a-c. sets.

43—A power amplifier pentode with 25 v. heater especially suited for universal sets.

25Z5—A rectifier and voltage doubler with 25 v. heater for use in universal radio receivers of the a.-c., d.-c. type.

44—A super-control r.-f. amplifier pentode with 6.3 v. heater for a.c., d.-c. and automobile radio receivers.

2A3—Power amplifier triode with 2.5 v. filament for a.-c. operated receivers.

2A5—Power amplifier pentode with 2.5 v. heater for a.-c. operated receivers.

5Z3—A heavy-duty full-wave rectifier with 5.0 v. filament.

84—A high-vacuum, full-wave rectifier with 6.3 v. heater for automobile receivers.

1—A half-wave, mercury-vapor rectifier with 6.3 v. heater for automobile receivers.

49—A dual-grid power-output tube with 2.0 v. filament for battery operated receivers.

77—An r.-f. amplifier pentode or detector with 6.3 v. heater for a.-c. receivers.

78—A super-control r.-f. amplifier pentode with 6.3 v. heater for a.-c. receivers.

2A7—Pentagrid converter with 2.5 v. heater for a.-c. operated receivers.

6A7—Similar to 2A7 except that it employs a 6.3 v. heater and is intended for a.-c., d.-c. and automobile radio receivers.

Duplex-diode Pentode

2B7—Duplex-diode pentode with 2.5 v. heater for a.-c. operated receivers.

6B7—Similar to 2B7 except that it employs a 6.3 v. heater and is intended for a.-c., d.-c. and automobile radio receivers.

75—Duplex-diode high-mu triode with 6.3 v. heater for a.-c., d.-c. and automobile receivers.

"WHY ALL THE NEW TYPES OF TUBES?"

By E. T. CUNNINGHAM

President, RCA Radiotron Company, Inc.

"Why all the new types of tubes?" is a question that is being frequently asked these days.

The answer is largely to be found in present economic conditions. First we must have clearly in mind that an engineer in designing a radio set is limited by the capabilities and design features of the tubes available to him. Ten years ago radio circuits were relatively simple and somewhat crude. Many types of tubes were used for different purposes and no attempt was made to specialize in the type of tube for the particular circuit function. With the development of the super-heterodyne circuit and the refinement in detector circuits, automatic volume control circuits, etc., the need for specialized types of tubes for each type of service in a given circuit became apparent.

More Efficiency Per Stage

The first development was toward special output tubes. The characteristics of a good intermediate audio frequency amplifier tube were not those of a good radio frequency amplifier tube. By the use of specialized tubes greater and more efficient performance could be obtained in each stage in a radio receiver and quite frequently with a reduction either in the cost or bulk of the receiver.

In addition to the various functions which a radio tube must perform, such as rectification, detection, oscillation, and radio frequency and audio frequency amplification, the market for radio receivers divides itself into various classes which require special tubes. Originally there was a 1.1 volt line of tubes for battery operation, also a line of 3.3 volt tubes for battery operation. The old storage battery field required 5 volt tubes and with the develop-

ment of the air-cell type of battery 2 volt tubes became necessary. The alternating current market has used principally a 2.5 volt filament tube. The automobile receiver market required a 6.3 volt tube. And the filament voltages for use in the 110 volt D.C. market, for the most efficient type of receiver in that market, required still another voltage.

The great number of types are therefore partly due to the distinct markets for radio sets determined by the source of primary power available. The further increase in types of tubes comes about from the specialization in tubes to meet the needs of the designing engineer.

Natural Competitive Condition

This multiplication of types has resulted in many unnecessary types which are only minor variants from previous types. But that is probably a natural condition resulting from the intensive competitive struggle. Dealer inventory problems have been rendered more difficult as a result of the increased number of types and the reduced demand per type is resulting in higher costs of production which will continue to be reflected in higher selling prices for tubes than would be necessary with fewer types.

Out of all this forced development will come better radio receivers and undoubtedly a better balance between receiver design and tube design. At the present time the pendulum is throwing too much of the design burden on new types of tubes, resulting in an economic disadvantage for the radio market as a whole.

Real Advertising

Quick facts about advertising during the Almighty Dollar Sales Activity—Bipley-style copy in 195 newspapers—12 insertions—total circulation 264 million. 12 ads in Liberty, Collier's, Literary Digest and Post—total circulation of these weeklies, 8,300,000.

SERVICE FORMS IN CONSTANT DEMAND

THE RADIO SHOP
44 WALL STREET
HONOLULU, HAWAII

NAME: _____
ADDRESS: _____
CITY: _____ STATE: _____

DATE: _____

Model: _____

Complete: _____

DESCRIPTION	QUANTITY	PRICE	TOTAL
2A3			
2A5			
5Z3			
84			
1			
49			
77			
78			
2A7			
6A7			
2B7			
6B7			
75			
TOTAL			

THE RADIO SHOP
44 WALL STREET
HONOLULU, HAWAII

THE RADIO SHOP
44 WALL STREET
HONOLULU, HAWAII

NAME: _____
ADDRESS: _____
CITY: _____ STATE: _____

DATE: _____

Model: _____

Complete: _____

THE RADIO SHOP
44 WALL STREET
HONOLULU, HAWAII

THE RADIO SHOP
44 WALL STREET
HONOLULU, HAWAII

NAME: _____
ADDRESS: _____
CITY: _____ STATE: _____

DATE: _____

Model: _____

Complete: _____

THE RADIO SHOP
44 WALL STREET
HONOLULU, HAWAII

First offered to dealers last Fall, the simplified service bookkeeping forms designed by E. T. Cunningham, Inc., and RCA Radiotron Company, continue to be the objects of an enormous and apparently inexhaustible demand.

Outstanding in popularity among these system aids are the three convenient and inexpensive forms shown herewith.

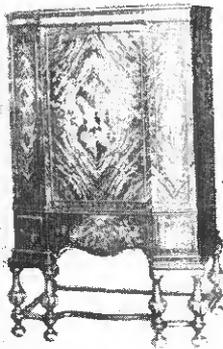
Combining the best features of forms used by leading dealers, the Service Order Form offers the service department a simple, complete and compact method of making charges and recording service work done. Radiotron Item No. 319. Cun-

ningham Form No. 1180. Price, imprinted, 3 triplicate pads (50 sets to a pad) \$1.25.

A neat and attractive Service Billhead does more than satisfy the pride of the sender. It actually aids business, encourages prompt payment of bills. Radiotron Item No. 318. Cunningham Form No. 1178. Price, \$1.00 for 500, with imprint.

The Not-at-Home Card is a courteous method of informing the customer that the service man has kept his appointment—and that the next move is up to the customer. Radiotron Item No. 317. Cunningham Form No. 1179. Price per 100, imprinted, \$0.25. Minimum order, 100.

NEW MERCHANDISE



Stromberg-Carlson Model 43

Stromberg Carlson Sets

All four of the Stromberg-Carlson's new models (Stromberg-Carlson Telephone & Manufacturing Co., Rochester, N. Y.) utilize an audio output system with a new type of tube. One of these new tubes is the No. 5Z3, a heavy duty rectifier that does the work of two No. 80's. The other is the 2A3, a super-triode output tube that contains 30 inches of filament and whose electronic emission is many times greater than its predecessors. A new type of speaker had to be designed to take care of the tremendous undistorted power of the tube.

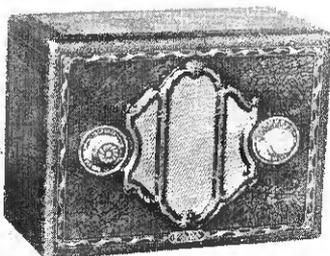
The seven features claimed for these new sets as a result of the new design are: higher undistorted volume; ample reserve power output, longer audio frequency range, low level tone compensation, adjustable acoustic compensation, greatly extended audio range for phonograph reproduction, and the fact that the new chassis audio output controls also serves phonograph system.

The new receivers are known as models 48, 49, 50 and 51. Models 48 and 49 are low boys; Model 50 is a high boy, and Model 51 a phonograph combination. All utilize an 11-tube superheterodyne circuit with a.v.c. and automatic muting circuit with silences, all extraneous noises while tuning.

As we go to press, a fifth set is announced, Model 43, illustrated. This receiver is powered by the No. 38 ten tube chassis and is housed in a half-octagonal shape cabinet.—*Radio Retailing*, March, 1933.

Fadalette

The "Fadalette" of the Fada Radio & Electric Corp., Long Island City, N. Y., comes in an embossed leatherette case available in four color combinations (Spanish brown, deep green, ivory and dark red). Gold trimming is applied to the four basic colors. The set weighs 6½ lb. and may be used on a.c. or d.c. It has four tubes, dynamic speaker, and lists for \$25.—*Radio Retailing*, March, 1933.



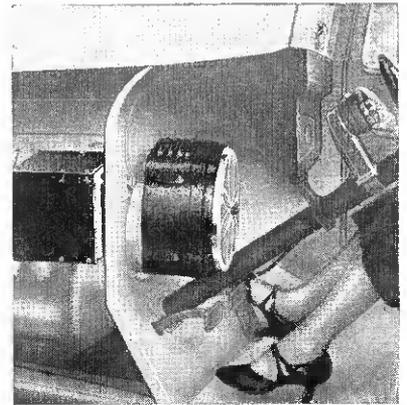
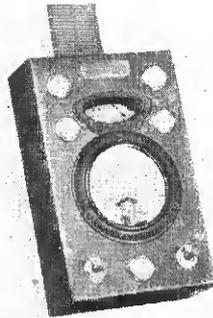
Capehart Aladdin Remote Control

Full and complete control of both the phonograph and the radio, from any number of remote locations, is obtained with the Capehart "Aladdin" control of the Capehart Corp., Fort Wayne, Ind.

The control station enables the operator to tune the radio to any station; turn current off and on at each control station, speaker and instrument; turn off or on each individual speaker; increase or decrease volume for all speakers; switch from phonograph to radio or vice versa, and reject any record.

The kilocycle meter on each control station enables one to tune into any radio station desired and to know what wave length and station the set is tuned into.

Three remote stations and three speakers can be used with standard instruments. Special models available to operate any required number of remote stations and speakers.—*Radio Retailing*, March, 1933.



Arvin Car Radio

The manufacturer of Arvin hot water car heaters, Noblitt-Sparks Industries, Inc., Columbus, Ind., has introduced the Arvin auto-radio set in two models—6 and 7 tube all-electric superheterodynes, both at popular prices.

The variable unit mounting idea which the Arvin engineers have developed adds to the ease of installation on all cars. Because of the simplicity of construction it takes but a few minutes to open up the entire radio for inspection or service. Instead of the usual small knob for the tuning, this set's tuning control fits the entire hand. It clamps on the steering column right in the line of vision.—*Radio Retailing*, March, 1933.

Tropic-Aire Auto Radios

Three new automobile radios are being introduced to the trade by Tropic-Aire, Inc., 60 Eleventh Avenue, N.E., Minneapolis, Minn. This company manufactures the well-known Tropic-Aire water heaters for motor cars. These sets will be known by the same trade names as the company's three heater models, that is, Senior, Junior and Universal. All are 6 tube all-electric superhets.

The Universal, one-piece unit, is \$44.

The Junior, two-piece unit with "B" battery eliminator embodied in the speaker is \$59.50.

The Senior, three-piece unit with "B" battery eliminator embodied in the speaker and remote control mounted on the steering column, is \$74.95.—*Radio Retailing*, March, 1933.

RCI Line

A 5-tube a.c.-d.c. receiver using a 25Z5, 43, 2—39, 36, with a switching arrangement wherein the 25Z5 is used as a voltage doubler may be obtained from Radio Chassis, Inc., 112 West 18th St., New York City. The speaker is a Rola dynamic.

A low priced short-wave broadcast receiver is about ready for production. It will receive from 15 to 550 meters with three switching positions. A long wave receiver capable of receiving from 800 to 2100 meter is also offered. It is planned to mount both chassis in one cabinet, making a practical all-wave receiver.

A working model of a new circuit design, 11 tube receiver incorporating "Class A prime amplification," noise elimination between stations, a.v.c. and automatic tone control is now ready and production should begin on this model in the near future.

The line will also include a 4 tube a.c.-d.c. receiver for price competition purposes using a 25Z5, 36, 43, and 39.—*Radio Retailing*, March, 1933.

Stewart Warner Companion Sets

The preference of many people for things which are not what they seem, impelled the Stewart-Warner Radio Corp., Diversy Blvd., Chicago, to design a receiver resembling a pair of books, size is 9½x7¼x4½ in. They come in seven editions.

The set embodies the latest tube equipment—a 36, a 33, a 39 and a 12Z3 rectifier. It operates on a.c. or d.c. and a "heat take-off" plug-in cord furnishes the resistance necessary to keep heat out of the set. The adaptor cords may also be used for operation on 6, 12 and 32-volt d.c. as well as 220-volt current. The retail price ranges, according to book binding, from \$26.50 up.

Stewart-Warner also makes a small metal midget in bronze, gold or silver. It can be used on all currents and has the same tube equipment as the book model. As in the book model, police calls in addition to regular programs can be brought in. \$24.50.—*Radio Retailing*, March, 1933.

Emerson Sets

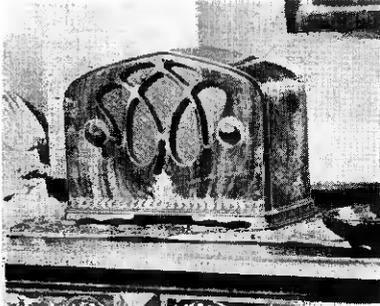
In addition to its original Model 25-A Compact a.c.-d.c. set, the Emerson Radio & Phonograph Mfg. Co., 641 Sixth Ave., New York City, has added four new numbers to its line.

Model 250 is of especially attractive design—modified Gothic (illustrated). It is a five-tube superheterodyne with dynamic speaker using 2-78, 77, 43 and 25Z5. \$25.

Model 35 is a six-tube super in an upright table cabinet. Tubes used 1-43, 1-25Z5, 1-77, 2-78, and 85. The set has a.v.c. and lists at \$32.50.

Model 300 is a chest type set with the same tube line-up as model 250. List, \$30.

Model 20-A in a bakelite case measures 9½x6½x4½ in., \$17.95. It is a four-tube set. Zipper carrying case \$2 additional.—*Radio Retailing*, March, 1933.



Emerson Model 250

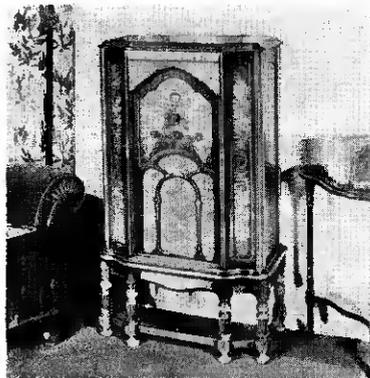
Crosley Sets

Rounding out its line the Crosley Radio Corp., Cincinnati, Ohio, announces the "Twelve," a 12-tube superheterodyne available in a table or lowboy cabinet, retailing at \$49.99 and \$59.99; and the "Leader," a compact 4-tube table model priced at \$14.99.

The "Twelve" has manual static control, a.v.c., new 2½ volt heater type tubes and continuous tone control.

Crosley's new all-electric superhet auto-radio retailing at \$49.95, completely installed, has "Synchronode" power unit to eliminate B batteries, quiet a.v.c., and uses the following tubes: 77, 2-78, 75, 89. The unit is shipped complete with eight spark-plug noise suppressors, one distributor head suppressor and two condensers.

The Synchronode "B" supply unit is said to eliminate entirely the objectionable sparking at contact points. The unit derives its name from the fact that the vibrator is so controlled electrically that its action is perfectly synchronized with the voltage interruptions. It has no tubes, bearings, brushes or other high speed rotating parts.—*Radio Retailing*, March, 1933.



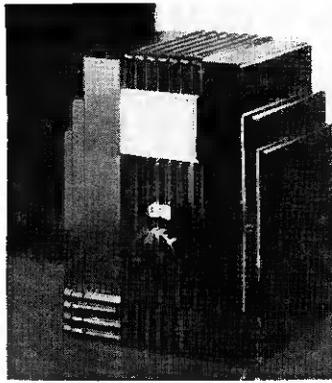
Crosley "Twelve" Lowboy

IRC Resistors

The laboratory of the International Resistance Co., Philadelphia, Pa., announces new manufacturing processes which have resulted in many refinements giving IRC resistors new low contact between resistance element and terminals.

IRC has also substantially reduced prices on its metallized and power wire wound resistors and kits, effective March 15.—*Radio Retailing*, March, 1933.

Radio Retailing, March, 1933

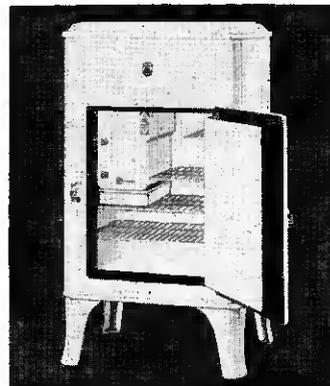


Air King Clock Radio

A most striking midget radio designed along ultra-modern lines can be obtained from the Air King Products Company, Inc., 27 Hooper St., Brooklyn, N. Y.

The cabinet is a moulded job, made out of a urea material and may be had in every color of the rainbow as well as black with contrasting colors in the clock and bezel.

The set is a 5-tube superheterodyne using a combined detector oscillator and one intermediate frequency stage, with a two-gang condenser using 456 intermediate frequency. Tubes used are 2-57, 1-58, 1-247 and 280. Speaker is a dynamic and the electric clock on the panel is of a synchronous type. Provision for starting and setting are on the back. This set measures 9½ in. wide by 12 in. high, by 7½ in. deep, and lists at \$34.50.—*Radio Retailing*, March, 1933.



Majestic Electro-Sealed Refrigerators

An electro-sealed motor and compressor is featured in the de luxe model refrigerators of the Grigsby-Grunow Co., 5801 Dickens Ave., Chicago. As the phrase implies, the two vital parts of the refrigerator are electro-sealed—and for safety within a solid steel dome. Other features of the de luxe models are a "Stay-Kold Defroster," which keeps ice cubes intact during the defrosting period; an auto-reset protector which precludes the possibility of discontinued refrigeration due to a temporarily reduced voltage; Triple-Type insulation and "Stay-Brite" finish.

The models range from the Century No. 450 with a food capacity of 10.7 sq.ft. making 42 ice cubes to a de luxe model 1400 with a food storage area of 23.25 sq.ft. making 170 cubes.—*Radio Retailing*, March, 1933.

Cartridge Condenser Kit

Tilton Mfg. Co., 15 E. 26th St., New York City, has a brand new kit of cartridge type condensers, packed in a rugged box especially for use as replacements units by servicemen. The kit contains 20 condensers of 6 popular values—.01, .02, .05, .1, .25 and .5 microfarads. These are conservatively rated at 400 volts.—*Radio Retailing*, March, 1932.

Clarion "Leisurette"

A two-piece radio—control cabinet and speaker cabinet—is presented by the Transformer Corp. of America, Ogden and Keeler Aves., Chicago.

The chassis control table is styled after a "Queen Anne" end table and houses the radio chassis which incorporates Class B amplification, tuning indicator, delayed automatic volume control, variable noise level control and uses 14 tubes.

The separate speaker cabinet houses two 10 dynamic speakers. The list price, complete, is \$100.

TCA also offers Model 400 a.c.-d.c. table set, technical data on which is not available at this time.—*Radio Retailing*, March, 1933.



Clarion "Leisurette"

Mallory Elkon "B" Eliminator

The new Elkon "B" eliminator of P. R. Mallory & Co., Inc., Indianapolis, Ind., is designed around the Elkon self-rectifying "Elkonode." No rectifying tube is employed, rectification of the high-voltage output being accomplished within the Elkonode by a reed that vibrates in exact synchronism with the interrupter reed, much like the two prongs of an ordinary tuning fork. A single magnet supplies the motive power, and sparkless operation is achieved. The size is 2½x2½x5½ in.

Models have been designed for many arrangements of outputs as well as for operation from 12 volt and 32 volt systems.—*Radio Retailing*, March, 1933.

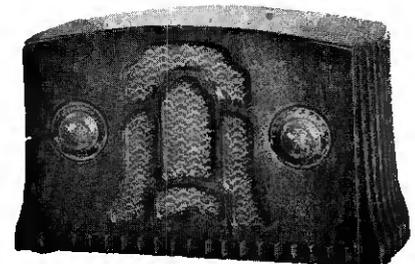
New Cleanaire Price

Through an error on the catalog sheet, the price of the "Cleanaire" of the Ohio Carbon Co., Cleveland, Ohio, was given as 50c. The correct price is 60c.—*Radio Retailing*, March, 1933.

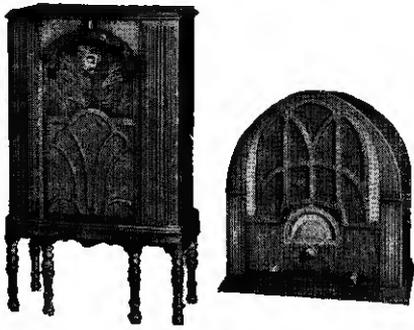
GE Sets

An a.c.-d.c. set, Lilliputian in size, known as the Model K-40, has been added to the line of the General Electric Co., Bridgeport, Conn.

GE's "Color-Radio" features a new idea—associating color with music. By means of an ingenious arrangement on the panel the listener has a double check on tone, both eyes and ears being utilized to tune in to the best point. The set, a console, also has visible tuning control with a needle shadow on the graduated dial indicating the proper tuning point. Other features are dual a.v.c., tone equalizer, 10 tube superheterodyne circuit including three newly developed Triodes and two new heater type output tubes.—*Radio Retailing*, March, 1933.



GE Model K-40



U. S. Gloritone Models 3040 and 3072

U. S. Radio-Gloritone Models

Four new sets have been added to the line of the U. S. Radio and Television Corp., Marion, Ind., to be known as the U. S. Radio-Gloritone models. These are in addition to the regular line of U. S. Radio-Apex models.

Model 3056 is a five-tube superheterodyne in a Cathedral style, table type cabinet. Tube equipment: 2-57, 58, 47, 80. \$19.95.

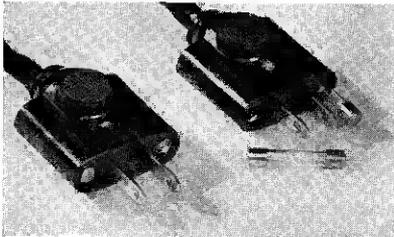
Model 3040 is a full size console with the same chassis. \$29.95.

Model 3072 is a seven-tube superheterodyne in a table cabinet. It has a.v.c. and tone control and uses 3-58, 47, 80, 55, 56. \$29.95.

Model 3074 employs the same chassis and lists at \$39.95.—*Radio Retailing*, March, 1933.

Philco Three Purpose Antenna System

The primary purpose of the Philco system is the reduction and elimination of noise pick up in the lead-in wire. The second is increased efficiency of reception, and the third is to provide operation of from two to four radio stations on a single antenna. It is said that this system is comparatively easy to install and that the average service man can do the entire job. Philco Radio & Television Co., Philadelphia, Pa.—*Radio Retailing*, March, 1933.



Fused Plug

The fused attachment plug offered by Lee Skipwith & Co., 369 Lexington Ave., New York City, is available to radio set manufacturers as a device for fusing and protecting the radio at but a few cents over and above the cost of an ordinary attachment plug.

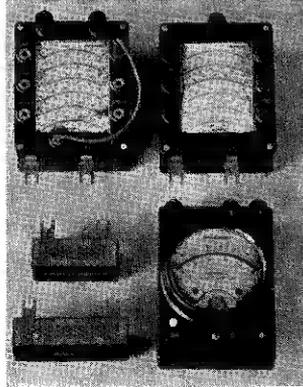
For dealers and servicemen it is available in a counter display carton. Lists at 25c. including two fuses. Fuse refills are four for 10c. Cased in Bakelite.—*Radio Retailing*, March, 1933.

Shure Radio Modulator

The radio modulator of Shure Brothers Co., 337 W. Madison St., Chicago, employs a modulated oscillator circuit. It is thoroughly shielded and carefully designed to prevent radiation. A 2-button microphone of the professional type is used. When used with a modern set with good tone quality and enormous reserve of power, the combination makes a satisfactory public address system. The list price is \$33.50, complete with three tubes, microphone, and 50 ft. of cable.—*Radio Retailing*, March, 1933.

Morrill Precision Multi-Purpose Meter

A precision a.c. and d.c. instrument measuring microamperes, milliamperes, millivolts, amperes and volts and d.c. resistance can be obtained from Morrill & Morrill, 30 Church St., New York City. It is ideal for research and development laboratories, universities and testing work in the field. D.C. ranges: 20 microamps. to 250 amps., 1 millivolt to 2000 volts and 5 ohms to 50 megohms. A.C. ranges: 0.1 milliamp. to 10 amps., 0.5 volt to 1000 volts.—*Radio Retailing*, March, 1933.



Stewart Auto Radio

"Floating" tone control is incorporated in the "Companion" all-electric superheterodyne auto radio of the Stewart Radio and Television Co., 40 W. Milwaukee Ave., Detroit, Mich.

The speaker-eliminator combination unit is arranged on a heavy hinge so the car owner may adjust the speaker loading to suit his own ear, providing "floating tone control."

The set uses 2-39, 36, 85, 41 and 84. It has a.v.c. The superdynamic speaker and electric "B" supply are one unit. List price ready to install, \$44.50.

The Aristocrat, a 7 tube model, lists at \$59.50.—*Radio Retailing*, March, 1933.

Falck Auto-Radio and "B" Power Unit

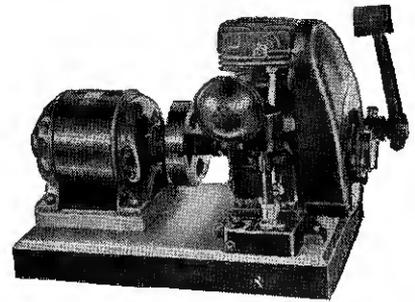
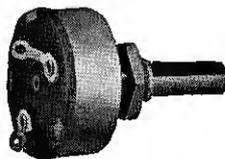
Advance Electric Co., Inc., 1260 W. Second St., Los Angeles, Calif., is making an auto-radio using the latest type tubes, a.v.c., and Magnavox dynamic speaker. A four wire plug completes all connections necessary to the set.

This company also makes an auto "B" power unit listing at \$13.95. It has no rotating parts—a highly developed vibrating contactor is used in conjunction with a mercury rectifying tube. The entire electrical unit and filter are mounted on the lid of the container and may be removed for inspection by two thumb nuts. The auto-radio set above may be had with this eliminator if desired.

An automatic A power control relay to control the "B" power unit from the present radio switch can be supplied for \$1.50.—*Radio Retailing*, March, 1933.

Wirt Rotary Snap Switch

A single pole, single throw, rotary snap switch, rated at 3 amp. at 125 volts, is being made by the Wirt Co., 5221 Greene St., Germantown, Philadelphia, Pa. It is known as No. 711, and the announcement says that this switch has smooth, positive action and perfect contact with minimum contact resistance after severest tests. Simplicity of working parts and ease of mounting make this switch especially applicable for radio receiver assembly.—*Radio Retailing*, March, 1933.



Kato Midget AC Plant

A convenient source of standard a.c. on sound trucks or in isolated places is provided by the new midget a.c. plant of the Kato Engineering Co., Mankato, Minn. It generates 110 volts, 60 cycle, a.c. 300 watts capacity. It will handle twelve 25 watt lamps, one quarter hp. motor, a.c. radio, and makes possible the use of standard a.c. appliances, making it suitable for summer homes and small farms.

This plant consists of 4 cycle air-cooled engines equipped with magneto direct connected to an alternating current generator. List price, \$140.

Larger sizes can be had such as 1,000, 1,500, 2,000 and 3,500 watt.—*Radio Retailing*, March, 1933.

Fordson Midget

Among the features claimed for the six-tube superheterodyne midget of the Fordson Radio Mfg. Corp., Detroit, Mich., are a.v.c. using the new duplex diode triode tube, superheterodyne design using an intermediate frequency of 456 kilocycles, tone control, traveling spotlight tuning dial and a speaker of new and different design. The set, which will be sold under the trade name "Goldentone," has gold lacquered chassis.—*Radio Retailing*, March, 1933.

Glaser Auto Radio

Three 57, two 37 and push pull 89's in the output stage make up the tube equipment of the all-electric auto radio set of Glaser's Auto Radio Corp., 5115 S. Kedzie Ave., Chicago.

The overall dimensions are 7½x10½x6 in. The chassis slides in or out of the case at will. This set has Utah remote control and 8 in. dynamic speaker.—*Radio Retailing*, March, 1933.



Globar Spark Suppressor

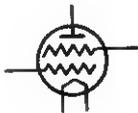
Permanency of contact between the resistor and the terminals is claimed for the auto-radio spark suppressor of the Globar Corp., Niagara Falls, N. Y. This suppressor can be obtained in three types: spark plug, distributor and splice-in.—*Radio Retailing*, March, 1933.

Universal Products

Among the new things announced by the Universal Microphone Co., Inglewood, Cal., are a "4 to 1" unit power supply (voice or C.W.) for short wave transmitters, designed specially for the new '47 tube crystal controlled transmitter; pregrooved or ungrooved aluminum discs for home recording in double faced style, four, eight, ten and twelve inch sizes; a tone control for use with p.a. installations and a Hand-Mike stand for either the one or two-button types.

Also a bullet condenser type microphone; a remote control panel, and two new input stages.—*Radio Retailing*, March, 1933.

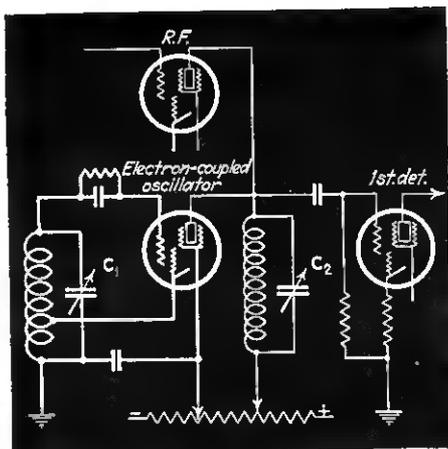
SERVICE AND INSTALLATION SECTION



CIRCUITS of the MONTH

Electron-Coupled Oscillator

OUT of the experimental laboratory into commercial equipment graduates the electron-coupled oscillator. (Not to be confused with "electronic" oscillators or "Dynatron" oscillators.) This month finds it in use in three new devices: McMurdo Silver's "Ham" super and Weston and Clough-Brengle test oscillators.



Briefly, an electron-coupled oscillator is one in which the load is coupled to the generator by a flow of electrons rather than by inductive, conductive or capacitive methods. The result is an oscillator whose tuned circuit, hence operating frequency, is less affected by changes in load characteristics.

Silver uses an ordinary r.f. pentode with the screen performing the normal function of a plate in a triode oscillatory circuit while the plate serves solely as a coupling medium between the generator and first detector. A common oscillatory circuit will be recognized in the heavy lines of the diagram if the screen is thought of as a plate. Variation of C_1 tunes the oscillator while C_2 simply tunes the load, or "work" circuit, to resonance, permitting power

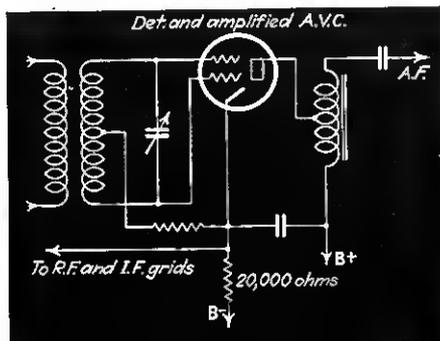
transfer to the detector input. Variations in the load circuit are not reflected into the oscillatory to influence tracking due to electrical isolation. Grounding of the screen through a fixed capacity further limits such inter-action.

Special tubes having four grids, a plate and an indirectly heated cathode are in preparation, we hear. These will permit the combination of an oscillator, electron-coupled to a first-detector all in the one tube. The new bottles will probably have seven prongs and cap connection in both 2.5 and 6.3 volt types.

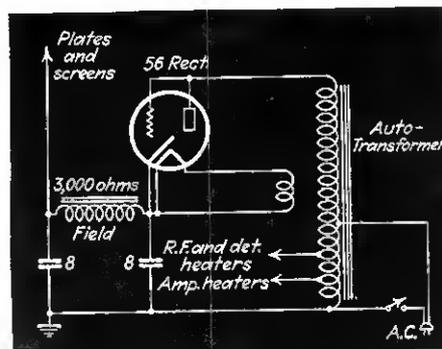
Amplified A.V.C.

Predicted last month (RR36Feb) amplified automatic volume control, affecting sensitivity less when receiving weak signals but exerting greater control over the strong, is about to become fact. One of the larger receiver manufacturers is ready for production with a circuit designed around a Wunderlich tube and sets using other types are momentarily expected.

Full-wave detection is accomplished in the usual manner between grids and cathode but a.v.c. voltage, usually secured from the drop in rectified signal voltage across the grid-leak, is obtained instead



from a 20,000 ohm resistor in the cathode circuit. The triode portion of the tube is utilized primarily as an a.v.c. rectifier rather than for its a.f. gain and where the usual detector—a.v.c.—1st a.f. tube provides only rectified signal voltage for bias control the system diagrammed supplies control voltage first amplified by the triode portion.



Auto-Transformer

Unique use of the auto-transformer principle is incorporated in Belmont's new Model 400. 175 volts d.c. (at the divider) for plates and screens is obtained via a tapped inductance and half-wave rectification. A second tap supplies 12.6 volts to a 39 and 36 connected in series while a third furnishes 6.3 volts at 0.4 amps. for a 41 amplifier. A secondary winding operates the 2.5 volt rectifier heater.

Sub-Antenna

In several a.c. midgets a length of flexible wire having one end connected to the "innards" and the other free will be found

Electrolytic Condensers

How to measure a. c. resistance, ripple, surge and working-voltage, capacity, leakage. Permissible values

By R. O. LEWIS

Condenser Engineer,
P. R. Mallory & Co.

IN ORDER to select the proper electrolytic condenser for use in any circuit, certain things must be known about the circuit.

1. The capacity of the condenser necessary. (a) The capacity of the first condenser in the filter determines the voltage output of the power supply and also the amount of hum in the output. (b) The second condenser in the filter is instrumental in determining the amount of hum in the output and in case there are only two condensers in the filter, this condenser also determines to a large degree the tendency of the audio amplifier to motor-boat or oscillate. Also, the receiver may oscillate at radio or intermediate frequencies if the last condenser in the filter has too high an impedance at these frequencies. (c) When used as a by-pass condenser in any part of the circuit, the capacity must be correct to maintain minimum tendency to oscillate at proper volume output as well as tone quality.

2. In any type of service the normal working voltage appearing on a condenser in the circuit must be known.

3. The peak a.c. ripple in the first filter condenser should be known.

4. The surge voltage which will appear on the condenser when tubes are removed or burned out should be known.

These values—working voltage, peak a.c. ripple voltage and peak surge voltage rating—as well as the capacity, should appear on any order for replacement condensers for use in a filter circuit. For by-pass service, the peak surge voltage is usually all that is necessary unless the condenser is subjected to unusual conditions. One of these conditions arises in a circuit which requires a low radio or intermediate frequency impedance* in the by-pass condenser, or filter output condenser, in order to maintain stability in the receiver.

In case high temperatures are encoun-

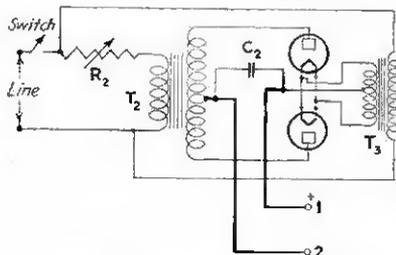


Fig. 1—Variable Voltage Supply

tered, or very low temperatures as in automobile service, this fact must also be considered.

The equipment best adapted to measurement of condensers and circuit conditions affecting condensers is as follows:

1. A variable voltage supply capable of adjustment from zero to at least 600 volts d.c.
2. A potentiometer arrangement for measurement of voltage without drawing current from the apparatus being measured.
3. A peak reading voltmeter for meas-

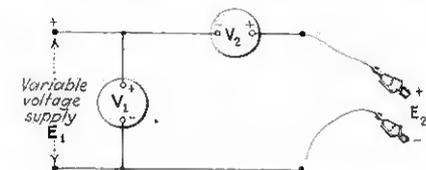


Fig. 2—Voltage-Measuring Potentiometer

urement of a.c. voltages superimposed on the d.c. voltage applied to filter condensers.

4. A simple bridge circuit for measurement of capacity and a.c. resistance of a condenser. A circuit diagram with a brief description of each of these devices follows:

Variable Voltage Supply

This type of apparatus is so well known that little need be said about it.

T_2 , Fig. 1, is a power transformer wound with a 110 volt primary and a center-tapped secondary, each half wound for 475 volts a.c. R_2 is a line voltage control resistor. C_2 is a waxed-paper condenser rated at 700 volts and 4 microfarads. The tubes are Type 81. The voltage on the filaments, supplied by transformer T_3 , does not vary with the adjustment of R_2 . Transformer T_3 is wound for 110 volt primary and 7.5 volt secondary at 2.5 amperes.

Potentiometer

The potentiometer is a device for measuring an unknown voltage without drawing current from the unknown voltage source.

In Fig. 2 is shown the circuit diagram consisting of two voltmeters V_1 and V_2 connected as shown, with connections for a variable voltage supply and clips on a pair of leads for connection to the unknown voltage which it is desired to measure.

The operation consists of placing the clip leads across the unknown voltage, and con-

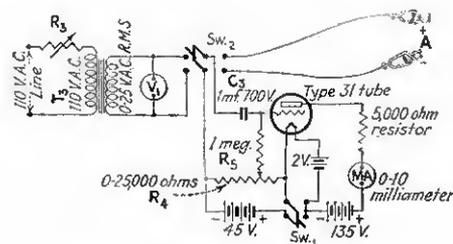


Fig. 3—Peak-Reading Voltmeter

necting the variable voltage supply to marked terminals, keeping the polarity as shown in both cases. The variable voltage supply should be adjusted for zero voltage when connected.

Both voltmeters will read some value of voltage when the clips are connected across an unknown voltage source but as the variable voltage E_1 is increased V_1 reads higher and higher and V_2 reads lower and lower until V_2 reads zero volts. At this point E_1 is equal to the unknown voltage E_2 and is read on voltmeter V_1 . If the variable voltage E_1 is adjusted to higher voltages than the unknown voltage E_2 , the voltmeter V_2 goes off scale below zero. When V_2 reads zero, there is no voltage difference between E_1 and E_2 and no current is drawn from the unknown voltage. This method is therefore the best method of measuring voltages across sections of a high resistance voltage divider as it appears on a condenser used as a by-pass condenser.

Peak Reading Voltmeter

As shown in Fig. 3, a peak reading voltmeter is a vacuum tube voltmeter.

When the double pole single throw switch Sw_1 is closed the apparatus is ready for operation. Sw_2 is opened and by means of the C bias control R_4 the plate current is adjusted to about 1 milliamperes. The clips A are placed across a filter condenser in a receiver which is operating and the switch Sw_2 is closed on the clip lead side. With this connection the condenser C_3 blocks out the d.c. voltage from the receiver but allows the a.c. ripple voltage to produce an a.c. voltage across resistor R_5 which is connected across from grid to filament of the tube. The a.c. voltage across R_5 causes the tube plate current to rise to a value depending on the value of the a.c. voltage on the grid. This plate current is read on the milliammeter and recorded. The switch Sw_2 is then changed over to the transformer-voltmeter side and the a.c. voltage adjusted by means of R_3 until the milliammeter reads the same as it did when the ripple voltage was impressed on the vacuum tube grid. The voltmeter V_1 reads the value of a.c. volts necessary to produce this amount of plate current in the tube and this voltage is therefore equal to the a.c. ripple voltage.

The a.c. voltmeter V_1 reads the Root-Mean-Square Voltage so in order to get the peak ripple voltage it is necessary to multiply the voltmeter reading by 1.4.

Article Number 1.

SELECTING REPLACEMENT PARTS

This is the first of a series prepared to help servicemen select repair parts for fitness and quality. *Fixed Resistors* will be discussed in an early issue.



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which is the ratio between the peak value of voltage and the r.m.s. voltage.

In Fig. 4 is shown a bridge circuit which can be built up mostly of parts which are usually found in any serviceman's equipment.

It is necessary to have a waxed-paper condenser C_2 , the capacity of which is known. Such a condenser can be obtained from any of the paper condenser manufacturers with the accurate value of capacity marked on it. The best standard would be an 8 mfd. condenser capable of standing up under the maximum voltage which will be used, about 700 volts d.c. The capacity does not have to be 8 mfd. exactly as long as the exact value is known. The blocking condenser C_3 is a 700 volt 1 or 2 mfd. waxed-paper condenser.

The rheostat R_3 has no off position. It must be calibrated in ohms by means of an ohmmeter or volt-ammeter method. It can be calibrated by putting a pointer on the shaft to indicate divisions marked on a scale placed on the panel. The scale can be divided into divisions representing ohms read on an ohmmeter as the pointer is rotated over the scale. A rough calibration can be made by dividing the distance travelled by the pointer over the scale into 10 equal parts. Each division will then be approximately 10 ohms if the total resistance of the rheostat is 100. This rheostat should be a wire-wound type with a uniform change of resistance with degree of rotation. The other 5 resistors of 100 ohms each are connected to a switching device, as shown, which cuts in 100-200-300-400 or 500 ohms in series with the 100-ohm variable resistor.

The potentiometer comprising R_1 and R_2 must be calibrated according to the ratio of R_2 to R_1 which is R_2 divided by R_1 . This can be done as follows:

Mount the potentiometer on a panel with a pointer dial which moves over a plane scale on the panel. Mark the points on the scale at each end where the pointer stops when rotated as far as it will go clockwise and counterclockwise. By means of an ohmmeter or the volt-ammeter system measure the total resistance of the potentiometer. Divide the total resistance by 6 and record the number of ohms resulting.

If the total resistance is 200 then $\frac{200}{6} = 33.3$ ohms and with $R_1 = 33.3$ ohms.

The ratio of

$$R_2 \text{ to } R_1 = \frac{R_2}{R_1} = \frac{200-33.3}{33.3} = 5.$$

When $R_1 = 33.3$ ohms is measured off by connecting the ohmmeter between the counterclockwise end of the potentiometer and the rotating arm connection and rotating the dial until the ohmmeter reads 33.3 ohms mark this pointed position with a 5 to indicate that the ratio $\frac{R_2}{R_1}$ is 5 at this point.

For a ratio $\frac{R_2}{R_1} = 4$, we divide the total

resistance 200 ohms of the potentiometer by 5 and $R_1 = 40$ ohms. This point can be calibrated in the same manner. In any case,

$$R_1 = \frac{\text{Total potentiometer resistance}}{\left(\frac{R_2}{R_1} \text{ plus } 1\right)}$$

For a ratio of $\frac{R_2}{R_1} = 1/2$, we divide the total

resistance of the potentiometer by $(1/2 \text{ plus } 1)$ or $1\frac{1}{2} = 1.5$ to find R_1 .

The same rule applies for all the ratios required on the scale.

For a rough calibration a length of travel of the pointer on the scale may be substituted for R_1 then the total length of the scale divided by the ratio plus 1 will give the length to lay off from the counter

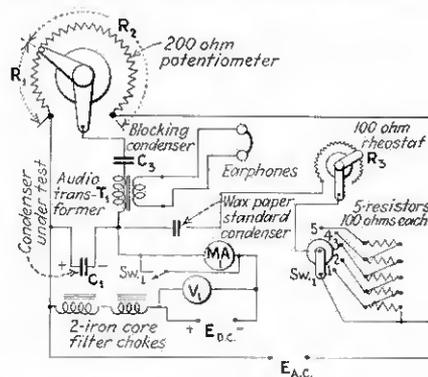


Fig. 4—Condenser Bridge Circuit

clockwise end of the scale to give the proper length to represent R_1 . Thus the scale can be laid off to represent the various ratios needed.

Fig. 5 illustrates a scale laid out in this manner.

After the scale is made the bridge can be completed. The unknown condenser should be connected in the proper polarity and the proper d.c. voltage applied to the bridge terminals. This voltage should be the working voltage rating of the condensers.

The leakage reading can be taken on the 0 to 10 milliamper meter MA after a 5-minute period with the voltage on, by opening the switch Sw_1 .

The a.c. voltage can then be applied to the bridge. A voltage source like the one used in the peak reading voltmeter can be used to supply about 10 volts a.c. to the terminals marked $E_{a.c.}$.

The capacity and a.c. resistance can then be measured by adjusting the potentiometer ratio and the resistance R_3 until minimum signal is heard in the ear phones. First one then the other should be adjusted until a change in either one causes an increase in the signal.

The capacity of the condenser under test is then the standard condenser capacity multiplied by the ratio as read on the potentiometer ratio scale.

The resistance will be the resistance as

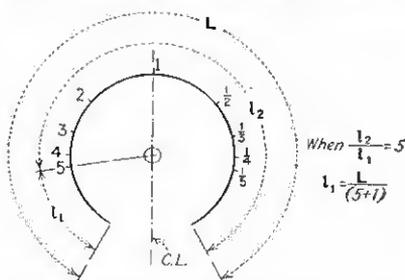


Fig. 5—Calibration of Potentiometer Ratio Scale

read on the rheostat plus the resistance of the fixed resistance network divided by the ratio as read on the ratio scale of the potentiometer.

If the ratio scale reads 2, the capacity of the unknown is twice the capacity of the standard and the a.c. resistance is $1/2$ the resistance in the rheostat and resistors.

Permissible Values

With the variable voltage supply any usual voltage is available for measurements. The potentiometer arrangement will make it possible to measure any d.c. voltage appearing on a condenser in the radio receiver without changing that voltage during measurement. Both the working voltage, when the receiver is operating normally and the peak surge voltage when some of the tubes are out of the sockets should be measured by this equipment.

With the peak reading voltmeter the peak ripple on the first filter condenser can be measured. If the peak ripple voltage is higher than 40 volts on a 60-cycle line a condenser of higher capacity should be used to reduce it to this value or below. This usually means replacing an old condenser with a new one which has not lost its capacity.

On a 25-cycle line the peak ripple should not exceed 60 volts if the condenser is to have its maximum life. When the peak reading voltmeter is used on 25 cycles it will be necessary to use an a.c. voltmeter V_1 in Fig. 3 with a 50-volt range.

On 25 cycles it is difficult to hear the signal in the phones when measuring capacity on the bridge. Connect the vacuum tube voltmeter across the phone terminals. When the bridge ratio arm and resistance is properly adjusted minimum signal will be indicated by minimum reading on the v.t. instrument's milliammeter.

The bridge method of measuring capacity and a.c. resistance of condensers is a convenient method of comparing condensers.

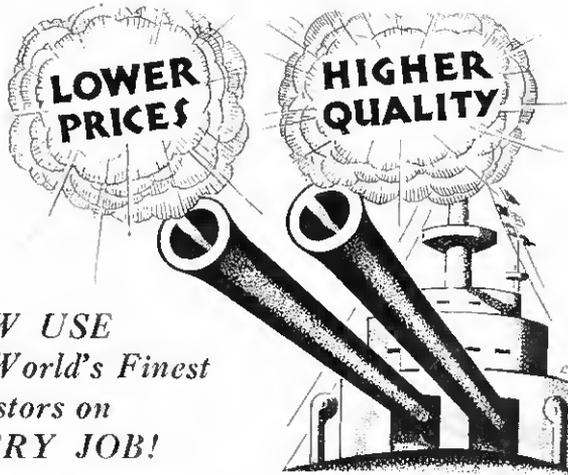
In the arrangement shown the condenser can be checked for leakage, capacity and a.c. resistance. The leakage in a normal condenser should not exceed .2 of a milliampere per mfd. after it has been on voltage at its rated working voltage for a period of from five to ten minutes. A 4 mfd. condenser can have $.2 \times 4 = .8$ mils leakage or an 8 mfd. $.2 \times 8 = 1.6$ mils, etc. No condenser will last long when the leakage remains at a value of over 5 m.a. when tested as above.

The ability of a condenser to stand the peak surge voltage which will be encountered in the circuit, can be determined by applying the peak surge voltage to the condenser for a period of 5 minutes and then dropping the voltage to the rated working voltage and observing how soon the condenser comes back to normal leakage. The variable voltage supply and the bridge make this investigation easy.

Capacity should not be more than 20% below rated capacity nor more than 35% above rated capacity except on low voltage condensers, where the capacity may be 100% higher than the rated capacity.

The resistance value read on the bridge is the best criterion as to whether replacement is necessary. A new condenser of 400 volts 8 mfd. rating should normally be less than 10 ohms. On lower voltage condensers, the resistance will be higher, and on lower capacities the resistance will be higher. On old condensers the resistance may rise to over 200 ohms and condensers in this condition should be replaced if difficulty is experienced with a circuit.

It is to be noted that condensers which show high a.c. resistance on 60 cycles will also have a high impedance at intermediate and radio frequencies and may cause the receiver to be unstable if they are across the output of the filter or used as by-pass condensers.



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By V. W. Hodge

How to Re-Cement Tube Bases and Caps

By Joseph E. Soos

Bases and control-grid caps frequently pull loose from tubes and few servicemen know how to re-cement them in place. This may be quite easily done. Secure from a paint-shop a ½ lb. package of "litharge" (yellow oxide of lead) and ½ pt. of glycerine.

To replace a control-grid cap: Clean the top of the tube thoroughly and solder a few inches of bare No. 24 wire to the exposed lead. Now, mix a small amount of litharge with a sufficient quantity of glycerine to form a thick paste. Fill the cap full of this paste and pass the wire through it and through the hole, pressing the cap firmly down on the glass and bending the wire over sharply to hold it in place. Tightly wrap several lengths of tape lengthwise around the tube and over the cap and let the tube stand for 24 hours. Solder the grid lead and clip off excess wire and it is then ready for service.

To replace a tube base: Solder 4 inches of No. 24 to each lead. Clean the base and stem of the tube thoroughly and then apply a small amount of litharge paste to the edge of the base, where it comes in contact with the glass. Carefully pull the leads through the socket prongs and press the tube firmly down in the base, cleaning away excess paste with a cloth. Now, plug the tube into a socket and place a four to five pound weight on the top, leaving it there for 24 hours. Remove the weight, solder and clip the leads. Use a good grade of flux on all joints.

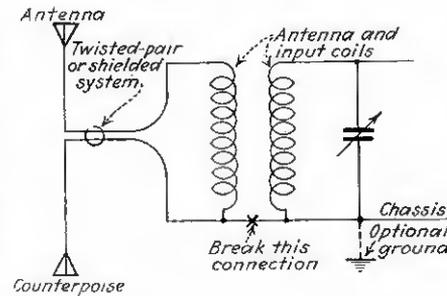
Power-Line Noise Pickup Reduction

By Morris Chernow

Most servicemen have noticed that receivers operating from a.c. power-lines are generally noisier than battery models. This has been attributed to the greater overall sensitivity of the more modern all-electric sets. The explanation, in my estimation, is not an accurate one for I have found that battery sets of known high sensitivity are quieter than a.c. models of equal power.

Electric sets, I have found, pick up considerable noise from their power-supply lines and experiment convinces me that the antenna coil is the offender. The universal practice of grounding primary and secondary to a common point, a hangover from the old battery set days when hand-capacity effects required this, causes trouble in electrified models. Such connection produces capacity coupling between the power-line, which is inductively grounded, and the antenna, also inductively grounded.

Radio frequency disturbances in the power-line are conveyed by the common coupling into the antenna system and in many instances where radiation of noise and normal pickup by the receiver is suspected of



causing trouble the condition described is responsible. Resonant hum is often produced by the same circuit condition.

Where noise pickup is caused by the capacitive coupling described it can generally be eliminated by cutting the connection between the primary and secondary of the antenna coil as shown in the accompanying diagram and by using a counterpoise in place of a ground and by carrying

Serviceman Dugan's "coupon-plan" brought in 250 new customers. Read about it on page 33

both leads to the receiver input as a twisted pair. The chassis may be grounded or not, depending upon the results produced by actual experiment in each individual installation. Shielded systems will often be found unnecessary but where true noise radiation exists will produce improved results when used in conjunction with the set circuit alteration described.

Tests indicate that avoidance of a ground in connection with the antenna coil not only does not reduce signal strength but in many cases positively increases it. For maximum benefit the antenna coil and its connecting wires should present a minimum of capacity to the receiver chassis.

Try cutting the common ground connection between primary and secondary of the antenna input transformer where shielded antenna systems fail to completely eliminate noise and note the improvement.

Dynamic speakers using extremely rigid center mountings (such as Philco 90) sometimes develop poor tone due to hardening of the mounting. This can be cured by carefully cutting 6 or 8 radial slits from near the center toward the outer edge. Do not cut right to the center or edge as this severs the mounting.

Slitting makes the hardened mountings more flexible, allowing normal movement of the cone in the airgap.

Chassis-Short Warning Lamp

By M. H. Sootin

A 300-watt lamp in series with the shop's 110 volt a.c. line detects power transformer and filter condenser shorts the instant a set having either defect is plugged in. If the set under test is normal the lamp will not light. A shorted filter condenser will make it glow a dull red. And a shorted power transformer will permit it to light brilliantly.

A lamp used in this manner will also prevent shop fuses from being blown by shorted chassis. It does not introduce enough resistance in the line to seriously drop voltage unless the supply is abnormally low to begin with.

Cementing Loose Voice-Coil Turns

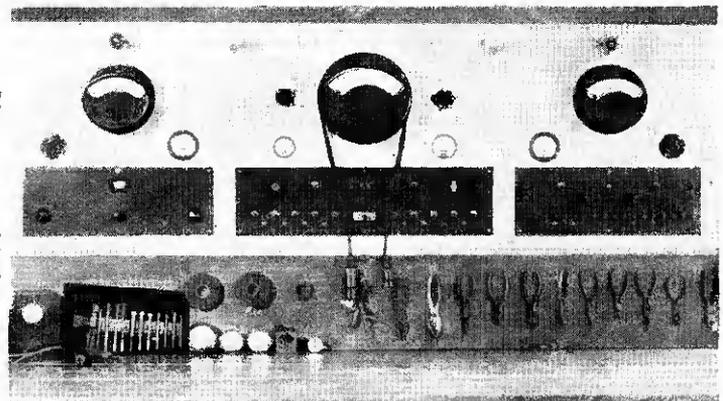
By Albert D. Jacobson

Loose voice-coil turns, which cause distortion, are frequently on the inner layer, where they cannot easily be cemented. A 2-cubic centimeter hypodermic syringe and a bottle of acetone, obtainable in drug-stores, makes this work easy. I have repaired over a hundred coils with no comebacks.

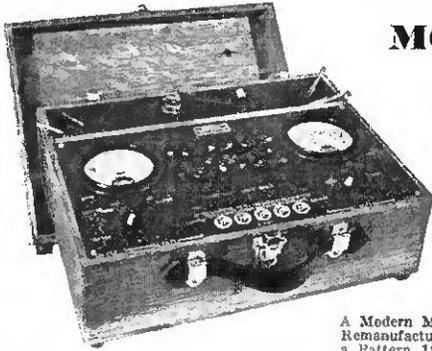
Dissolve enough scraps of celluloid in the acetone to bring the mixture to a cream consistency. Fill the syringe about half full and put the needle point on. Insert the point on the inside of the voice-coil, between the paper and the coil itself, and force the mixture in until it completely

The Last Word

Dunphy's Lab., Trenton, New Jersey, submits this example of good layout



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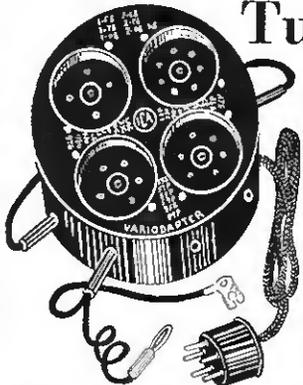
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fills all the tiny spaces around the wires and starts oozing out at the edge. Repeat the process at three or four points. The progress of the mixture can be seen through the paper, making it easy to see when the spaces are all filled.

Empty the syringe while the coil is drying and thoroughly clean the needle by running a fine wire through it. Quick action is necessary to prevent the mixture from setting in the syringe. Leave the wire in the needle until ready to use it again.

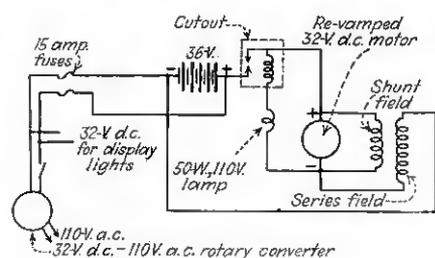
Paint the outside wire of the drying coil with the mixture and allow it to dry for about half an hour.

Sound Truck Power Supply

By Sam Epstein

The problem of obtaining adequate current supply for the operation of sound trucks is a difficult one. The three prevalent methods of supplying a.c. have definite limitations. These are: 1. A.C. generator driven by truck engine . . . this is expensive and provides no reserve power for emergency use. 2. Bank of storage batteries driving a rotary-converter . . . this necessitates a relatively short driving range, requires bothersome nightly charging. And, 3. Independent gas-engine-driven generator . . . this requires a large, well-ventilated truck and lacks reserve.

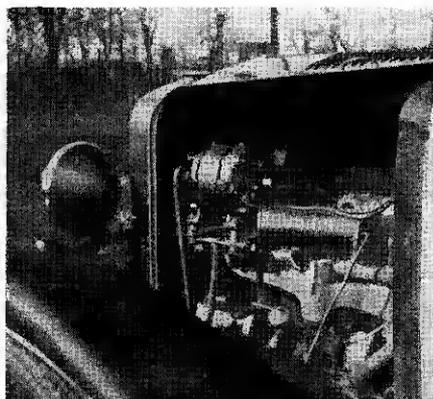
I have installed a system which uses the truck engine for motive power and also storage batteries for emergency use. It includes a 150-watt, 32 volt d.c. to 110 a.c. rotary-converter, which supplies ample



a.c. for the operation of a large amplifier when operated from a bank of six automobile batteries. To make the system self-sufficient I bought a 32-volt, compound-wound, d.c. motor with a $\frac{1}{2}$ horsepower rating. This was equipped with a 2 in. pulley, mounted on the truck motor-block, and belt-driven from the generator having a 4 in. pulley. The d.c. motor, operating as a generator, delivers 9 amps. at 38 volts for series charging when the truck is running 15 m.p.h.

I reversed its series field. Thus, as car speed increases beyond 15 m.p.h. the series field counteracts the shunt field and keeps the voltage and current more or less constant. Even at 50 m.p.h., when the d.c. motor is turning over at four times its normal speed, it never delivers more than 11 amperes, whereas operation without this alteration would blow the field coils.

Where the proper voltage is not at once obtained a resistor in series with the shunt field will lower it while a resistor shunted across the series field will raise it. I use a standard automobile



cutout in series with a 50-watt, 110-volt lamp which, in my case, cuts the generator out when it reaches exactly 36 volts. A 2 mfd. condenser from each brush of the motor to ground is useful as the system is not otherwise grounded.

Thirty-two volt bulbs are used for display, the system providing ample power. If more is required I would suggest the use of a $\frac{1}{2}$ hp. motor capable of supplying 20 amps.

TRICKS of the TRADE

A-K. Unusually sharp volume control cut-off in model 85 can generally be remedied by trying several 24's in the a.v.c. socket. No detector plate voltage on the 37 is most frequently caused by shorting of the plate to ground by-pass condenser and not burnt out series resistor or transformer primary. "Choppy" reception in model 38 is commonly traceable to shorting of the audio output condenser. Unsolder green wire with yellow tracer from bottom terminal strip and connect a new condenser in series. Noisy volume control operation in the same model is often due to a broken lead of the r.f. coil primary near the lug.

KOLSTER 43. Fading is generally traceable to an open 0.6 mfd. by-pass in the screen-grid circuit.

RCA 48. Fading, intermittent signals are most often caused either by a burnt-out section of the volume control or corroded variable condenser clips.

COLONIAL 32. Open section of the 4-section by-pass unit in the first can and loose lugs on the outside of volume control frequently cause fading.

SPARTON 740. A pin, fitting into a small socket, connects the band-pass unit to the r.f. amplifier. Corrosion at this point is a common cause of fading.

COLONIAL 33, 34. Failure of the tapped 121,000 ohm resistor, comprising an 11,000 ohm section supplying r.f. plate voltage, 60,000 ohm section supplying screens and 50,000 ohm section is chief cause of trouble. Replace it with one of higher wattage.

VICTOR R.E. 35. No signal. Look

for open 500,000 ohm detector plate resistor.

STROMBERG 654. A leaky 0.3 mfd. cathode by-pass section in the first r.f. stage is often at the bottom of fading trouble.

FADA 43. Distortion can be traced, as a rule, to lowering in value of the 125,000 ohm resistor from screen-grid to chassis. Replace with exact value.

BOSCH 31. Suspect a faulty 300,000 ohm resistor in the i.f. stage when fading occurs.

ZENITH 91. Fading, accompanied by tricky local switch operation, is usually caused by trouble in the 2,800 and 3,600 ohm resistors in series across the d.c. voltage output. Replace with higher wattage types.

APEX 10. Noise is repeatedly discovered to be in a defective 8 mfd. dry electrolytic condenser by-passing the detector plate resistor.

MAJESTIC 70. Try shield-painted 27's in this set. They materially reduce hum.

MAJESTIC 201. Oscillation, or sharp whistle, when adjusting the volume control near its low position is traceable to the bolt holding the speaker to the baffle. The bolt extends too near the spray-shield of the first a.f. 35. Cut it off close to the nut and, if necessary, pull the tube away with a rubber band. Trouble does not occur when the chassis is out of the cabinet.

STEWART-WARNER 950. Partial breakdown of the screen resistor burns out the volume control. Always replace the resistor when putting in a new control.

CROSLEY 124. Intermittent reception, temporarily cured by touching by-pass condensers or resistors, is the fault of an intermittent open in the 0.1 mfd. condenser connected between screens and ground. While the set is inoperative a small increase in first r.f. plate current will be noted.

AIRLINE 811. Inoperative volume control is caused by alteration in value of a 25,000 ohm carbon resistor. Replace with one of higher wattage rating.

AIRLINE "Challenger." Complaint: "Radio smokes." Replace burned 4,000 ohm carbon resistor with a wire-wound type. Replace shorted 1 mfd. condenser with a new 400 volt type.

PHILCO 90-X. "Cutting off" of reception is due either to use of poor tube as oscillator or to cathode resistor. Change the resistor from 15,000 to 10,000 ohms.

FRESHMAN, CLARION. Use of Arcturus 57's and 58's on some models frequently causes trouble as these tubes are slightly higher than other makes and the caps short to shields. Glue a piece of blotting paper to the inside of the shields.

BRUNSWICK 15. Reduced volume accompanied by low screen voltages and abnormally high plate can be corrected by replacing the 35,000 ohm orange resistor in the front of the chassis.

One Hundred MILLION!

In national magazines and newspapers all over the country, nearly *one hundred million* advertisements will be used during the next month to invite the public to the Spring Showing of Kelvinator's finest line. And this gigantic bombardment is only the opening gun in the biggest Spring Drive in Kelvinator's 19 years in the industry.

With this new line — and with this big advertising and sales promotion program behind it — 1933 couldn't help but be *another Kelvinator Year!*

Why not make *your organization* a part of what is going to be the outstanding electric refrigeration success in 1933? Don't wait for the mails—wire or phone right now—every day counts! . . . KELVINATOR CORPORATION, 14263 Plymouth Road, Detroit, Michigan.

(670)

Kelvinator

Announcing

three more record making G-E values

Amazing new low-priced sets give G-E dealers a lead in every price market . . .



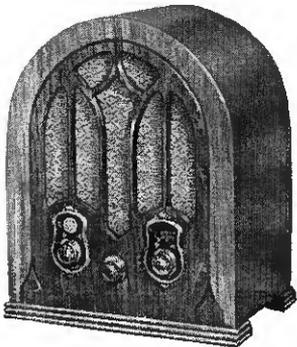
MODEL K-60

● New 6-tube superheterodyne Table Model—with six-inch dynamic speaker, two-point tone control, the two new tubes used in K-50 plus another new type tube used as second detector and A.V.C. Exceptionally handsome cabinet, following highly successful early Mantel Clock design. List price, **\$37⁵⁰**

BY ADDING these three beautiful new models, and the recently announced Little G-E (A-C/D-C) set, General Electric gives you a *complete* line of fine radios that range from \$19.95 to \$269.50—and every set is backed with all the sales-clinching prestige of the famous G-E monogram!

These worthy small brothers of the radios that win the tone-tests have amazing value, in beauty and performance, built right into them. Value that belies their low price tags. Value that's so remarkable and obvious that these electrical thoroughbreds are sure to show clean heels to the entire low-priced radio field.

Get in the money this year—*all the money*. And let the new and complete G-E line help you to it! General Electric Company, Merchandise Department, Section R-443, Bridgeport, Conn.



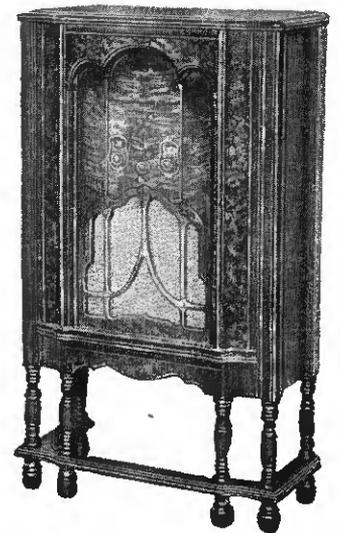
MODEL K-50

● New 5-tube superheterodyne Table Model—with dynamic speaker, two-point tone control, and two entirely new type tubes; new heater pentode output tube and new oscillator-detector tube. Unparalleled quality of performance in the low-priced field. List price, **\$24⁹⁵**

MODEL K-65

● New 6-tube superheterodyne Console Model—with the same chassis as K-60, but larger dynamic speaker. Housed in unusually attractive six-legged console cabinet, fine dark walnut. Reproduction superior to many larger sets. List price,

\$49⁹⁵

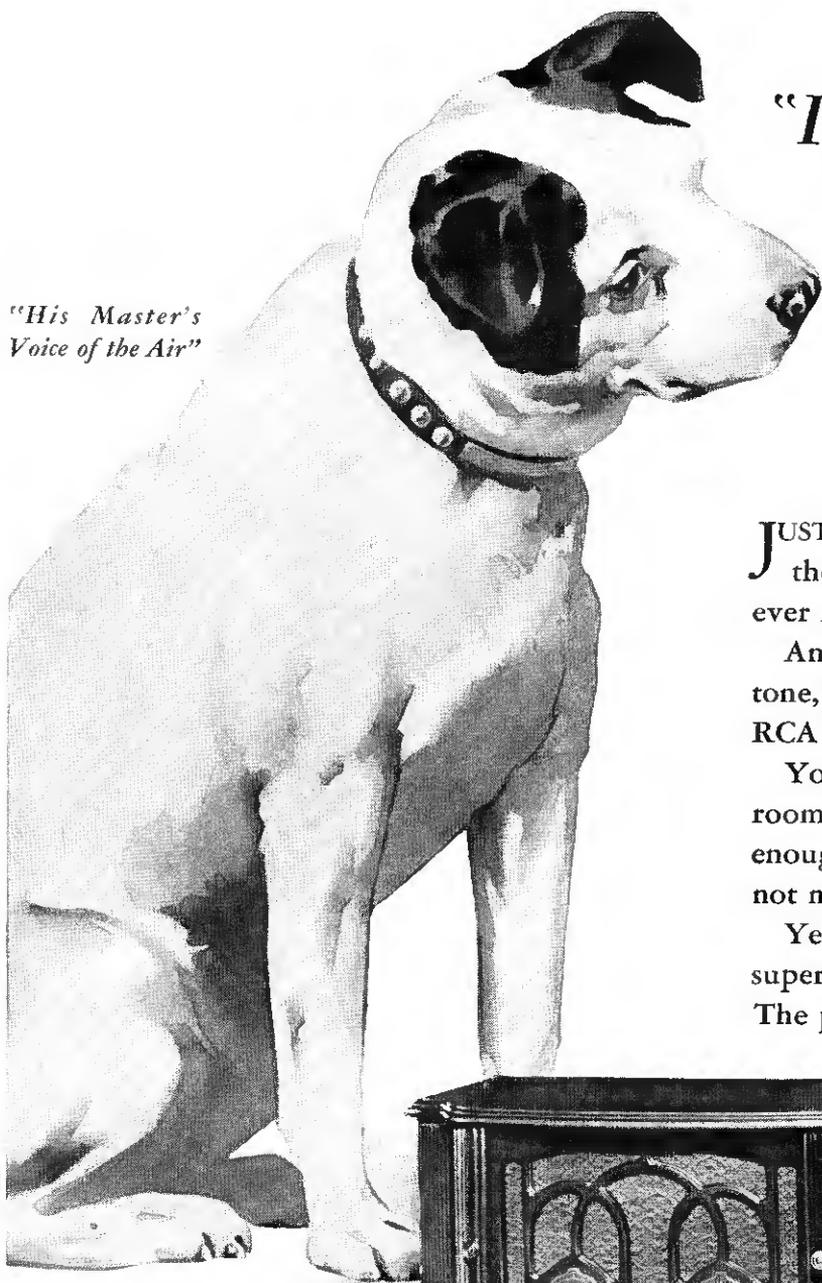


GENERAL  ELECTRIC RADIO

"Meet my new

*"I'm introducing four
of the finest small
radios you've ever
SEEN or HEARD"*

*"His Master's
Voice of the Air"*



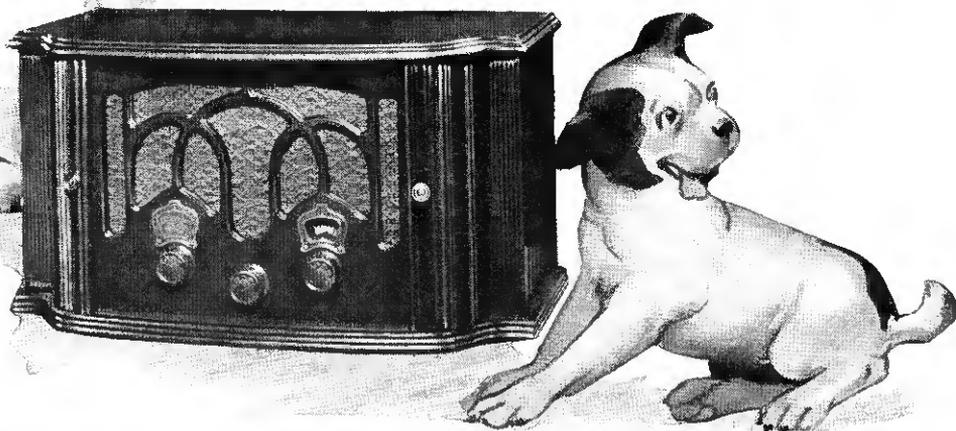
JUST look at this fine new family . . . four of the smartest, livest, handsomest small sets ever made.

And each one has all the quality, all the tone, all the performance features, that make RCA Victor radios famous.

You can sell them for the living room, bedroom, porch, kitchen . . . any place where there's enough room to put a shoebox—for they're not much bigger than that!

Yet complete—five-tube, dynamic speaker, superheterodynes. They're a lot of real radio. The prices? From only \$28.50 to \$34.50!

TAMBOUR—28D . . . 5-tube superhet, dynamic speaker, tone control. In brown mahogany with sliding "tambour" doors—very smart. List price \$32.75

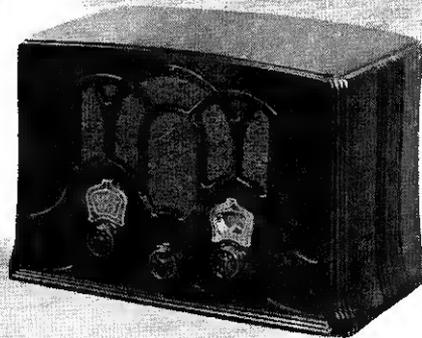
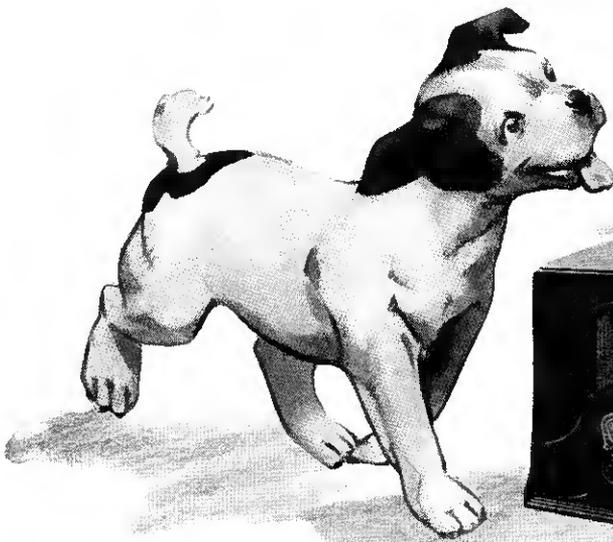


RCA Victor

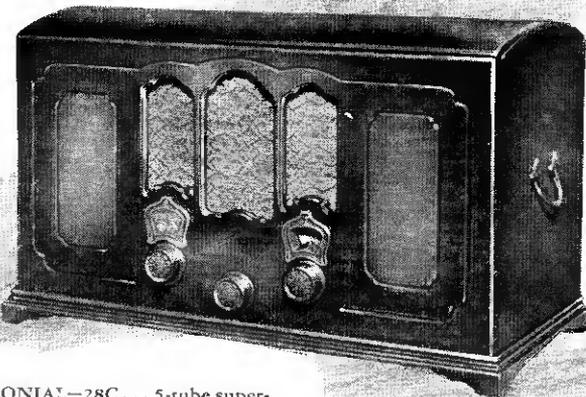
family!" The Carryette Quartette



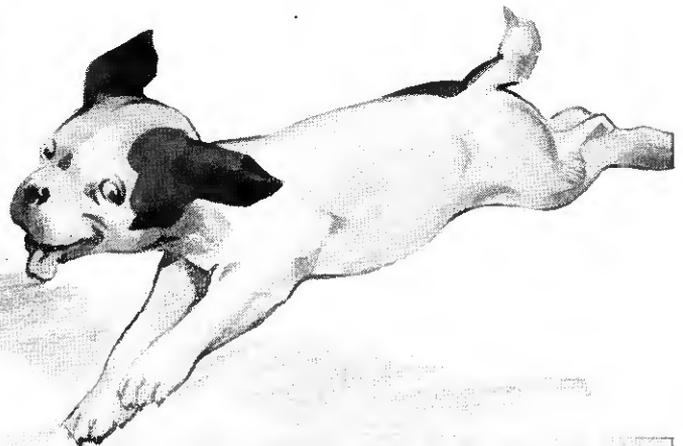
SHERATON-28E... 5-tube superhet., dynamic speaker, tone control. In a lovely Sheraton walnut veneered cabinet with pivot doors. List price \$34.50



CHEST-28B... 5-tube superhet., dynamic speaker, tone control. Walnut veneered. List price \$28.50



COLONIAL-28C... 5-tube superhet., dynamic speaker, tone control. "Colonial Chest" model, maple, with rounded top and end handles. List price \$29.75



Radio Sets

RADIOS
PHONOGRAPH COMBINATIONS
VICTOR RECORDS

ATWATER KENT RADIO

ANNOUNCING *still another* 1933 Sensation



WHAT a lucky industry radio is! When the lure of the early crystal set gasped its last, along came the tube detector. When the family was fed up with twenty-nine parts scattered on a table, the set-in-a-cabinet made its debut. Later came the battery eliminator, then the all-electric set, then the dynamic speaker. Next the radio set housed in a decorative cabinet, then new tubes. Still later, when the public's purse lost some of its luster, the industry was born to make a fresh

"music in the air," not confined to the four walls of a house, but entertainment and music wherever a car can penetrate.

Auto radio manufacturers, tho perhaps not all dealers and distributors, know the rapid strides already made by auto radio set sales: 34,000 sold in 1930, 108,000 sold in 1931, 143,000 bought last year and in 1933 at least a quarter of a million are expected to reach the public.

Ride the Tide that Keeps on Rising



EVER since the first Leonard Electric was introduced, Leonard sales have continued to increase at a rate that has attracted the attention of the entire refrigeration industry. In 1932 more than twice as many Leonards were sold as in 1931—and the Leonard sales curve still climbs sharply.

There are sound reasons for this phenomenal success, and they are reflected in hundreds of letters Leonard has received from dealers. These letters are not like any other refrigeration dealer letters you ever saw.

The reason they are different is that *the experience of Leonard dealers is different*. They have something to say—results to quote—real success to talk about. We'll be glad to send you copies; they reflect an enthusiasm for the Leonard product, policies and program that we think is unique in the industry.

The Leonard tide keeps on rising—with the weight of Leonard reputation, beauty and quality behind it. The new Leonard Electric (10 models—4 all-porcelain) offers an unequalled combination of convenience features. Prices begin at \$112.00 (f. o. b. factory, installation and tax paid). It is backed by the strongest advertising and selling program in the company's history.

If you are interested in knowing what Leonard dealers think of this profit opportunity for 1933, write or wire us.

LEONARD REFRIGERATOR COMPANY
14259 Plymouth Road, Detroit (652)



Only Leonard has the LEN-A-DOR

LEONARD

ELECTRIC REFRIGERATOR

I am interested in the opinions of Leonard dealers about the Leonard franchise.

Name _____

Address _____

City _____ State _____

(14259)

PRICES START AT \$112 F. O. B. FACTORY • INSTALLATION AND TAX PAID



WHAT a lucky industry radio is! When the lure of the early crystal set gasped its last, along came the tube detector. When the family was fed up with twenty-nine parts scattered on a table, the set-in-a-cabinet made its debut. Later came the battery eliminator, then the all-electric set, then the dynamic speaker. Next the radio set housed in a decorative cabinet, then new tubes. Still later, when the public's purse lost some of its girth, the midget was born to make a fresh appeal to people and incidentally to help the radio industry hold some of its volume. More recently the sub-midget or pee-wee set gives the radio industry a chance to show that radio belongs in many other rooms besides the front parlor.

Today there's a new Moses to lead the radio industry into another promised land. This Moses is Auto Radio. At last we have truly

"music in the air," not confined to the four walls of a house, but entertainment and music wherever a car can penetrate.

Auto radio manufacturers, tho perhaps not all dealers and distributors, know the rapid strides already made by auto radio set sales: 34,000 sold in 1930, 108,000 sold in 1931, 143,000 bought last year and in 1933 at least a quarter of a million are expected to reach the public.

But auto radio isn't all skittles and beer. Distributors and dealers must learn a few lessons on auto radio sales, installation and service. Manufacturers, too, must gain the proper distribution for their merchandise. And the makers of auto radio parts and accessories must find the right markets for their products.

Radio Retailing believes in the future of auto radio. In its pages was printed the

34,000 Auto Radios in 1930—143,000 Auto Radios in 1932—

A MOSES - Music in the Air

first article on the subject ever to be published in a radio business magazine. Consistently the magazine has pointed out market opportunities, made sales and service sug-

gestions and reported the methods by which distributors and dealers were handling auto radio sales, installation and servicing problems.

Now, *Radio Retailing's* April "Auto Radio Issue"

TO help put Auto Radio over, *Radio Retailing's* April number will be a special Auto Radio Issue. It will bring up-to-date for the dealer, distributor and service organization the progress made on auto radio. There will be a listing of manufacturers, a review, material on how dealers and jobbers are actually selling sets, material on auto radio in the "Service and Installation Section."

Also in *Radio Retailing's* April "Auto Radio Issue" there will be advertisements of auto radio set makers and suppliers of auto radio accessories and parts. These manufacturers through *Radio Retailing* will be building up an essential national trade distribution. They will be promoting inquiries and actual sales. They will be reaching the worthwhile radio retailers and distributors, because *Radio Retailing* has more subscriber-readers than

any other trade publication in the radio industry. Furthermore, thru *Radio Retailing* manufacturers will be reaching an important class of readers exclusively covered by this magazine—the auto dealers and auto supply houses now selling radio equipment.

Here will be an opportunity for both dealers and jobbers on the one hand and auto radio manufacturers on the other hand to further their interests in Auto Radio. Naturally, this April "Auto Radio Issue" will have unusual reader-interest, unusual advertising appeal and unusual reference life. Manufacturers may be interested in making advertising space reservations at once, because advertising forms close in New York on Friday, March 24th.

The auto radio leaders among manufacturers, jobbers and dealers are now in the making.

Radio Retailing

—a McGraw-Hill publication

Member of the ABC and ABP

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

Other offices in principal cities

250,000 Auto Radios in 1933

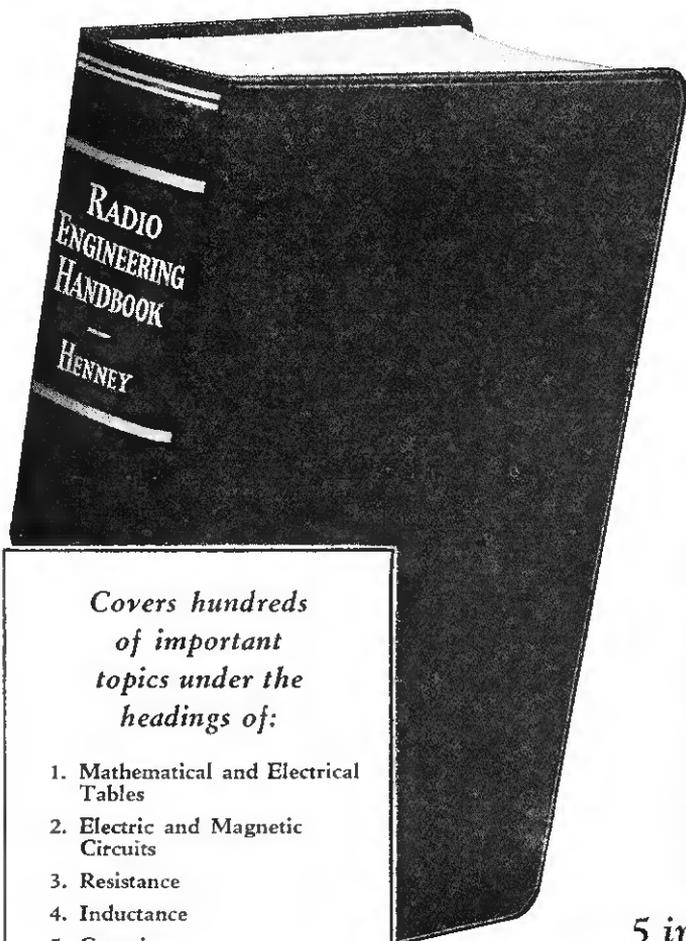
Now available to the radio field

a comprehensive, up-to-date, and
authoritative handbook of engineering
principles, standards and practice

—Just published—

Henney's
**RADIO
ENGINEERING
HANDBOOK**

Prepared by a staff of 22 specialists
Editor-in-Chief, KEITH HENNEY, Associate Editor, *Electronics*
583 pages, 4½x7, 507 illustrations, \$5.00



Covers hundreds
of important
topics under the
headings of:

1. Mathematical and Electrical Tables
2. Electric and Magnetic Circuits
3. Resistance
4. Inductance
5. Capacity
6. Combined Circuits of L, C, and R.
7. Measuring Instruments
8. Vacuum Tubes
9. Oscillating Circuits
10. Detection and Modulation
11. Audio-frequency Amplifiers
12. Radio-frequency Amplifiers
13. Receiving Systems
14. Broadcasting
15. Rectifiers and Power-supply Systems
16. Loud-speakers and Acoustics
17. High-frequency Transmission and Reception
18. Code Transmission and Reception
19. Television
20. Facsimile Transmission
21. Aircraft Radio
22. Photocells
23. Sound Motion Pictures

NOW there is made available to the radio field an engineering handbook measuring up to all the standards of competent authorship, careful and thorough selection of material, and accuracy of presentation, to be found in other McGraw-Hill hand books in various fields of engineering.

Within the covers of a convenient 583-page volume has been compressed a great deal of constantly needed reference material covering all fields and aspects of radio engineering, from fundamentals to latest practical applications.

5 important features of this book

- 1 The book is thoroughly technical in nature—written by engineers for engineers—gives emphasis to design data rather than descriptions of apparatus.
- 2 Every section has been written by an engineer or physicist chosen because of his expert knowledge of a particular phase of the subject matter. In many cases the authors are daily engaged in the design, manufacture, or operation of the apparatus they describe.
- 3 The scope is broad, ranging from fundamentals to discussion of newest tubes, newest circuits, class B amplifiers, power supply systems, short-wave systems, etc.
- 4 The book is right up to the minute, covering television, sound motion picture, facsimile transmission and aircraft applications.
- 5 The book abounds in circuit diagrams, tables, charts, formulas, design equations and data. The circuits described quantitatively are those in use today, or soon to be widely used.

10 days' Free Examination

Not only the radio technician, but every man interested in the design or manufacture of radio or television transmitters and receivers, sound motion picture apparatus, and apparatus utilizing vacuum tubes and photocells, will want to see this book. Send for it today, for 10 days' examination without cost. Mail this coupon.

McGRAW-HILL FREE EXAMINATION COUPON

McGraw-Hill Book Company, Inc., 330 West 42nd St., New York, N. Y.
Send me Henney's Radio Engineering Handbook, postpaid, for 10 days' free examination. I will send \$5.00 or return the book within 10 days of receipt.

Name

Address Position.....

City and State..... Company..... F-RR-3-33

(Books sent on approval in U. S. and Canada only.)

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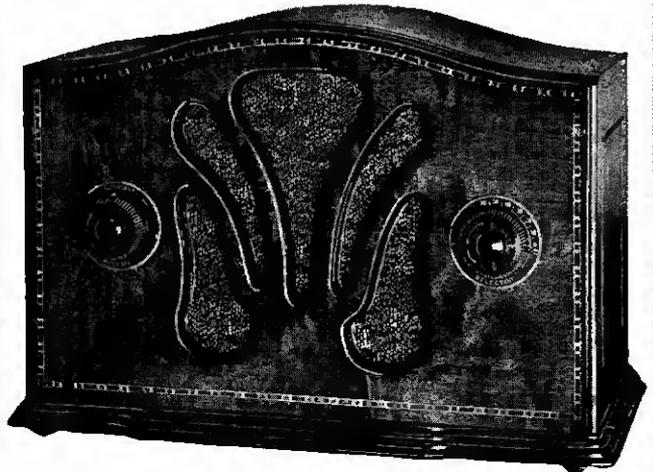
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DEMONSTRATE IT! — 10 DAYS FREE TRIAL



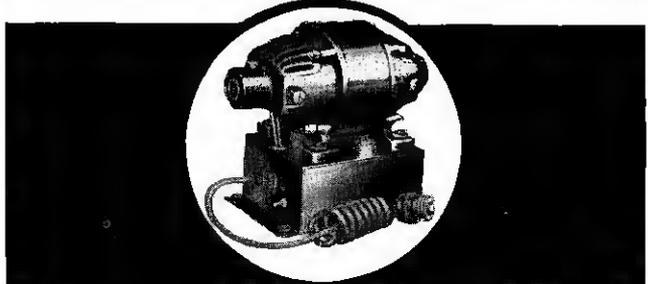
NEW MODEL 30
5 TUBE—3 GANG
SUPERHETERODYNE
UNIVERSAL AC-DC
\$29.50 list
Complete with RCA tubes—tax paid

● Challenge! Demonstrate its superiority over any 5 tube super currently in the field (nationally advertised or otherwise). Tubes 2—77—78—25Z5—43. ● Guaranteed to pick up weak signals equal to large superheterodynes. ● Tone response, sensitivity and selectivity truly sensational. ● Free demonstration trial to well rated houses without obligation. Size 10 3/8" x 6 7/8" x 5 1/2" — Net weight 7 lbs. Full line of universals, midjets and consoles.

Distributor and dealer net cost offers long profit opportunity.

Licensed by RCA & associated companies

EMPIRE ELECTRICAL PRODUCTS CO.
102-6 Wooster Street, New York City
"Established 1921"



JANETTE ROTARY CONVERTERS

For Farms—Ships
—City Apartments
—Automobiles

Wherever the current supply is D.C. use JANETTE Rotary Converters to operate your AC receivers.

JANETTE Converters are filtered to give radio results as good as, or better than, that obtained with central station AC. Built to outlast the radio set.

Available in 15 sizes. Capacities from 20 to 2500 watts. Input voltages of 6, 12, 32, 115 or 230 volts. Standard machines deliver 110 volts, 60 cycles AC.

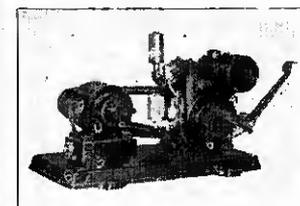
MAIL COUPON FOR DETAILS

JANETTE MFG. CO.
555 W. Monroe St.
Chicago, Ill.

Gentlemen: Please send prices and details on your:

- Rotary Converters.
- Auto-B-Power (B-eliminator for auto-radio)
- Gas Engine Generators.

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



SEARCHLIGHT SECTION

EMPLOYMENT and BUSINESS OPPORTUNITIES—SURPLUS STOCKS—DISCONTINUED MODELS

UNDISPLAYED—RATE PER WORD:
 Positions Wanted, 5 cents a word, minimum \$1.00 an insertion, payable in advance.
 (See ¶ on Box Numbers.)
 Positions Vacant and all other classifications, 10 cents a word, minimum charge \$2.00.
 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.....\$7.50
 2 to 3 inches..... 7.25 an inch
 4 to 7 inches..... 7.00 an 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

FOR SALE

SENSATIONAL Microphone Value—Universal Model "Y"— Experimenters single-button, watch model type. 200 ohms. Pure gold spot center diaphragm. Only \$2.00, including valuable 1933 general catalog with diagrams. Universal Microphone Co., Ltd., Inglewood, Calif.

AGENTS WANTED

MEN WANTED. We require a man in every community, and every industrial plant, full or spare time. The work pays well, from \$1 to \$3 an hour. You simply recommend and call to the attention of business men and fellow employees business and technical books published especially for them so they can make more money. No experience required. You can make a substantial extra income quickly and easily by simply showing our lists. Complete equipment free. Write Tom Crawford, Dept. R.R., McGraw-Hill Book Co., 330 West 42d St., New York City.

MANUFACTURERS' AGENTS WANTED CONDENSERS

A few sales territories open to established sales organizations actively contacting wholesalers or distributors. High quality product with good sales and income possibilities.

MORRILL AND MORRILL
 30 Church St., New York

HUGE SAVINGS IN USED PUBLIC ADDRESS EQUIPMENT

Send for bargain lists. Motion Picture and Sound Systems.

SALES ON SOUND CORP.

Dept. RR, 1600 Broadway, New York

ANNOUNCEMENT TO DEALERS and SERVICE MEN

Service Parts and Special Test Equipment from the former Factory Serv. Dept. of A. H. Grebe & Co., Inc., also equipment formerly used for the manufacture of Grebe parts, have been purchased by the former Factory Manager & Assoc.

Transformers for dealers and service men for sets using from 4 to 12 tubes.

Write for descriptive data and Parts Price List

Grebe Radio Sales and Service Company
 137-28 Jamaica Ave., Jamaica, N. Y.
 (Owner former Factory Manager and Purchasing Agent of A. H. Grebe & Co., Inc.)

RADIO TUBE EXCHANGE OF AMERICA

123 Liberty Street, New York, N. Y.

Dealers have been looking for these features in tubes.

1. A tube that can be sold below list and dealer still realizes a good profit.
2. A tube concern that is reliable.
3. Tubes are boxed in Popular Perryman Boxes, guaranteed for 3 months.
4. Tubes that were manufactured to sell at list.

We offer to the dealers at the following prices.

201A—\$.25	230—\$.38	89—\$.40
112A—.30	231—\$.38	56—.32
171A—.28	232—.45	37—.35
226—.27	233—.50	38—.35
227—.28	222—.50	59—.40
224A—.35	234—.40	82—.35
235—.35	236—.40	83—.35
243—.30	237—.35	210—1.00
280—.28	238—.35	250—.90
247—.35	239—.40	281—.80

Orders must be accompanied by 20% cash. Jobbers territories open.

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.

Your copy is ready

Featuring Over 3000 Items
 Including many "hard-to-get" replacement parts. Ham Supplies. Prices lowest in the business.

24-Hour Service.



Send for it today

BALTIMORE RADIO CORP.
 725 BROADWAY Dept. A NEW YORK

Who's Carrying on for You?

EXECUTIVES are deserting their desks to go out into the field to investigate conditions, form plans and add their energy to actual sales getting. . . .

But who's to carry on at the home office when the boss is riding the Pullmans?

Here's an exceptional man, made-to-order for such a situation. He's the perfect assistant to stay at the home office, see that the wheels keep running and speed their acceleration. He's the kind of chap the Biblical writer had in mind when he spoke of the merits of those "who abide by the things at home."

This man's job—now vanished through no fault of his own—has been to

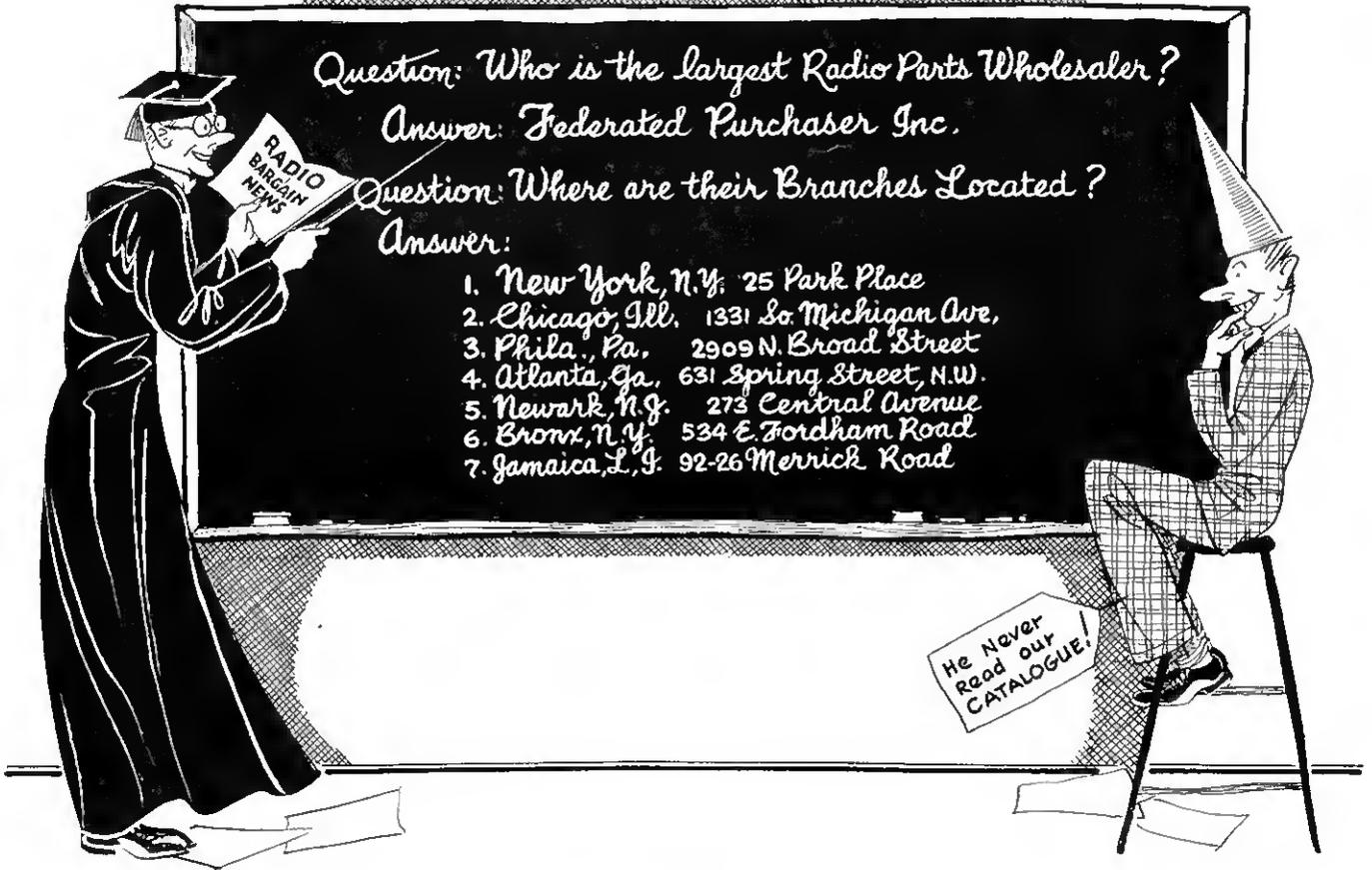
- manage the office when the boss has been away
- relieve his executive of personnel management
- supervise correspondence, inside and outside
- take care of the production of his company's products
- assist in the shaping and execution of advertising, sales promotion, market analysis and statistical work
- keep usable, efficient records for the guidance of the business.

Add to this man's capabilities the following jobs and special talents: completely familiar with printing, engraving and paper problems; correspondent; office routine; accounting; an ability to generate ideas; a faculty of carrying on unperturbed by surroundings or circumstances; a likeable personality that makes it easy for him to work with people.

This advertisement is written by his boss. For further details or interview, write

PW-175, Radio Retailing, 330 West 42d Street, New York City

SCHOOL OF RADIO SAVINGS



TEACHER'S NOTE:

If you expect to be in this year's Class of Profits send for a copy of our new Spring 1933 Catalog No. 16. This catalog is a complete radio buying digest and radio book of knowledge, containing over 4,500 assorted radio items, including sets, tubes, meters, replacement parts, microphones, amplifiers, speakers, and other goods. Start saving today on your radio supplies.

Thousands of dealers are saving time and money by using our nearest branch.

Why not save half of your shipping cost?



Federated Purchaser Inc.

25 PARK PLACE NEW YORK, N. Y.

The Following Distributing Units Maintained for Your Convenience:

JAMAICA, L. I.
92-26 Merrick Road
PHILADELPHIA
2909 Broad Street

CHICAGO, ILL.
1331 S. Michigan Ave.
BRONX, N. Y.
534 E. Fordham Road

NEWARK, N. J.
273 Central Avenue
ATLANTA, GA.
631 Spring Street, N.W.

Now . . .

YOU DON'T HAVE TO SACRIFICE 43% OF YOUR PROFIT!

SEVEN FEATURES OF THE "NEW DEAL"

1. Greater discounts—dealers must have a greater margin to sell effectively and profitably. Servel gives it to them!

2. Lower prices—dealers today must be able to meet price competition as well as the quality market. Servel provides both!

3. New lines—the new Crusader line combines low price with quality. Servel Hermetic is a high quality line at reasonable prices.

4. A complete line—dealers can't sell prospects refrigerators they don't have! Servel offers the most complete line of electric refrigeration on the market today.

5. New advertising set-up—dealers today must find live prospects. Servel advertising goes direct to real prospects, over your name. Thousands of messages by Special Delivery. And that's not all!

6. New field of prospects—today each field of prospects is smaller. Servel opens up new fields.

7. New factory help—a direct factory contact—with direct factory help.

SERVEL for more than fifteen years has been an outstanding leader in the electric refrigeration industry. From this vantage point of experience and leadership Servel has made a thorough analytic study of the industry to reveal startling facts. As a result Servel again steps out far ahead of manufacturers in all lines with a "new deal". *Servel believes that greater profits belong to the man who actually makes the sale.*

If you have not been satisfied with the profits on your refrigeration business you will be interested in this new deal.

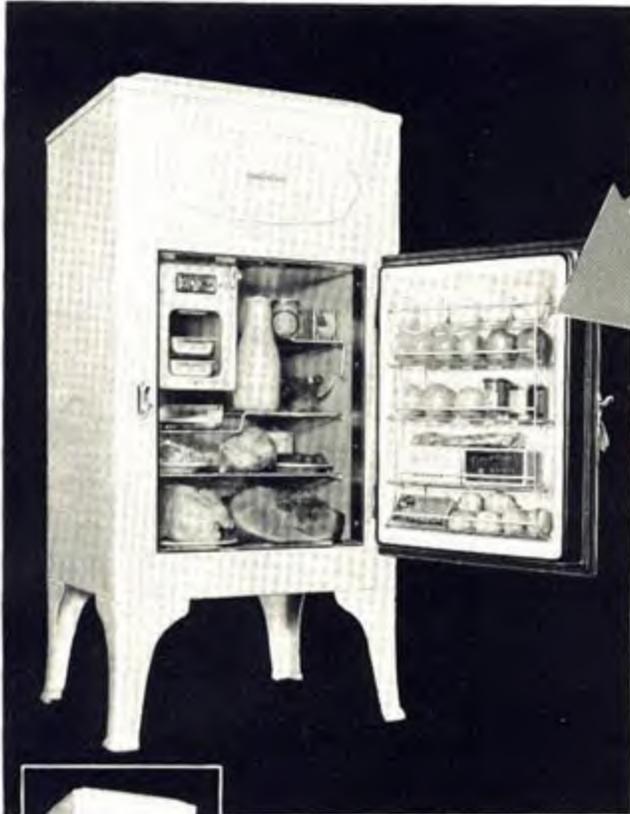
Manufacturers in other lines and outstanding retailers say that Servel has taken "an aggressive forward step"—"others are sure to follow"—"sound business planning"—"it's bound to succeed," etc.

SERVEL

EVANSVILLE, INDIANA



Servel's Modern 30-acre plant at Evansville, Indiana



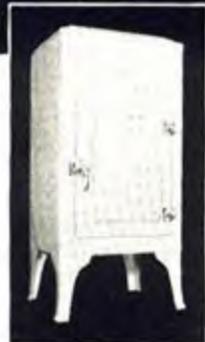
LOOK

The SHELVADOR

U. S. PATENT 1899922

An exclusive patented feature of the New CROSLLEY Electric REFRIGERATOR

See at a glance the wonderful convenience of the SHELVADOR



Here is the most sensational selling feature ever thought of in ELECTRIC REFRIGERATION... the most sensational advance in cabinet design since the first ice-box was brought out... a feature so self-evident so new, so convenient and helpful that every housewife after one glance will say: "That's what I must have!"

NOW the housewife merely opens the door... and there is the egg, bacon or the orange, or the butter, or any other small and ordinarily hard-to-find thing... It's on its shelf in the door. No reaching. No searching. No stooping. No lost time. No spilled food. There is what you're looking for.

Increases "Usable" Capacity 50%

Shelvador makes the "small" refrigerator "larger" by increasing its usable capacity. Try to put everything that goes into the Shelvador into your refrigerator and you'll be amazed. An orange takes as much "shelf room" as a bottle of milk in the ordinary refrigerator... In the Shelvador it only takes as much room as an orange should.

An Exclusive Crosley Feature

Shelvador is the newest and most important improvement in electric refrigeration since the invention of this great home necessity. To buy an electric refrigerator without the Shelvador is not only to deprive oneself of the great convenience and economy of Shelvador, but is to buy something already outdated. For no electric refrigerator can possibly be modern in the fullest sense without this feature.

SHELVADOR is an exclusive, patented feature of the new Crosley Electric Refrigerator. No other refrigerator manufacturer dare use it.

Low Cost—High Quality

When you buy a Crosley Electric Refrigerator, you not only save money on first cost, because of Crosley's quality-mass production methods; but you also save money because of the greatly enlarged "usable" capacity of the Crosley Electric Refrigerator due to the Shelvador. If the Crosley Electric Refrigerator did not have the Shelvador, it would still be the world's most remarkable refrigerator value. With the Shelvador, it goes far beyond the ordinary concept of "your money's worth" that there is nothing with which the value may be compared.

The Crosley Electric Refrigerator, famous last year for its trouble-free, service-free operation, has this year been refined in several points to make it even better. It is not possible, at any price, to get a better refrigerator value than the Crosley. It is not possible, in any other refrigerator to get the Shelvador. See your dealer. Study the Shelvador. Instantly you can see its advantages and convenience. Instantly you can see how amusing and unnecessary it is to have electric refrigeration without the Shelvador.

MODEL D-35 NET contents—3½ cubic feet. Shelf area—8 square feet. Overall Dimensions: Height, 50½"; Width, 23½"; Depth, 24"; Leg Height, 19½"; No. ice trays 2; No. ice cubes 42.



WITH SHELVADOR
\$95

MODEL D-45 NET contents—1½ cubic feet. Shelf area—10.6 square feet. Overall Dimensions: Height 56½"; Width, 23½"; Depth, 21"; Leg Height, 19½"; No. ice trays 3; No. ice cubes 63.



WITH SHELVADOR
\$105

MODEL D-60 NET contents—6 cubic feet. Shelf area—14.5 square feet. Overall Dimensions: Height 57½"; Width, 29½"; Depth, 25½"; Leg Height, 19½"; No. ice trays, 3; No. ice cubes 63.



WITH SHELVADOR
\$130

ALL PRICES INCLUDE DELIVERY..INSTALLATION..ONE YEAR FREE SERVICE

Montana, Wyoming, Colorado, New Mexico and west, prices slightly higher.

The Crosley Radio Corporation - Cincinnati
HOWEL CROSLLEY, JR., President. The Home of "The Nation's Station" - WJW

CROSLLEY

Electric REFRIGERATOR
WITH SHELVADOR

U. S. PATENT 1899922

THEY'RE FROM MISSOURI



TRANSCONTINENTAL & WESTERN AIR, INC.

10 RICHARD ROAD
MUNICIPAL AIRPORT
KANSAS CITY, MISSOURI

December 28, 1932

National Carbon Company, Incorporated
819 East 19th Street
Kansas City, Missouri

Gentlemen:

Eveready Raytheon tubes are proving very satisfactory in TWA radio equipment and are a contributing factor in the operation of mail, passenger and express schedules on the Lindbergh Line, the shortest route coast to coast.

Many of these tubes have already given more than four thousand hours service and continue to perform with reliability.

Transcontinental and Western Air's most recent development, in aeronautical radio engineering, is a new type, crystal control, eighteen tube superheterodyne ground receiver. Remote control, by means of automatic dial system relays, is incorporated in this new receiver. For use in this most modern radio equipment, TWA selected Eveready Raytheon four pillar tubes because of their dependability, performance and economy of operation.

Very truly yours,

Fred G. Betts
Asst. Purchasing Agent

SUCH a line as Transcontinental & Western Air, Inc. — the Lindbergh Line — must be shown. They *must* have the best. And so they use Eveready Raytheon 4-pillar Radio Tubes to insure reception of weather reports and other important data on their big air transports.

That's because Eveready Raytheon Tubes with 4 pillars supporting vital elements are firmly protected against damage through jolts, jars, and vibration. They give buyers assured clarity of tone and longer life at no extra cost.

You can recommend Eveready Raytheon 4-pillar Tubes to your customers with the assurance that they are used in the transcontinental planes of America's most important air transportation companies and in the radios of police cars in leading cities. Stock and display them for customer satisfaction, better business.

NATIONAL CARBON CO., INC.
General Offices: New York, N. Y.

Unit of  and Carbon Corporation

EVEREADY RAYTHEON 4-PILLAR RADIO TUBES

