

JANUARY, 1937

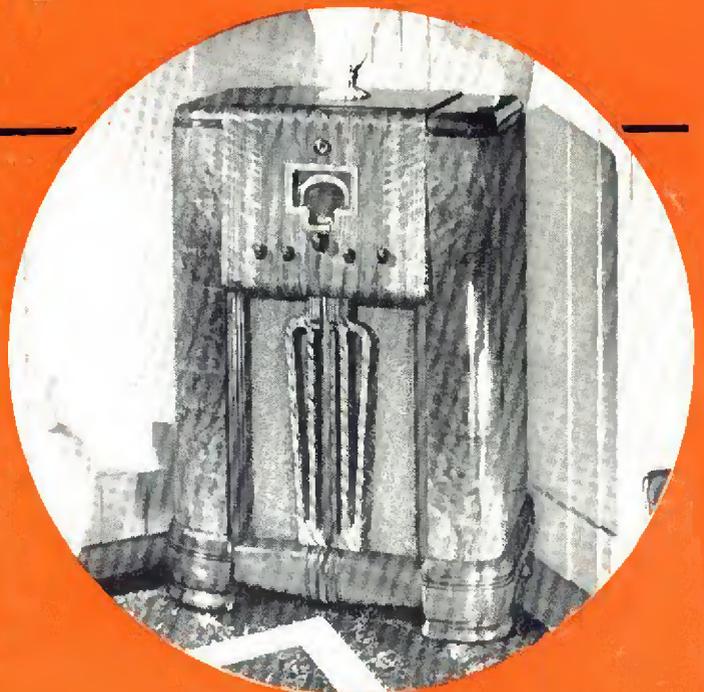
# RADIO RETAILING

McGRAW-HILL PUBLISHING COMPANY, INC.

25 CENTS PER COPY

## Again in 1937...RCA Victor makes selling easier...gives you Radio's Greatest Values!

Meet 3 of the many new models! RCA ALL THE WAY, they provide greater performance than ever—plus greater beauty of cabinet design! Talk about their features, their modest cost—and win new sales!



RCA VICTOR MAGIC VOICE MODEL 10K-1 . . . with Magic Brain, Magic Eye, Metal Tubes, 140-410 and 530-60,000 kcs. Beam Power Amplifier, Selector Dial, 10 tubes, AVC, ATC, 12 watts output and many other features.

RCA VICTOR MAGIC VOICE MODEL 9K-3. A price leader in the quality class, with Magic Brain, Magic Eye, Metal Tubes.

**Dealers! Important!**

### RCA ALL THE WAY!

"RCA All The Way" is a new selling slant you can use profitably. Major theme in RCA Victor's gigantic new advertising campaign, it will pay you to talk "RCA All The Way" to your prospects. Only RCA makes

everything in the industry, from microphone to loudspeaker. RCA, designing and building much of America's broadcasting equipment, applies practical knowledge of the peculiarities of broadcasting to its receiving sets.

RCA presents the Metropolitan Opera Company every Saturday afternoon. And "Magic Key of RCA" every Sunday, 2 to 3 P. M., E. S. T. Both on NBC Blue Network.

RCA VICTOR MODEL 8K-1 . . . with Magic Eye and Metal Tubes. 530-22,000 kcs. 8 tubes.

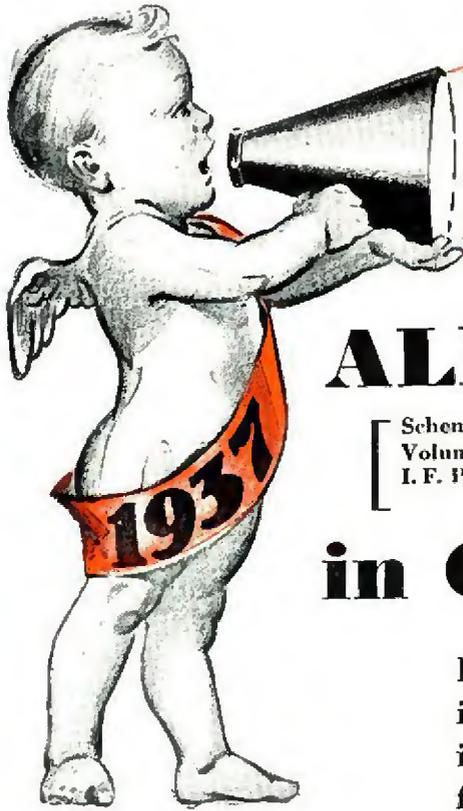
**MAGIC VOICE · MAGIC BRAIN · MAGIC EYE · METAL TUBES**



## RCA Victor

RCA MANUFACTURING COMPANY, INC., CAMDEN, NEW JERSEY  
A Service of the Radio Corporation of America





**Here's the Big News  
for 1937!!**

**ALL**

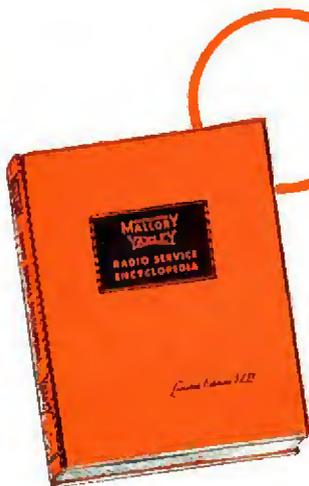
[ Schematics—Circuits      Condensers  
Volume Controls          Tubes  
I. F. Peak Frequencies      Vibrators  
Transformer Circuits ]

**in ONE book**

For the first time — under ONE Cover — all the information you need in servicing sets. Not only in *One* book but on *one* page, on *one* line, you find the answer for any servicing problem for any radio set. You bet! Over 12,000 different models are covered in this one compact, complete, authentic, up-to-the-minute compendium. The new

## MALLORY-YAXLEY

### Radio Service Encyclopedia



Over 200 pages of exact information. Bound in water-proof, washable cloth and printed on paper that stands the gaff... it is a permanent working reference.

They said it couldn't be done — that any one would be crazy to try it. But Mallory-Yaxley invested \$75,000 in hard cash and years of painstaking investigation; corralled the experience of thousands of practical servicemen. And we have achieved the impossible.

For the first time, accurate, detailed instructions are given on the thousands of receivers that ordinarily are headaches to the most experienced Service engineers. No need now to worry about the dope on the tough ones. This book gives the correct answer always. What's that worth to you? Boy, the sky is the limit.

We have prepared this Encyclopedia for you. Your Mallory-Yaxley distributor has your copy ready for you to examine. Your share of the cost is a trifle. Buy the book — if in a week it does not pay its way, if you would part with it for twice what you paid for it — return the book and get your money back. But act today; the edition is limited.

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# RADIO RETAILING

JANUARY, 1937

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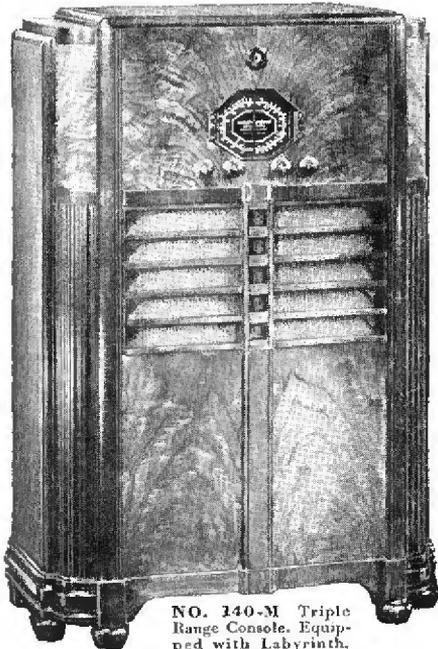
SALES STATIC . . . . "MY NEPHEW SAYS YOU SHOULD FIX THE FILTER TRANSFORMER"



IT'S THE MOST BEAUTIFUL RADIO I'VE EVER SEEN!

AND IT HAS THE LABYRINTH!

## Three Flashing NEW Stromberg-Carlsons TO START THE NEW YEAR



NO. 140-M Triple Range Console. Equipped with Labyrinth. Price, \$157.50

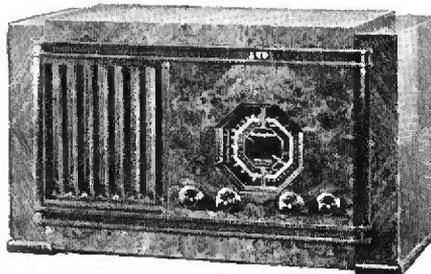


### Labyrinth RADIO

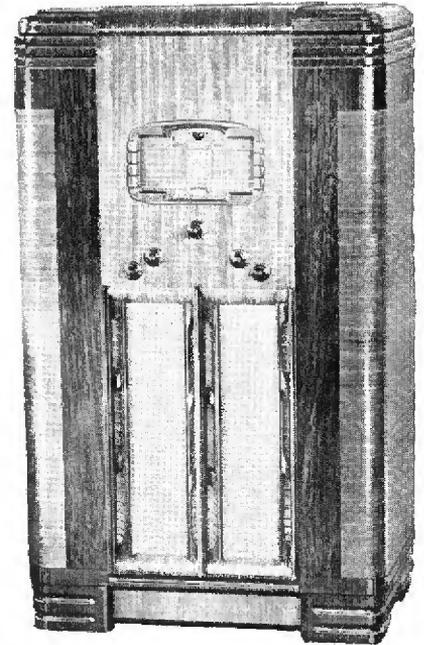
The long, winding passageway of the Acoustical Labyrinth takes the place of the usual box-like cavity in the cabinet which is the source of the exaggerated boom in low tones. It gives you deeper bass notes, with a new fidelity and increases the volume capacity and accuracy of the loud speaker.

HERE is an auspicious start for 1937 — three new, attention-getting Stromberg-Carlsons—radios that have everything the public wants. Here are two consoles, both with the sales-clinching Acoustical Labyrinth and Carpinchoe Leather Speaker, one a radio and automatic phonograph combination. Here also is a horizontal Treasure Chest model of genuine distinction.

Noteworthy in all three is the exclamation-arousing beauty of their cabinets. All have Tri-Focal Tuning, plus many other exclusive profit-building Stromberg-Carlson features. These new models prove conclusively that, for sales that count, "There is Nothing Finer Than a Stromberg-Carlson."



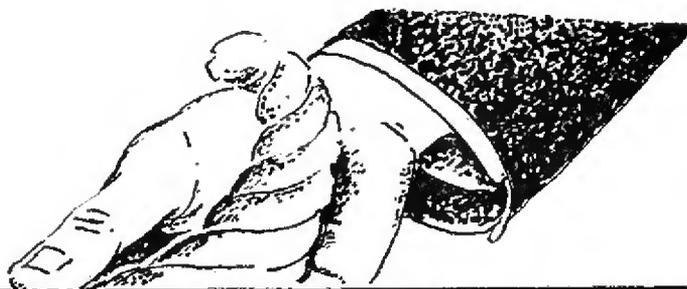
NO. 130-J TRIPLE RANGE TREASURE CHEST. Price . . \$87.50



NO. 145-SP FOUR RANGE RADIO AND AUTOMATIC PHONOGRAPH. Equipped with Labyrinth. Shifts and plays records of any standard make, either 10 or 12 inch. Plays both 33 $\frac{1}{3}$  and 78 r. p. m. records. Full-floating pickup mounting. Price . . . . . \$325

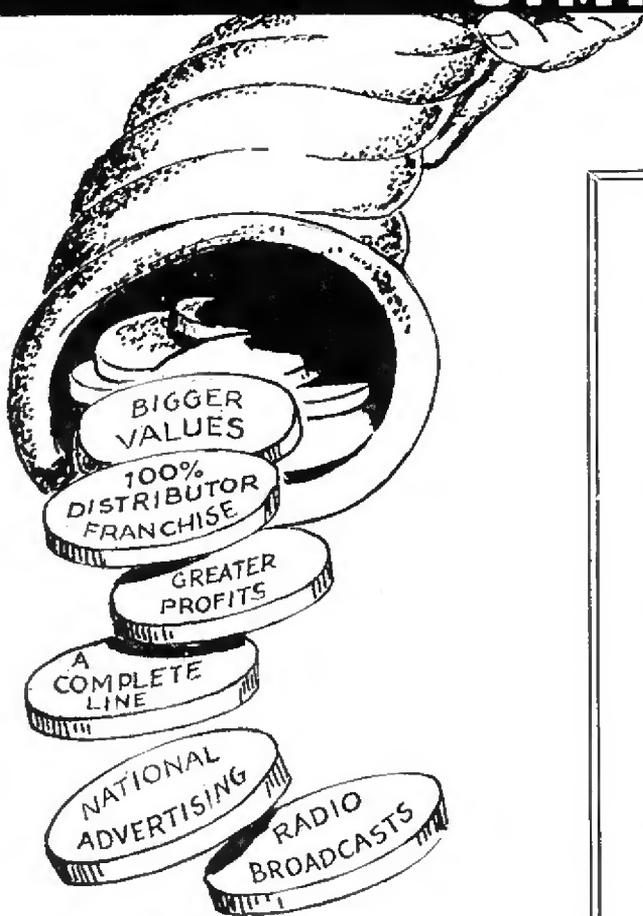
The complete line of Stromberg-Carlsons range in price from \$51.95 to \$985. (All prices slightly higher in Southeastern States and West of the Mississippi.)  
STROMBERG-CARLSON TELEPHONE MFG. CO.  
ROCHESTER, N. Y.

# Stromberg-Carlson



# THE COMPLETE **SIMPLEX** LINE FOR 1937

*Offers*



... everything any jobber or dealer could want

Smashing values are represented not only in the 5 LEADERS illustrated below but in the complete 1937 SIMPLEX Line of the table models and consoles.

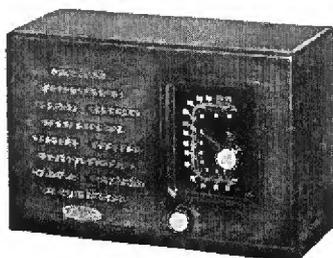
Every SIMPLEX receiver is a leader in its price class—sensational in performance, modern, beautifully styled from the one band T.R.F. model to the 11-tube, all-wave Superhet. 2, 6 or 32 volt models at proportionate prices. All models available for 2,000 meters—220 volt AC or AC-DC.

Under the NEW 1937 SIMPLEX JOBBER POLICY territories are absolutely protected because DISTRIBUTOR FRANCHISES are restricted to established Jobbers in large trade centers. Big profits, too, are assured through liberal Distributor Discounts.

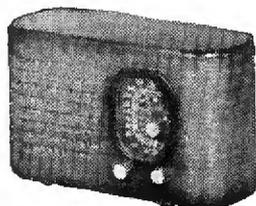
Extensive programs of National Advertising & Radio Broadcasting will create tremendous demands for SIMPLEX Receivers. Are you ready to cash in on the BIG BUSINESS that's already started to pour in for SIMPLEX JOBBERS and DEALERS?

Write, wire or phone for details of territories available, prices and discounts.

**THE SIMPLEX RADIO CO.**  
... FACTORY SANDUSKY, OHIO



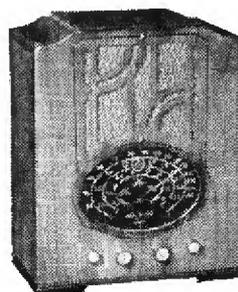
**\$12.25**  
4 Tube T.R.F.;  
1 Band



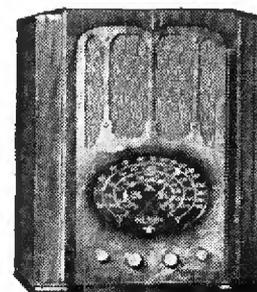
**\$19.95**  
6 Tube Super;  
2 Band



**\$27.45**  
7 Tube Super;  
2 Band



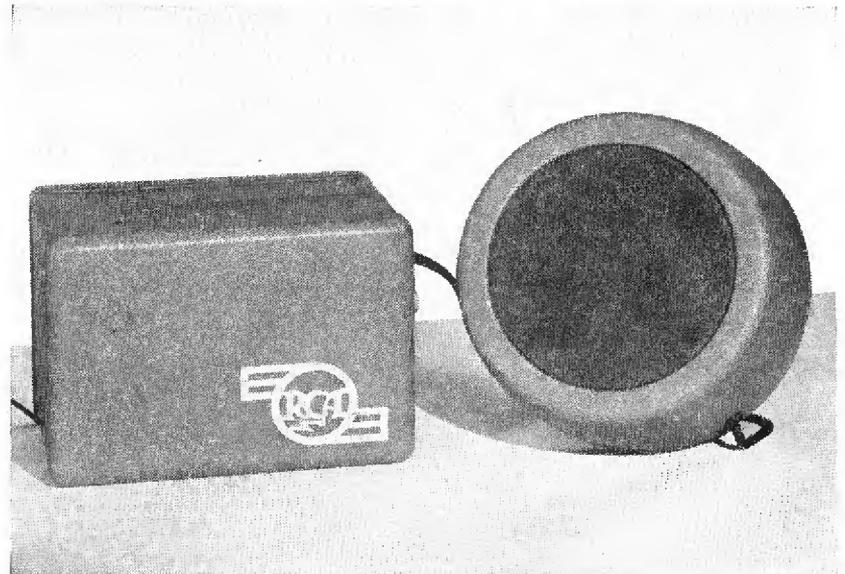
**\$36.95**  
9 Tube Super;  
3 Band



**\$49.95**  
11 Tube Super;  
3 Band

# NOW! *Magic Voice* in RCA Victor 1937 Auto Radio Line!

● Cash in! Push these new sets with great sales features . . . Magic Voice, Finger-Tip Control, Escutcheon Plates for 1934, '35, '36 and '37 cars. A unique merchandising plan and aggressive, compelling promotional advertising will help you.



● RCA Victor Magic Voice Model 67M-2 . . . 8-inch Magic Voice speaker, 6 tubes and Powertron, 9 watts output, 2 audio stages. Tone control and local-distant switch on control panel.

● RCA Victor Magic Voice Deluxe Model 67M-3 . . . 8-inch Magic Voice speaker, with auxiliary overhead speaker and three-way switch to select either or both speakers. 6 tubes and Powertron, 9 watts output, 2 audio stages.

. . . .

extra sales! Order your stock now. Feature these superb new sets. Push them at every opportunity. Cash in on real auto radio value!

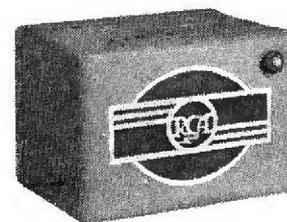
RCA Victor's 1937 automobile radios are made to order for easy and profitable selling by *you!* They bear radio's greatest name. They offer many features for finer performance. They are backed by a new, sales-inspiring merchandising plan!

Features? The famous RCA Victor Magic Voice makes its initial auto radio appearance—providing tone never before equalled in cars. Finger-tip control of *everything*. Escutcheon plates to match 1934, '35, '36, and '37 models. Two audio amplification stages. 9 watts output. And still others! For beauty, performance and tone—they're magnificent! And their low prices are an extra appeal that mean

● (Below) RCA Victor Model 67M-1 . . . 6 tubes and Powertron, 2 audio stages, 9 watts output, built-in speaker, connections for extra (overhead) speaker if desired.

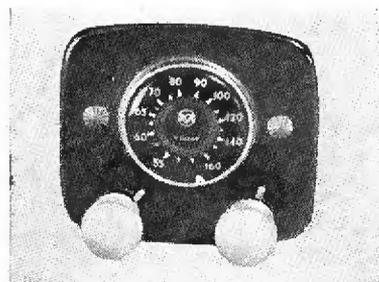


● (Above) RCA Victor Model 67M . . . 6 tubes, 3½ watts output. Outstanding performance at low price.



● 1937 RCA Victor Auto Radio escutcheon plates and controls to match instrument panel for cars, 1934 through 1937. Also available for steering post and under-dash mounting.

Tone and volume controls on left knob; tuning control and local-distant switch on right—for Magic Voice Models 67M-2 and 67M-3.



RCA presents the Metropolitan Opera every Saturday afternoon and "The Magic Key of RCA" every Sunday 2 to 3 P. M., E. S. T. Both via NBC Blue Network.

## *RCA Victor* AUTO RADIO



RCA MANUFACTURING COMPANY, INC., CAMDEN, N. J.

A Service of the Radio Corporation of America

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# RADIO RETAILING

JANUARY, 1937

O. FRED. ROST, Editor

## FAIR WEATHER AHEAD

FOR SAILORS OF OLD the ideal state at sea was to have fair weather and a fair wind. Then captains would order out every last stitch of canvas, studding sails would be set and the ship would cut through the water at record-breaking speed.

In the radio industry that ideal state of fair weather and a fair wind exists today.

On the weather question, all forecasters and expert economic prognosticators agree that 1937 will bring fair weather for all lines of business, radio included. The fair wind that in 1936 carried the radio industry to record-breaking set, tube and parts sales, is continuing unabated and so it is just a question of getting all sails set in order to take fullest possible advantage of those favorable conditions.

•

TO DO THIS, THE RADIO INDUSTRY must learn how to use some new sails that were not available in previous years.

The first of these is the Robinson-Patman Act. Although it has not yet undergone the crucible test of the courts, the majority of legal experts agree that it will be sustained. Its provisions should benefit the vast majority of small radio dealers against whom much discrimination has been practiced in the past.

Secondly, already 75 per cent of the members of the set division of the Radio Manufacturers Association have subscribed to the new Merchandising Reform Plan which is now in the hands of the Federal Trade Commission. Aside from declaring as "unfair"—and as such subject to F. T. C. prosecution—many practices that favored influential minorities, that plan

sounds the death knell of commercial bribery and thereby deprives the chiselers and dishonest traders of their advantage.

•

FINALLY THERE IS THE RECENT unanimous decision of the United States Supreme Court in which the fair trade laws of Illinois and California are declared constitutional. Those laws permit resale price-fixing under prescribed procedure. They vary but little from similar laws now on the statute books of 13 additional states and similar legislation is planned in others. The 15 states already protected accounted for 57 per cent of all the retail business done in this country. That means a majority of radio dealers will be able to obtain price and profit protection if the manufacturers provide the necessary set-up.

Collectively, those three new guides to business establish clearly understandable fair rules of competition and they provide the necessary tools and machinery for proper use and enforcement so that every member of the industry—manufacturers, distributors, dealers and salesmen—can take part in producing better, cleaner, more honest competitive conditions.

Wisely used, those new instrumentalities will act like studding sails and increase substantially the speed and stability of the ship. Used with malice and lack of understanding, they can do irreparable harm and retard progress.

It's fair weather and a fair wind.—We have a good ship and some new sails.—What 1937 will bring is up to us—the crew.

# First...WITH 1937 MODELS ...IN SELLING FEATURES

By Wire...By Mail...By Phone...They're Saying...

## "RUSH MORE 1937 STEWART-WARNERS"

WHY wait for new models—and sacrifice early-season profits—when the hottest line for 1937 is here *right now*? Other dealers are already going to town with the brand new 1937 Stewart-Warner—already clamoring for more *before* competing lines are even announced. Already Stewart-Warner's 1936 record of 127% sales gain is cracking wide open.

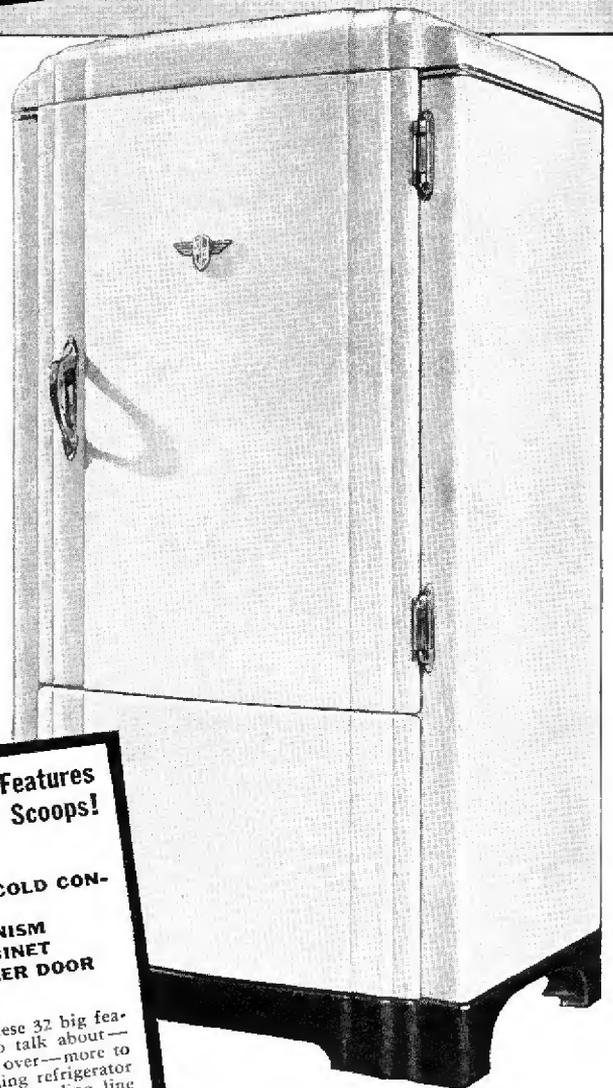
MORE FEATURES FOR YOUR MONEY is the reason. 32 real sales features! 6 marvelous, absolutely *exclusive* features topping the list! New eye appeal! And above all, the dependability and freedom from service that's made Stewart-Warner nationally famous. But sales appeal isn't all. Stewart-Warner puts you out in front with:

**1. New Floor Plan with No Finance Charges!** Under this new floor plan you can install a complete showing now without paying a penny in finance charges!

**2. Exclusive Retail Finance Plan!** You can feature "No Money Down" terms—and still have no repossession worries. Every Stewart-Warner sale is a cash sale for you. That's what it means to sell under the Stewart-Warner-C.I.T. 100% Advance and Non-Recourse Finance Plan.

**3. Powerful Selling Helps!** Horace Heidt and his famous brigadiers on a coast-to-coast network! Handsome, attention-compelling displays for your floor. Backgrounds—banners—booklets—folders! Everything you need to do a complete selling job!

Get full details from your Stewart-Warner distributor today!



### 32 Sales-Clinching Features Including 6 Exclusive Scoops!

1. NEW SAV-A-STEP
2. NEW SLID-A-TRAY
3. 16-POINT LIGHTED COLD CONTROL
4. SLO-CYCLE MECHANISM
5. VAPOR-SEALED CABINET
6. REVERSIBLE FREEZER DOOR

\* \* \*  
Stewart-Warner, with these 32 big features, gives you *more* to talk about—*more* to get enthusiastic over—*more* to SELL! It's the outstanding refrigerator buy for 1937 . . . the outstanding line for YOU!

**STEWART-WARNER Does It Again—  
With MORE FEATURES FOR YOUR MONEY!**

**IT'S NEW!  
SENSATIONAL!  
EXCLUSIVE!**

**DICTOGRAPH**

*Silent!*

**RADIO with the ACOUSTICON MYSTIC EAR**



**... and a welcome change from profitless selling**

**L**IKE the bursting of a bomb . . . news of the amazing Dictograph Silent Radio crashed home to listeners as the greatest innovation in a decade. It offers but one thing new . . . but that one thing so startling, so logical, so badly needed that every set owner is a prospect. It offers the only fundamental new feature in radio . . . the Acousticon Mystic Ear . . . that makes personalized listening possible, without earphones. One can listen, while others sleep, talk or read. It ends radio divorces . . . radio spats . . . radiositis! Thus, it banishes radio's last remaining negative factor.

The Acousticon Mystic Ear, exclusive with Dictograph Silent Radio, employs a sound principle new to radio. It is not an earphone, not a miniature loudspeaker. It employs the exclusive tonal fork principle, patent protected.

Dictograph Silent Radio dealers will cash in heavily on big national advertising NOW RUNNING. Get your share of these new profits. Fill in and mail the coupon TODAY for the whole profit-making story.

**DICTOGRAPH PRODUCTS CO., Inc.**

Radio Division Dept. E-1

**580 FIFTH AVE., NEW YORK, N. Y.**

**D**ICTOGRAPH PRODUCTS COMPANY, INC., are manufacturers of precision equipment for 34 years and make the Acousticon hearing aid, Dictograph Intracommunicating Systems for offices, the Detective Dictograph, the Limousine Dictograph, transmitting equipment for aircraft and army use, Packard Lektro-Shaver, International Ticket Seals, in addition to Dictograph Silent Radio.

The words "Silent" and "Acousticon Mystic Ear" are trade-marked. U. S. pats. No. 101,980 and 1,630,028; other pats. pending.

Copyright 1936 Dictograph Prod. Co., Inc.

**... 30,000,000 Radios  
and NONE Except Dictograph  
Offers the Acousticon Mystic Ear**

• You as a radio dealer, armed with the Dictograph Authorized Dealer Franchise, can go out and sell to a new and unscratched market. Not one of the 30,000,000 sets now in use provides the listener with personalized reception except the Dictograph Silent Radio. It is a full profit, non competitive, big demand opportunity that you should grasp . . . right now! Don't let this opportunity slip through your fingers. Someone is going to sell Dictograph Silent Radio with Acousticon Mystic Ear to YOUR customers and it should be you. Mail the coupon. Get on the bandwagon!

*A limited number of manufacturers are being considered for licensing arrangements for "Silent" Models with the Acousticon Mystic Ear.*

**MAIL IT!**

DICTOGRAPH PRODUCTS CO., INC.  
Radio Division, Dept. E-1  
580 Fifth Ave., New York, N. Y.

I want the full story of Dictograph Silent Radio and details of your Authorized Dealer Franchise Plan. Rush this information to me at once.

Your name .....

Firm name .....

Street .....

City .....

My distributor is.....

# *It's going to be a* **LONG, COLD WINTER**



## ***But not for the Dealers Who Sell Sylvania's!***

• There'll be more radios played in the U.S. this winter than ever before. That means more sets to service... more tubes to sell!

You can build a better all-around year-round, steady business with the *right kind of tube*. It pays to sell Sylvania!

Here's why: No kick-backs. You're protected and your custom-

ers are kept satisfied because Sylvania stands in back of every tube it makes. They're guaranteed, and tested eighty separate times before they leave the factory!

Fair list prices, also for your protection. Sales and technical aids from topnotch engineering and promotional departments. And ask any

man who sells Sylvania...twelve months a year. They'll tell you that Sylvania is playing ball with the dealer!

Get to know Sylvania NOW! You can get FREE...full technical and sales information by writing to the Hygrade Sylvania Corporation, Emporium, Pa.

# **SYLVANIA**

---

***THE SET-TESTED RADIO TUBE***

---

# January

1 9 3 7

## THE RADIO MONTH

### DON'T STOP NOW

Smart radio retailers use the momentum gained during the Christmas radio sales rush as the springboard from which to launch into a vigorous selling campaign on companion lines such as refrigerators, washing machines, vacuum cleaners, oil burners, stokers and other major appliances. They know the old theory about there being but little "money around" after the holidays long since has been out-moded. That thousands of prospects buy when well-timed selling forces action, and experience has demonstrated that January, February and March can be made to yield proportionately as large profits as any other month.

There are many desirable lines of companion appliances to choose from. Manufacturers have developed dealer cooperation to the highest possible point. It's just a matter of deciding whether to let yourself and your sales and service force do some expensive coasting during these months or whether to cash in with some extra sales and profits.

### SAD BUT TRUE

Some set manufacturers have been turning out sets at such a terrific pace that preliminary inspection of component units and post-assembly testing evidently was abandoned or so sadly slighted that distributors and dealers have had no end of trouble. We doubted the complaint made by one large dealer and he proceeded to prove his point by unpacking at random right then and there six of a lot of sets that had just been delivered. Three sets wouldn't work at all and the cabinet of another was so poorly finished that it had to be set aside.

Dealers can't afford to spend the time, effort and money involved in

rectifying gross negligence and no manufacturer can hope to hold the goodwill and continued cooperation of his dealers under such circumstances.

### A BIRTHDAY

Radio is 35 years old. It was on December 12th, 1901, that Marconi succeeded in sending the first wireless signal—three dots, for the letter "S"—across the Atlantic ocean from England to Newfoundland. After that it took twenty years to perfect voice transmission which made possible broadcasting and radio as we know it today. In other words, ours still is a young industry, in fact so young that its growing pains persist, but who can doubt that a prosperous future lies ahead, unless those within the industry fail of their duty.

### HIGHER PRICES

Things are going up. One prominent set-maker has raised prices from 4 to 6 percent in certain territories; another talks of a straight 10 percent increase, while some are making slight changes in existing models to cover up more-than-slight increases in price. With everything that goes into radio sets from 5 to 20 percent more expensive than it was six months ago, price boosts must be expected all along the line. This knowledge should be the tip-off for a special effort to sell tardy prospects by pointing out that they will save money if they buy now.

Tube lists, incidentally, rise approximately 11 per cent just as we go to press.

### GAS STATION STYME

In one of our largest cities a pair of ambitious boys have built up a local chain of neighborhood gasoline stations. They always handled various automobile accessories and when auto-

mobile radios became available they began selling them. They did a good job on auto-radios and where each of their stations had hundreds of regular customers, they decided to capitalize their "following" and reputation for good service by adding home radio sets to their line—and then their trouble began.

Regular radio dealers ganged up on them, exerted pressure on distributors and manufacturers until now those fellows can't buy any well known line of home radios although they can get all the auto radios they want.

### FAIR ENOUGH

"Premiums and bribes offered to the employer are at least as vicious and unfair as those given to the employee", says an Eastern set manufacturer, and then proceeds to point out that the new merchandising plan adopted by the set division of the Radio Manufacturers Association does not cover the employer part. He suggests that it's about time for all set makers to adopt a policy by which they announce certain list prices and discount schedules and then *stick to them* because manufacturers should not let chisellers thrive at the expense of those honest dealers who think that the openly quoted discounts are the limit price. He wants those new rules to put the chiselers out of business.

A  
HAPPY  
NEW YEAR



EDITOR

More than usual care in the preparation of quotas by manufacturers, plus close study of past performance and the potential market,\* indicates that there will be less dumping of distress stocks on the dealer's shoulders at the close of this year.

(\*See "Figures", beginning page 17)

# PLANS FOR 1937 PRODUCTION

**Crosley avoids excessive quota "pegs" . . .  
determines possibilities by counties . . .  
says highly saturated areas are still best**

**By Don Park** *Manager, Dealer Department, Crosley Radio Corporation*

**W**HAT are the possibilities for radio sales in your territory? Whether you are a distributor, a distributor's salesman, a dealer, or a dealer's salesman you should know just what your potential market for 1937 is.

You need a measuring stick to check your own sales performances.

You need a definite mark at which to shoot.

The manufacturer, too, must know the possibilities, not only as a basis for gauging performance, but as a basis for setting up new year production schedules.

The manufacturer wants to know how many sets each section of the

country can be expected to sell, and, in addition, when these sets can be sold.

If the manufacturer knows approximately what to expect in the way of sales each month, he does not become overstocked, consequently, does not have a large inventory to dump on the market later in the season, thus upsetting established distribution and starting a cut-price war. With careful planning and scientific forecasting this great evil of the radio industry may be greatly reduced.

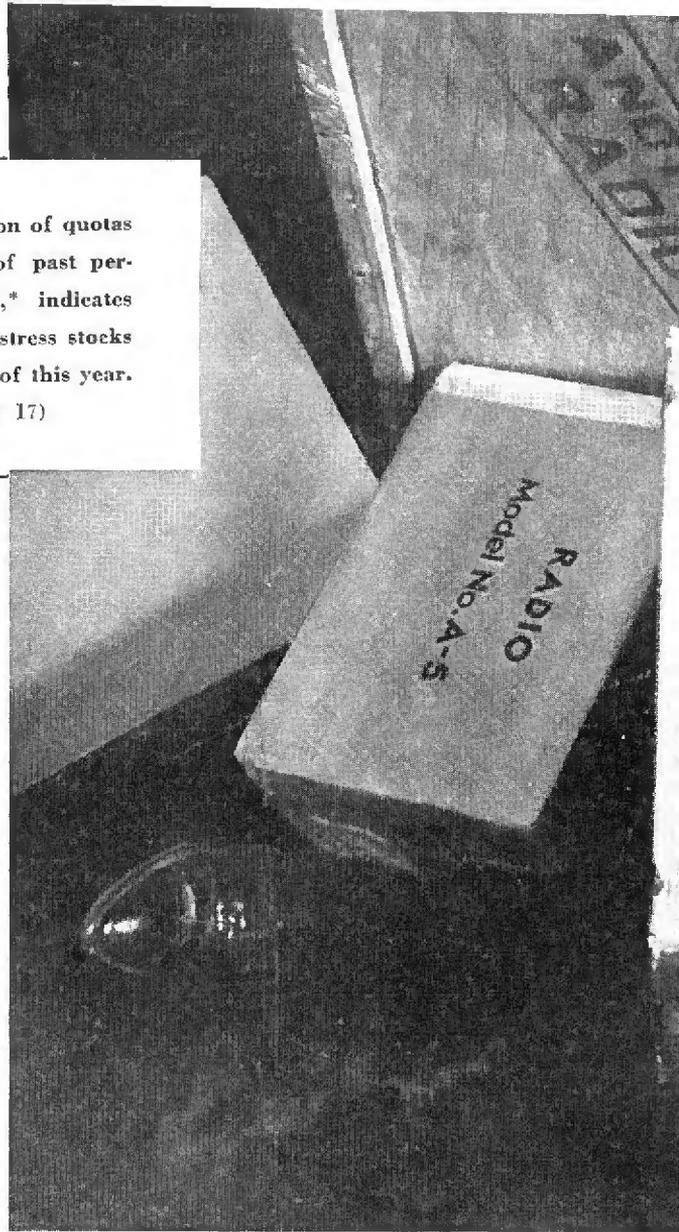
Regardless of all forecasting, there is a jump in the dark which any business has to make. Forecasting has to make that jump as short as possible. While it is true that forecasting still

involves some guesswork, it is nevertheless guesswork based on tangible facts, which gives it a reasonable degree of accuracy.

A large radio company, in setting up a quota, first makes an estimate of the total number of radio sets that it can reasonably expect to sell in the coming season. A comparison of the company's sales with the national sales of the industry indicates what percentage of the total is being obtained. Statistical procedure, known as the "Line of Least Squares" method, indicates, over a period of years, the growth element of the business. A line on a logarithmic chart will show, providing the same rate of increase is maintained, the total which the industry should reach the next year. The extension of the line on the basis of the growth element will indicate (if the same relative progress is being maintained by the company) what should reasonably be expected.

At this point the big company's executives examine general conditions by means of various forecasts. If, for example, the United States generally

*(Please turn to page 12)*





## Zenith manufactures against non-cancellable distributor orders . . . checks distributor sales weekly . . . aids distributors in slow sections

By Paul M. Bryant *Assistant to the President, Zenith Radio Corporation*

I AM glad to give readers of *Radio Retailing* an outline of the methods used by the Zenith Radio Corporation in establishing sales quotas and production control.

Our production is entirely controlled by the orders placed with us by our distributors. We manufacture sets only against non-cancellable orders. These orders must be in our hands at monthly intervals and from thirty days to five weeks in advance of delivery.

As a further control on production, we receive from each of our distributors a weekly report showing the number of sets sold by him the previous week, the number of sets in trans-

sit and the number of sets on hand. This information is broken down by models. We also receive a weekly report of the dealers franchised.

In addition to distributors' sales and inventory as above, we also keep a record of our own sales and inventories by models.

The combination of these figures clearly indicates the flow of sets by distributors and provides a weekly check on production of each model. For example, if we have 5,000 sets of any given model on hand and the distributors' inventories total another 5,000 sets and sales of this model are averaging 2,500 per week, we know that there is a total of four weeks'

supply available and govern our production accordingly.

Many other checks are made almost daily, such as price trends in public buying, but the system briefly outlined above represents the basic production control methods employed.

Electric set quotas for each distributor are based upon twenty-two factors, which are used as a gauge or par and then adjusted to meet economic, trade and competitive conditions in each territory.

### *Factory Helps In Slow Areas*

The weekly standing of each distributor is recorded on another form. This form shows the weekly and cumulative ranking of each distributor in comparison to all other distributors and his sales quota position for the previous weeks and period to date.

Each distributor is provided with a complete detailed breakdown of his sales quota by primary and secondary cities and rural towns by sets for each quarterly period. At the opening of the season he is also given dealer

*(Please turn to page 77)*

(Don Park)

expects a 10 per cent increase for the coming year and radio, according to its own statistical forecast, expects a 15 per cent increase—an average of 12½ per cent increase will probably not be very much out of line. It is true, of course, that unforeseen conditions such as wars, floods, strikes and panics, if these conditions are of wide scope, may affect the results.

When the executive of a business arrives at a reasonable forecast of the coming year his next step is to determine just what percentage of proportion of that total expectancy shall be given to each county.

#### ***"Saturated" Areas Still Buy Most***

It is necessary, therefore, that the company's statistician find out which factor figures can be used to determine what proportion of the total quota of expectancy shall be given to any one county. It is best, in order to avoid error, to use at least three factor figures.

For radio, one very important factor figure is the number of radio sets existing in each county in the United States. This can be reduced to a factor figure by finding what percentage radio ownership each county represents when applied against the United States total. This percentage factor is then applied against a total quota, to determine how many new sets, on the basis of radio absorption, that county should be accountable for.

Some opposition to this estimate may be voiced by those who feel that counties with 90 per cent of the absorption of radio sets, will not offer much of a market. Today, however, nearly 80 per cent of all the radio sets sold are replacements and an examination of the records indicates that a large percentage of the sales are still made in the counties which have the largest radio absorption. In the other counties, with a lower percentage of radio absorption, most people who do not have radio sets cannot afford them. Today, the desire for a radio set is universal.

The percentage of radio sets absorbed during the last ten years is a pretty good indication of what percentage individual counties will absorb of the total quota.

#### ***Local Income A Good Factor***

There are, however, other balancing factors which should be considered. For example: conditions may have changed to such an extent that while a county was prosperous and

absorbing all brands of radio sets two years ago, it is now poor and will probably not maintain its same percentage of absorption.

It is, therefore, a good plan to compare the spendable income figure with the radio absorption figure to get an indication of the present financial condition of the county. Spendable income figures for each county in the United States are prepared every year by a large statistical organization and the factor figure reflects such factors as bank deposits, money derived from rent and ownership, factory wages, income tax returns, telephones, passenger car owners, etc. The spendable income factor is derived from all these sources.

A third factor figure which is very good to use in the case of radio is general retail sales as reported by each county in the United States. This indicates whether the people in the county are spending their money. Naturally, a county where people are in the buying mood, is a pretty good county in which to sell more sets.

By comparing these three factor figures you may gauge with fair accuracy the possibilities for radio sales in each county. You have not, however, taken into consideration up to this point, what you have done in the county in the past.

#### ***Competitive Gains or Losses Important***

As every manufacturer knows, there are some counties which will show a special preference for one brand. In some localities your dealer is very excellent and the county produces much more than its normal expectancy. In other counties the dealer is all tied-up with competitive lines so that it is hard to do much. No competing dealer with the same merchandising ability may be available.

To get a correct picture of this situation the big manufacturer will take his last six or eight years of sales totaled by county, and he will then find what percentage each county has of the United States total.

Inasmuch as the picture in regard to the performance of the manufacturer in any county may change in the last year or so, it is advisable to weight the last two or three years by multiplying the sales for the last year by three, and the previous year by two. This gives triple weight to the previous years' performances.

Some manufacturers merely compare the factor figures with the last three years of sales.

Where sales have been consistently low but the possibilities as shown by

the factor figures indicate good possibilities, then the company is not obtaining its proper share of business from those counties. More sales and advertising effort should be put into these counties. Perhaps an investigation will indicate that other dealers must be secured, or it may be advisable to work more closely with existing dealers to improve their performance.

After the quota has been carefully figured in accordance with the best scientific procedure it is apt to be roundly criticized.

#### ***Deliberately Excessive "Pegs" Foolish***

If the quota is set at a figure which the management thinks is too low the statistician who figures it is often accused of being "crazy with the heat." If the same quota appears to the salesmen and to the distributor to be too high the statistician is likewise crazy with the heat.

The salesman is confident that he knows territorial conditions better than anyone in the home office, and the distributor feels that he knows his own territory and its possibilities. It is, therefore, necessary to "sell" the quota to the distributors and salesmen in the field.

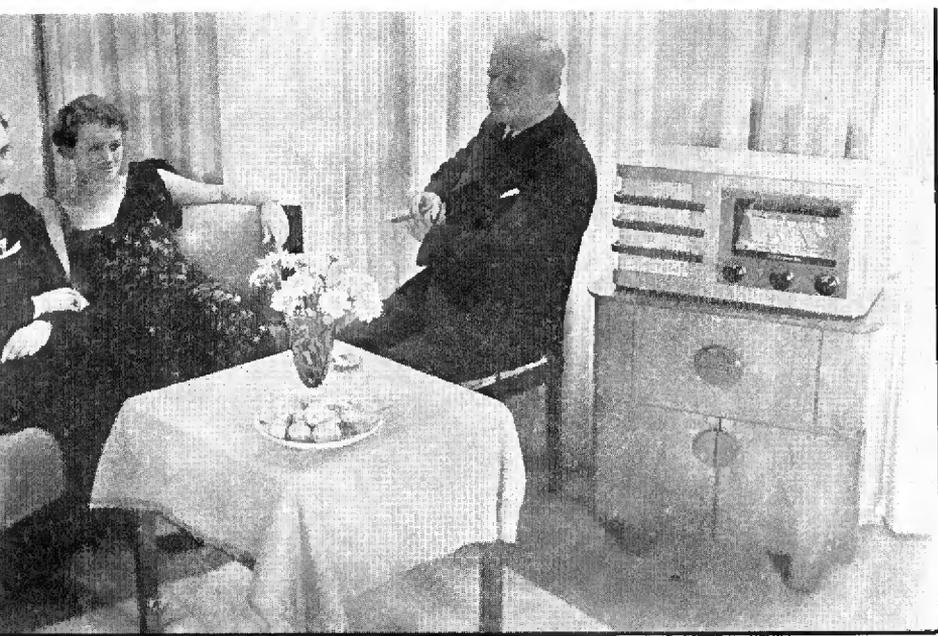
Some manufacturers arbitrarily set up the quota at too high a figure, on the assumption that if you ask for twice as much as you expect, you will come nearer reaching your goal. The experience of our own statistical department for the past several years has proven that this theory does not work out in practice. The minute you intimate to a salesman that you have purposely set the quota high, he immediately assumes that you will be satisfied with less. He cannot but feel that the quota is set unfairly, and with this feeling he cannot sell the quota to the distributor or be firm in his demands that the distributor make it.

Furthermore, if distributors make only a small percentage of the quota they lose a certain amount of enthusiasm which arises from coming near to the peg or going over it. This kind of quota causes them to work half-heartedly. A quota which a distributor or salesman can make is a quota which is inspirational.

#### ***Possible Quotas Best***

It is the best plan of quota procedure to set the quota at a reasonable expectancy figure and offer to the distributor or to the salesmen an incentive to make it. This plan has been most productive of results according

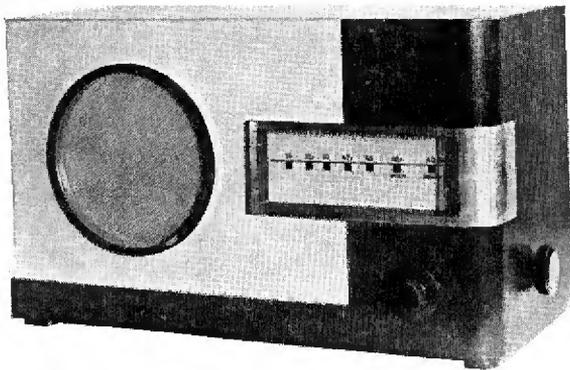
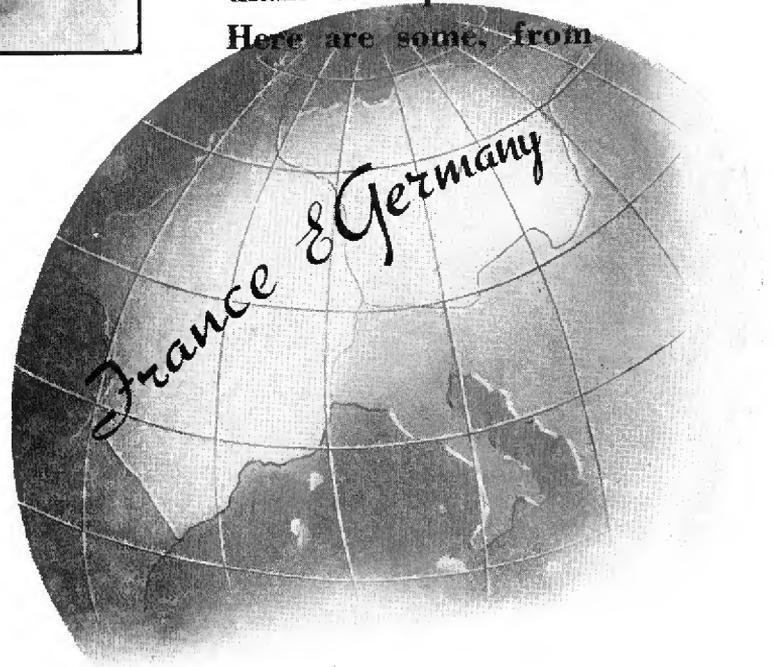
(Please turn to page 77)



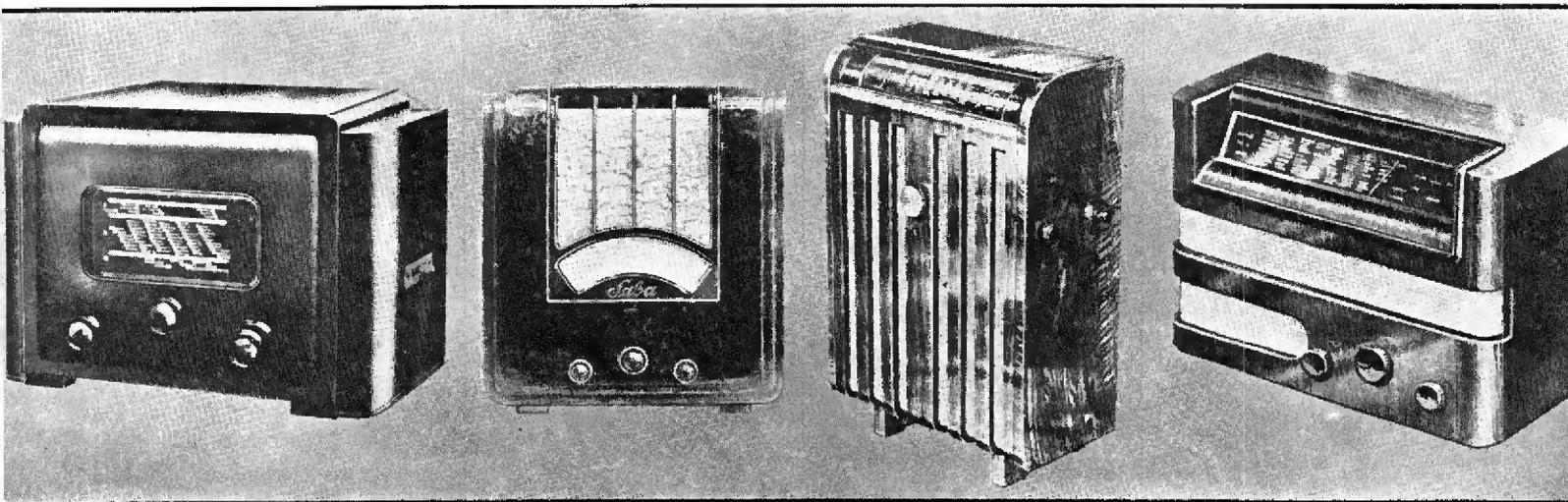
# FOREIGN FAVORITES

New cabinet ideas are the most effective stimulant to replacement. Here are some, from

**OAK FOR STRENGTH**—The dial of this light oak-encased receiver covers 60 per cent of the front. The cabinet beneath makes a splendid accessory for repeat business too



**PRACTICAL MODERNISM**—Two-tone wood and contrasting metal make this short-wave receiver stand apart. Note the extreme scale simplicity and control on side



**SIMPLICITY FOR FARMERS**—Here's a battery set with the number of controls reduced to the very minimum and the dial made extremely large. Speaker is at back

**BAKELITE BEAUTY**—Entirely moulded, this cabinet imitates Circassian walnut of the so-called root-pattern variety. The grille is a gold-brown silk

**EASY TO TUNE**—Large top edge scale plus controls on both front and side give this modernistic console both convenience and novelty

**NO MEAN DIAL**—Table models need not have miniature dials. Top edge tuning can be applied to small sets as well as to the larger consoles

# IT'S TURNOVER

**UNLESS** a manufacturer expects to do his own retail selling direct to the consumer, he must employ some independent outside agencies to do the job for him. Those agencies, the distributors, dealers and salesmen, must find that job profitable or they'll decide to take on some other manufacturer's line.

To make the job profitable for them requires that the manufacturer provide a combination of quality in the product, fairness in price and policy, promotion of public acceptance and sympathetic cooperation with each selling factor right down to the retail salesman. Given that combination of factors, the retailer will get a rate of turnover which enables him to chalk up a net profit. This will keep him the right kind of a dealer for the right kind of a manufacturer to do business with.

These are not the words used by Sayre M. Ramsdell, vice-president of the Philco Radio and Television Corp., but they represent approximately the philosophy that lies back of the type of planning that is characteristic of him.

## *What the Consumer Wants*

In the case of radio sets, he starts with the question of what the consumer wants, follows through all the steps of development, design, production and distribution to the point of final sale and yet keeps in mind constantly the final objective of making the retailer happy by giving him a line of goods that means fast turnover and good profits.

Ramsdell is somewhat of a stickler when it comes to giving the public what it wants. He says: "Philco has put a tremendous amount of thought, engineering skill and work into perfecting performance of its radios.

"We believe a radio set should fulfill all the expectations of the purchaser and all the manufacturer's claims for power, tone-quality, selectivity and sure, dependable foreign reception.

"We don't believe in deceiving the public and regardless of what other makers may make or claim, we don't put a single unit or a new gadget on our sets if it does not make them better."

How could any retailer, or for that matter, Mr. and Mrs. Consumer,

**SOMEWHERE** in every large organization is an official who, regardless of title, is the real top executive. This individual is not always recognized by the outside world as the standard-bearer because others may take the limelight and make the bows.

Not so at Philco, however. For if you ask J. M. Skinner, president of the Philadelphia Storage Battery Co. and Philco Radio and Television Corp. anything about the radio end of the business he tells you to see Ramsdell. Ramsdell is "the works."

So . . . meet Ramsdell.

As you will note from this informal picture he isn't always out selling sets. When he works, he works with such dynamic force that there is plenty of time left to play. In wintertime he is not averse to donning suitable togs and roughing it. In summer it's sailing, the kind that wants huge billows of white canvas above and enough of a breeze to keep the lee-rail awash.

**This is the fourth in a series of interviews with important industry executives by O. FRED. ROST**

take issue with or quarrel over such a clear declaration? Coming from the lips of Ramsdell it means that if he has his way, every single set he sells will meet the test he himself has outlined.

In fact, the assumption that the needs and demands of the public are completely fulfilled is more or less the springboard from which Ramsdell launched into his opinions and observations on the radio retailer's and salesman's place in the sun.

"We consider the retail dealer and salesmen the most potent factor. They are the men who contact the public, they are the ones who really put the product into the hands of the user.

"We consider them the mainspring of our whole merchandising structure, and we recognize this fact so thoroughly that we spare no effort to see our various problems through their eyes.

"That is why we have been able to give them an article that they can

# THAT COUNTS

## Profits Dwindle Unless the Dealer Has a Line that Moves Quickly



says

### Sayre M. Ramsdell

*Vice-President, Philco Radio and Television Corporation*

sell and sell rapidly, because obviously, if the article were not saleable, not in tune with the desires of their customers, they could not sell it."

And Ramsdell does not forget that the dealer must be set-up and satisfied with his profits so that he can give his salesmen a square deal, because:

"We recognize that the retail salesman is in business for himself just as much as the dealer, the wholesaler or the manufacturer, and that he is not only interested in making

an immediate sale to his customer, but that in reality he is building for himself, through the goodwill he creates, the prestige he commands and the personal following he develops."

#### *Advertising, Another Essential*

However, Ramsdell believes that, given a good set, and a good set-up, retailers also need to be backed up with the right kind of advertising and promotional activities if they are to get a profitable rate of turnover; and he reminds—

"We believe in backing the retail dealers and salesmen with a tremendous and consistent advertising program. We use display advertising in leading magazines, the newspapers throughout the country and in addition we have utilized our own medium—the radio, and we feel that by doing so we have built a valuable background for the operations of our dealers and the retail salesmen."

Thus, briefly stated, Ramsdell's formula by which retailers can get profitable turnover is—a first class set, an efficient and alert retailer, wide awake and well paid salesmen and then a bang-up advertising and publicity campaign to back up the outfit.

#### *5 to 7 Times*

Just how important this matter of turnover is to the retailer, Ramsdell illustrates by the following example:

"If a dealer has \$1000 to invest in merchandise and he takes on a well-known, fast-selling line of radio sets he can get a turnover of 5 to 7 times in a year, which, with the normal dealer's discounts on each turnover, would give him a profit of about \$4,900.

"If he scatters his \$1,000 on a lot of different makes, some of which he could turn only two or three times in the year, he would reduce his profits greatly."

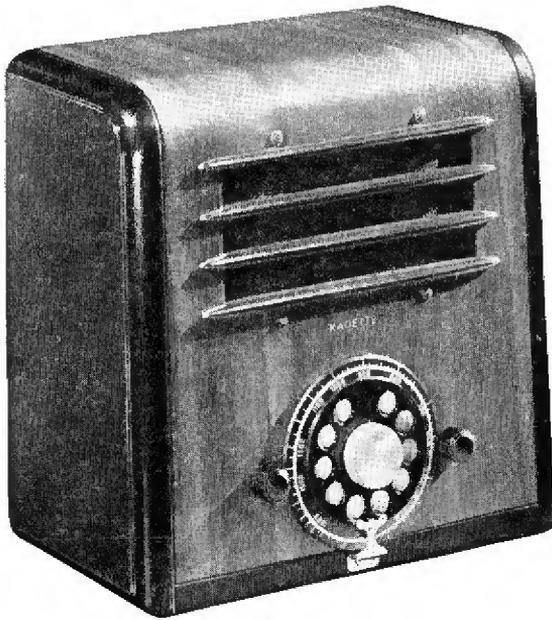
In other words, Ramsdell feels that the best rate of turnover can be obtained by concentration of effort, and he took this opportunity to remind that his company believes in taking its own medicine saying:

"We work on the simple, common-sense principle that year-round success lies in a fast year-round concentrated business and that is why we concentrate every ounce of effort and every minute of time on developing the design, the advertising and the marketing of just one product:—Radio."

Finally, Ramsdell summed up his attitude toward radio dealers and salesmen in these words:

"I feel that the retail dealers and salesmen are the ones who have kept the wheels of our industry going. I give the credit to them for having moved more than eight million of our sets and I think one of the reasons for their continuing support is that we have made sure that they would get a fast rate of turnover."

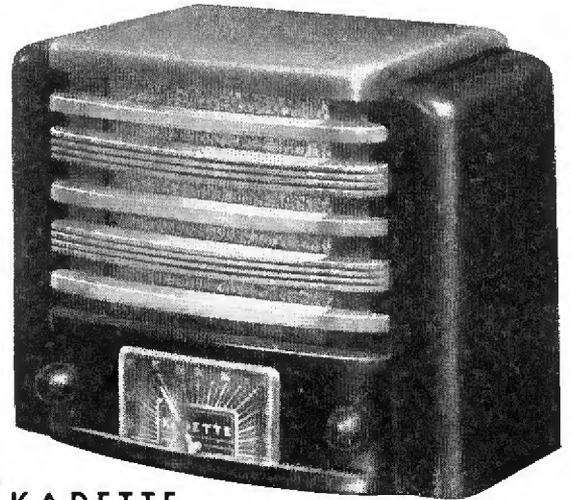
# MAKE THESE YOUR 1937 LEADERS!



The  
**KADETTE  
MODEL 35**

Lowest-priced radio on the market with the new telephone-type dial tuning. Tunes by inserting finger tip in desired opening and twirling dial to stop plate at bottom. Complete broadcast and upper police bands.

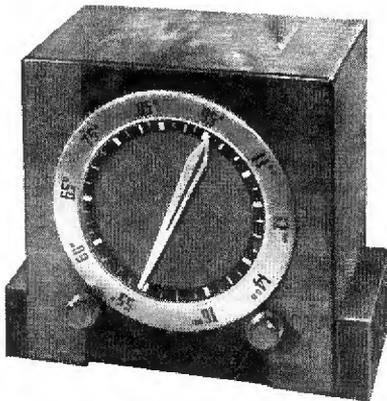
**\$24<sup>95</sup>**  
COMPLETE



The  
**KADETTE**

*Classic*  
**\$29<sup>50</sup>**  
COMPLETE

The "Classic" introduces a radio of superlative design—just as beautiful front or back, and incorporating for the first time, three different colored plastics—seven models in distinctive color combinations.

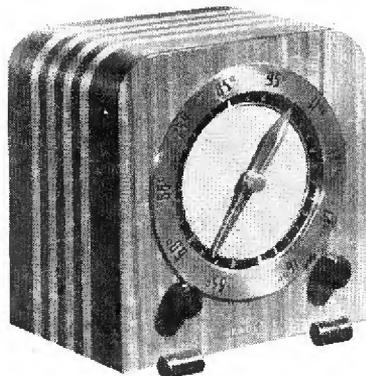


The **MODERN**

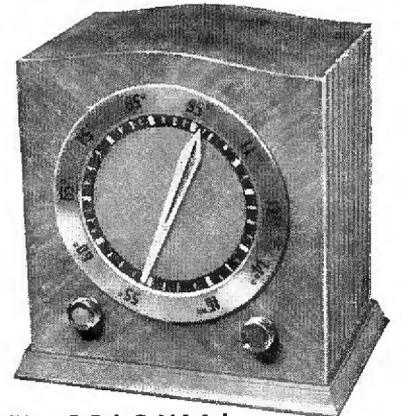
The  
**KADETTE** *Clockette*

The "Clockette" sells on sight! A great little set, exceptional tone, highly selective. And there's nothing like it in appearance on the market.

**\$19<sup>95</sup>**  
COMPLETE



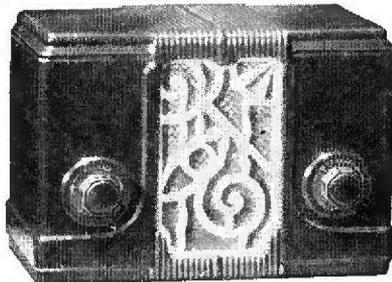
The **FUTURA**



The **COLONIAL**

The "Modern," the "Futura" and the "Colonial" styles—cabinets of choice walnut and maple veneers—large clock-type dials combined with speaker grille—5 tubes in half the usual space.

PATENTS  
APPLIED FOR



The  
**KADETTE** *Jewel*

The "Kadette Jewel" has been a sales sensation from the minute of its introduction—and it is selling faster now than ever before at the new \$10.00 to \$12.50 price. Comes in choice of colors—marvelous tone—make it your value leader.

**\$10<sup>00</sup>**  
COMPLETE

## KADETTE

Stock all of these out-of-the-ordinary radios and cash in on the big volume of profitable business they'll bring you.

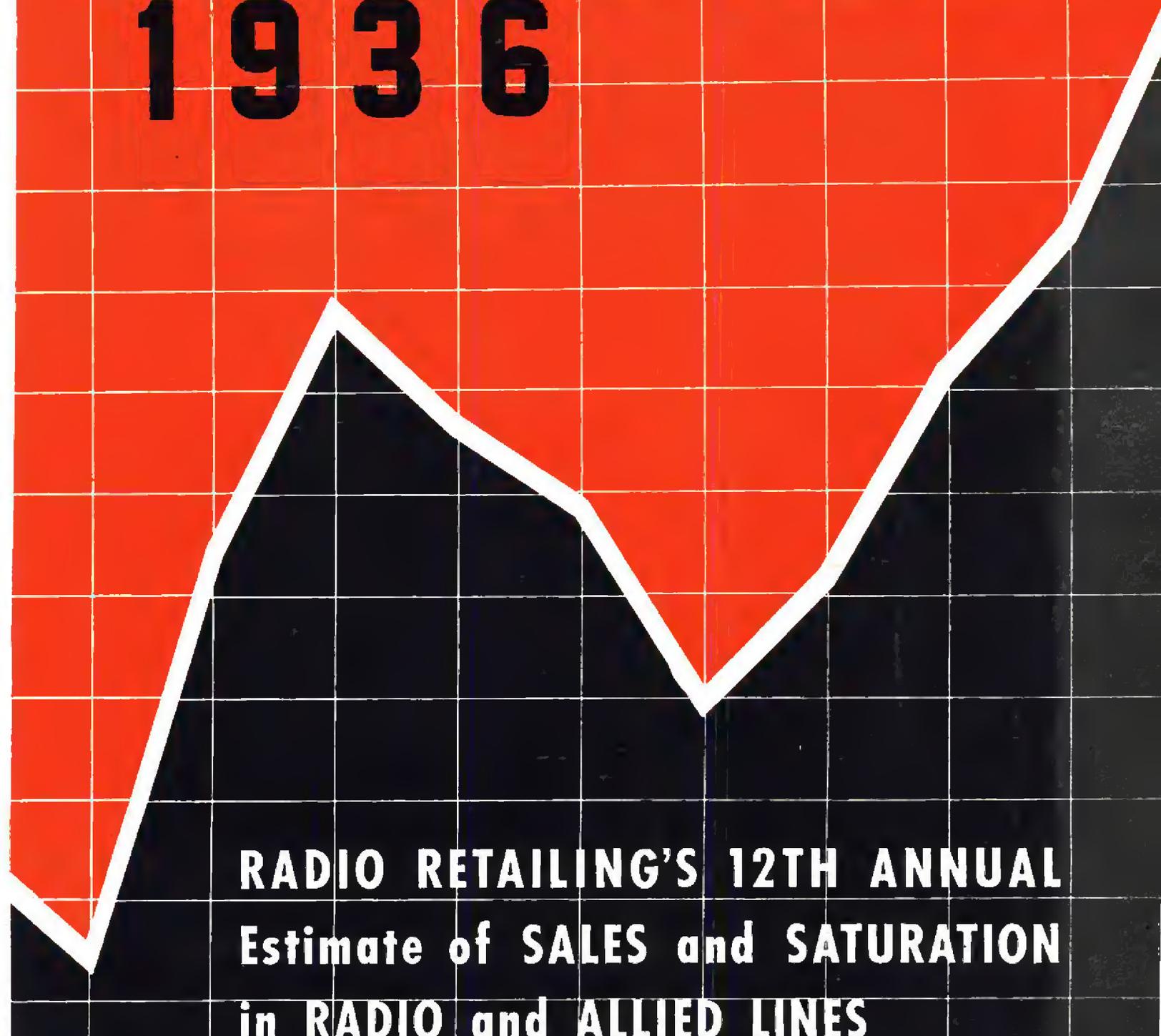
**ORDER NOW**

INTERNATIONAL RADIO CORPORATION  
526 WILLIAMS STREET ANN ARBOR, MICHIGAN

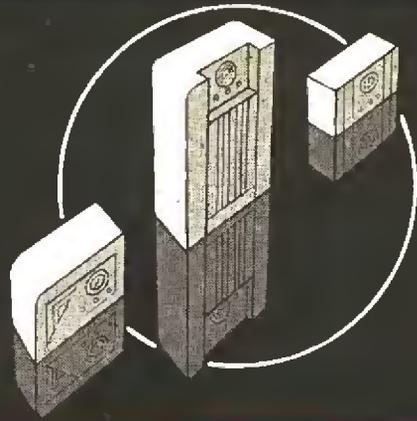
*Creators of Quality Compacts*

# FIGURES...

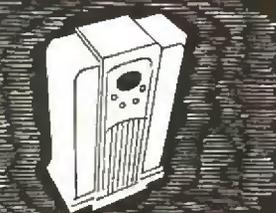
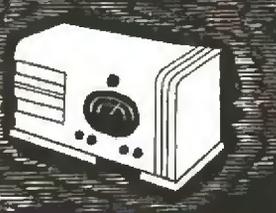
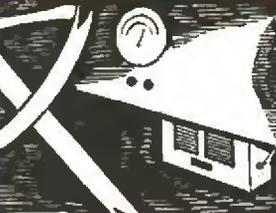
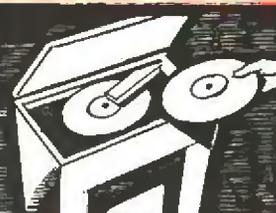
## 1936



**RADIO RETAILING'S 12TH ANNUAL  
Estimate of SALES and SATURATION  
in RADIO and ALLIED LINES**

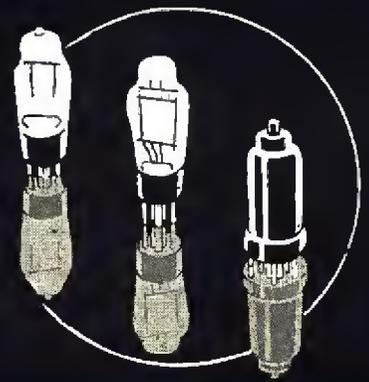


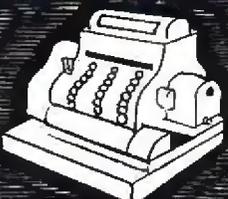
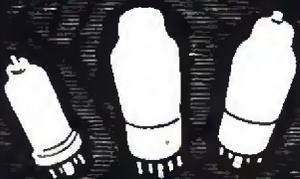
# SETS

		1935	1936
	<b>TOTAL SALES</b> <small>(Including Export)</small>		
	<b>Units</b>	6,106,800	8,825,000
	<b>Dollars</b> <small>(At Retail)</small>	\$301,192,480 <small>(Average, \$49)</small>	\$503,025,000 <small>(Average, \$57)</small>
	<b>CONSOLES</b>		
	<b>Units</b>	2,037,556 (33%)	3,353,500 (38%)
	<b>Dollars</b>	\$139,165,074 (46%) <small>(Average, \$68)</small>	\$257,778,250 (51%) <small>(Average, \$77)</small>
	<b>TABLE MODELS</b>		
	<b>Units</b>	2,944,244 (48%)	3,971,250 (45%)
	<b>Dollars</b>	\$107,464,906 (36%) <small>(Average, \$36)</small>	\$162,821,250 (32%) <small>(Average, \$41)</small>
	<b>AUTO RADIOS</b>		
	<b>Units</b>	1,125,000 (19%)	1,412,000 (16%)
	<b>Dollars</b>	\$54,562,500 (18%) <small>(Average, \$48)</small>	\$69,188,000 (14%) <small>(Average, \$49)</small>
	<b>COMBINATIONS</b>		
	<b>Units</b>	(Included in Consoles)	88,250 (1%)
	<b>Dollars</b>		\$13,237,500 (3%) <small>(Average, \$150)</small>

**BATTERY SET SALES, 1936—790,000 Units**

# TUBES



		1935	1936						
	<b>TOTAL RECEIVING TYPE SALES</b> (Including Export)  Units	75,961,500	105,600,000						
	<b>SALES TO MANUFACTURERS</b> (Radio and Allied Lines)  Units	32,577,000 (43%)	49,632,000 (47%)						
	<b>REPLACEMENT &amp; EXPERIMENTAL SALES</b>  Units	43,384,500 (57%)	55,968,000 (53%)						
	<b>REPLACEMENT &amp; EXPERIMENTAL SALES</b>  Dollars (At Retail)	\$28,633,770 (Average, 66c)	\$38,058,240 (Average, 68c)						
	<b>SALES BY TYPES</b> (To Mfrs. and for Replace.)  Units		<table border="1"> <thead> <tr> <th>GLASS</th> <th>METAL</th> <th>"G"</th> </tr> </thead> <tbody> <tr> <td>66%</td> <td>26%</td> <td>8%</td> </tr> </tbody> </table>	GLASS	METAL	"G"	66%	26%	8%
GLASS	METAL	"G"							
66%	26%	8%							

PERCENTAGES SHOWN APPLY IN ALL CASES TO TOTAL SALES

**RADIO**



## PARTS



## ACCESSORIES



## TESTERS

### Replacement Condensers

Dollars . . . \$1,800,000  
(At Mfrs. S.P.)

### Replacement Controls

Dollars . . . . \$900,000  
(At Mfrs. S.P.)

### Replacement Resistors

Dollars . . . . \$850,000  
(At Mfrs. S.P.)

### Replacement Transformers

Dollars . . . \$1,500,000  
(At Mfrs. S.P.)

### Replacement Vibrators

Dollars . . . . \$850,000  
(At Mfrs. S.P.)

### Replacement Speakers

Dollars . . . . \$275,000  
(At Mfrs. S.P.)

### Radio "B" Battery Sales

Units . . . . 7,500,000  
Dollars . . \$10,125,000  
(At Retail)

### Radio "C" Battery Sales

Units . . . . 2,600,000  
Dollars . . . \$936,000  
(At Retail)

### Wind-Driven Charger Sales

Units . . . . . 250,000  
Dollars . . \$5,500,000  
(At Retail)

### Gas-Driven Charger Sales

(Primarily for Radio Use)

Units . . . . . 25,000  
Dollars . . \$1,500,000  
(At Retail)

### Total Sales

### Radio Service Instruments

Dollars  
(At Retail)

\$3,900,000

### Average Prices:

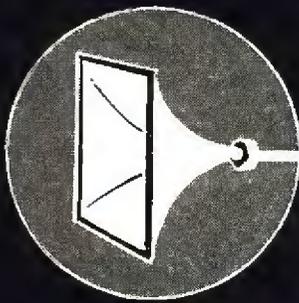
Analyzers . . . . \$60

Tube Checkers . \$33

Oscillators . . . \$37

Ohmmeters . . . \$18

Oscillographs . . \$89



## SOUND



## RECORDS



## APPLIANCES

### Total Sales

#### Complete Sound Systems

Dollars

(At Retail)

\$5,250,000

#### Breakdown By Types:

##### Portable and Mobile

Dollars . . \$3,000,000

##### Large Fixed and Centralized

Dollars . . . \$1,650,000

##### Interoffice Communication

Dollars . . . . \$600,000

### Total Sales

Units

32,000,000

### Total Sales

Dollars

(At Retail)

\$15,000,000

#### Popular Disc Sales

Dollars

74%

#### Classical Disc Sales

Dollars

26%

### REFRIGERATORS

1935

1936

Units

1,568,800

2,000,000

Dollars (At Retail)

\$260,420,800  
(Average, \$165)

\$328,000,000  
(Average, \$164)

### WASHERS

Units

1,228,774

1,533,300

Dollars (At Retail)

\$79,931,748  
(Average, \$65)

\$101,259,132  
(Average, \$66)

### IRONERS

Units

143,856

178,000

Dollars (At Retail)

\$7,860,291  
(Average, \$54)

\$10,252,800  
(Average, \$57)

### CLEANERS

Units

906,049

1,146,151

Dollars (At Retail)

\$50,439,748  
(Average, \$55)

\$62,178,692  
(Average, \$54)

# SATURATION

STATE	1936 Families	RADIO HOMES		WIRED HOMES	
		Radio Homes Jan. 1, 1937	% Radio Homes	Wired Homes Jan. 1, 1937	% Wired Homes
Maine	211,662	174,660	82.52%	167,224	79.01%
New Hampshire	130,256	108,240	83.10	114,212	87.68
Vermont	94,292	78,720	83.48	70,859	75.15
Massachusetts	1,063,702	1,018,440	95.74	1,069,535*	100.00
Rhode Island	163,701	159,900	97.68	170,143*	100.00
Connecticut	419,854	400,980	95.50	431,953*	100.00
<b>NEW ENGLAND</b>	<b>2,083,467</b>	<b>1,940,940</b>	<b>93.16</b>	<b>2,023,926</b>	<b>97.14</b>
New York	3,241,854	3,198,000	98.64	3,143,696	96.97
New Jersey	1,055,609	964,320	91.35	998,493	94.59
Pennsylvania	2,357,209	2,081,160	88.29	1,906,103	80.86
<b>MIDDLE ATLANTIC</b>	<b>6,654,672</b>	<b>6,243,480</b>	<b>93.82</b>	<b>6,048,292</b>	<b>90.89</b>
Ohio	1,716,898	1,488,300	86.68	1,458,481	84.95
Indiana	900,781	661,740	73.46	616,676	68.46
Illinois	1,986,076	1,788,420	90.05	1,629,838	82.06
Michigan	1,166,585	1,023,360	87.72	993,568	85.17
Wisconsin	705,825	615,000	87.13	574,681	81.42
<b>EAST NORTH CENTRAL</b>	<b>6,476,166</b>	<b>6,676,820</b>	<b>86.11</b>	<b>5,273,244</b>	<b>81.43</b>
Minnesota	624,407	573,180	91.79	426,044	68.23
Iowa	655,412	538,740	82.19	408,594	62.34
Missouri	1,025,647	762,600	74.35	590,022	57.53
North Dakota	149,893	105,780	70.57	56,135	37.45
South Dakota	160,930	116,620	71.84	69,036	42.90
Nebraska	340,150	285,360	83.89	204,359	60.08
Kansas	488,601	378,840	77.54	287,289	58.80
<b>WEST NORTH CENTRAL</b>	<b>3,445,040</b>	<b>2,760,120</b>	<b>80.12</b>	<b>2,041,479</b>	<b>59.26</b>
Delaware	64,268	49,200	76.55	43,320	67.42
Maryland	395,744	341,940	86.40	462,154	83.17
District of Columbia	159,948	140,220	87.66		
Virginia	584,463	364,080	62.29	249,677	42.72
West Virginia	396,173	258,300	65.21	183,155	46.24
North Carolina	702,642	369,000	52.51	266,742	37.96
South Carolina	391,679	172,200	43.97	106,394	27.17
Georgia	687,640	324,720	47.22	204,639	29.76
Florida	421,025	253,380	60.18	243,468	57.83
<b>SOUTH ATLANTIC</b>	<b>3,803,412</b>	<b>2,273,040</b>	<b>59.76</b>	<b>1,769,669</b>	<b>46.26</b>
Kentucky	672,028	339,430	50.51	247,485	36.83
Tennessee	658,390	346,860	52.68	229,677	34.87
Alabama	640,716	277,980	43.38	168,326	26.27
Mississippi	471,361	182,040	38.62	79,515	16.87
<b>EAST SOUTH CENTRAL</b>	<b>2,442,496</b>	<b>1,146,360</b>	<b>46.93</b>	<b>724,903</b>	<b>29.68</b>
Arkansas	479,383	201,720	42.08	96,981	20.23
Louisiana	491,203	277,980	56.59	187,937	38.26
Oklahoma	596,226	359,160	60.24	231,230	38.78
Texas	1,449,526	924,960	63.81	623,308	43.00
<b>WEST SOUTH CENTRAL</b>	<b>3,016,338</b>	<b>1,763,820</b>	<b>58.47</b>	<b>1,139,456</b>	<b>37.78</b>
Montana	134,771	98,400	73.01	81,125	60.19
Idaho	118,004	81,180	68.79	79,692	67.53
Wyoming	58,838	49,200	83.62	30,065	51.08
Colorado	276,452	221,400	80.37	173,443	62.97
New Mexico	98,368	54,120	55.01	26,968	27.42
Arizona	98,783	68,880	69.73	59,854	60.59
Utah	117,808	91,020	77.26	103,939	88.23
Nevada	28,011	24,600	87.82	19,208	68.57
<b>MOUNTAIN</b>	<b>930,035</b>	<b>688,800</b>	<b>74.06</b>	<b>574,284</b>	<b>61.75</b>
Washington	446,467	371,460	83.20	393,861	88.22
Oregon	284,078	231,240	81.40	218,577	76.94
California	1,721,306	1,603,920	93.18	1,690,193	98.19
<b>PACIFIC</b>	<b>2,451,851</b>	<b>2,206,620</b>	<b>90.00</b>	<b>2,302,631</b>	<b>93.91</b>
<b>TOTAL U. S.</b>	<b>31,303,475</b>	<b>24,600,000</b>	<b>78.58</b>	<b>21,887,774</b>	<b>69.92</b>
	1936 Families	Radio Homes Jan. 1, 1937	% Radio Homes	Wired Homes Jan. 1, 1937	% Wired Homes

NOTE A

NOTE B

NOTE C

NOTE A.—Based on 1936 government population figures by states are not available so the total of 1,731,000 figure, obtained by national survey on January 1, 1936



### FARM HOMES

Total Farm Homes	Wired Farms Jan. 1, 1937	% Wired Farms
39,006	14,852	38.08%
14,906	11,875	79.67
24,898	3,191	32.90
25,598	21,000	82.04
3,322	2,779	83.65
17,195	18,341*	100.00
124,925	77,088	61.67
159,806	69,182	43.29
25,378	15,466	60.94
172,419	56,860	32.98
357,603	141,508	39.57
219,296	59,976	27.35
181,070	31,794	17.51
214,497	34,313	15.00
169,372	62,378	36.83
181,767	42,578	23.92
966,802	231,219	23.92
185,255	14,275	7.70
214,928	33,819	15.73
255,940	19,762	7.72
77,975	2,061	2.63
83,157	2,957	3.55
129,486	10,830	8.36
166,042	14,793	8.91
1,112,756	98,577	8.85
9,707	1,876	19.32
43,307	8,560	19.76
170,610	17,496	10.25
82,641	7,972	9.65
279,708	13,301	4.76
157,931	5,623	3.56
255,898	7,437	2.91
58,966	7,776	13.18
1,058,468	70,040	6.62
246,499	9,298	3.77
245,657	13,020	5.30
257,395	14,176	5.50
312,563	3,662	1.16
1,062,214	40,116	3.78
242,334	4,269	1.76
161,445	3,990	2.47
203,866	6,418	3.15
495,489	16,221	3.27
1,103,134	30,898	2.80
47,495	3,262	6.87
41,674	16,362	39.26
16,011	572	3.57
59,956	7,687	12.82
31,404	1,900	6.05
14,173	5,931	41.85
27,159	18,217	67.07
3,442	991	28.79
241,314	54,923	22.76
70,904	41,170	58.06
55,153	20,337	36.87
135,576	92,148	67.92
261,733	153,655	58.71
6,286,648	897,873	14.28
Total Farm Homes	Wired Farms Jan. 1, 1937	% Wired Farms

NOTE D

### AUTOMOBILES

Passenger Car Registrations, 1936	% Auto Registrations to Families
149,000	70.39%
97,760	75.04
75,000	79.54
742,855	69.83
142,219	86.88
342,000	81.45
1,548,824	74.34
2,107,017	64.99
811,456	76.87
1,656,079	69.41
4,554,552	68.44
1,600,000	93.19
761,228	84.51
1,475,000	74.26
1,237,832	+100.00
668,800	94.75
5,742,860	88.67
667,712	+100.00
650,000	99.17
575,000	65.81
137,500	91.73
159,000	98.80
352,000	+100.00
490,327	+100.00
3,131,539	90.90
49,700	77.33
503,835	90.67
349,522	59.80
220,409	55.64
423,770	60.31
229,000	58.48
337,916	49.14
317,819	75.48
2,431,971	63.94
314,500	46.80
318,000	48.30
250,000	39.02
158,817	33.69
1,041,317	42.63
173,588	36.21
228,000	46.41
452,400	75.87
1,170,000	80.71
2,023,988	67.10
128,069	95.03
103,527	87.73
61,500	+100.00
277,765	+100.00
85,250	86.55
96,596	97.78
102,000	86.58
30,821	+100.00
885,528	95.21
420,370	94.15
277,229	97.59
2,115,526	+100.00
2,813,125	+100.00
24,173,704	77.22
Passenger Car Registrations, 1936	% Auto Registrations to Families

NOTE E

### STATE

Maine
New Hampshire
Vermont
Massachusetts
Rhode Island
Connecticut
NEW ENGLAND
New York
New Jersey
Pennsylvania
MIDDLE ATLANTIC
Ohio
Indiana
Illinois
Michigan
Wisconsin
EAST NORTH CENTRAL
Minnesota
Iowa
Missouri
North Dakota
South Dakota
Nebraska
Kansas
WEST NORTH CENTRAL
Delaware
Maryland
District of Columbia
Virginia
West Virginia
North Carolina
South Carolina
Georgia
Florida
SOUTH ATLANTIC
Kentucky
Tennessee
Alabama
Mississippi
EAST SOUTH CENTRAL
Arkansas
Louisiana
Oklahoma
Texas
WEST SOUTH CENTRAL
Montana
Idaho
Wyoming
Colorado
New Mexico
Arizona
Utah
Nevada
MOUNTAIN
Washington
Oregon
California
PACIFIC
TOTAL U. S.



## DISTRIBUTION



## BROADCASTING



## GENERAL

### DISTRIBUTOR SET SALES BY MONTHS

January	9%
February	6%
March	5%
April	4%
May	2%
June	5%
July	4%
August	8%
September	12%
October	14%
November	15%
December	16%

### DISTRIBUTOR PARTS SALES BY MONTHS

January	9%
February	7%
March	7%
April	7%
May	6%
June	6%
July	7%
August	8%
September	10%
October	11%
November	11%
December	11%

### 1936 Total Time Sales

Dollars . . \$105,700,000  
(20.8% Increase)

Chain	\$60,300,000
Non-Chain	\$45,400,000

### 1935 Total Time Sales

Dollars . . \$87,523,938

Chain	\$51,178,425
Non-Chain	\$36,345,513

### Sponsored vs. Sustaining Time

NBC	Spon.	Sust.
	(Entire Day)	26.4% 73.6%

COLUMBIA	Spon.	Sust.
	(9 am. to 11 pm. only)	45.0% 55.0%

MUTUAL	Spon.	Sust.
	(9 am. to 12 mid. only)	28.5% 71.5%

### TOTAL CAPITAL INVESTMENT IN U. S. BROADCAST STATIONS

(Exclusive of Real Estate)

Dollars . . . \$19,300,000

### TOTAL ANNUAL MAINTENANCE COST OF U. S. BROADCAST STATIONS

(Inc. Interest On Invest., Depreciation)

Dollars . . . \$20,001,000

### TOTAL U. S. BROADCAST STATION PERSONNEL

(Inc. Sustaining Program Artists)

13,500

**RADIO  
RETAILING**

## EXPORTS

		1935	1936	% INCREASE
SETS	Units	606,784	670,800	10.55%
	Mfrs. Declared Valuation	\$16,173,543	\$16,890,744	4.43%
COMPONENTS	Mfrs. Declared Valuation	\$4,627,112	\$5,703,378	23.26%
RECEIVING TUBES	Units	6,649,544	8,655,046	30.16%

WOULD YOU PREFER  
**to sell or**  
**sell against**  
THIS REFRIGERATOR  
IN 1937!

**FACT ONE:**

The new Kelvinator is Plus-Powered. It has as much as double the cooling capacity of other well-known refrigerators of equal size.



**FACT TWO:**

The new Kelvinator runs only half as many minutes per day—during the rest of the time it maintains low temperatures using no current at all.

---

*And the program that goes with it  
is as different as the product*

---

# NOISE LIMITS

## NOISE IS COSTING US MONEY



By W.  
MacDonald

### Dollars and Cents Incentives For Effecting a Cure

- THE RADIO INDUSTRY**  
Radio Noise Reduction can increase sales of sets, parts, accessories and service.
- THE APPLIANCE MAKER**  
Radio Noise Reduction can contribute a more suitable design feature and customer goodwill.
- THE PUBLIC UTILITY**  
Radio Noise Reduction can increase load from existing receivers and more sets in homes.
- THE BROADCASTER**  
Radio Noise Reduction can swell audiences and step up actual program circulation.
- THE CAR MANUFACTURER**  
Radio Noise Reduction can make it easier for showrooms to move accessory radios.
- THE COMMUNITY**  
Radio Noise Reduction can encourage local buying and more money into the pocket of local shops.



ELECTRICAL GARBAGE, speared into the air by household appliances, commercial equipment and automobile ignition systems, the ductwork features virtually useless on 80% of modern receivers.

## WANTED: A Plan

● Reproduced is an article featured in *Radio Retailing*, October 1936, outlining major elements which must be considered in the formulation of any project designed to effectively reduce man-made radio noise.

● Mr. Deutschmann further emphasizes these points. And other articles will follow.

● Needed is a practical plan to secure action on this difficult problem. For, as one man prominent in automotive circles aptly pointed out after we broached the subject of ignition interference: "There has been too much *said* about this subject and not enough *done* about it!"

**I**F some wand-waver could double the public interest in radio listening overnight by some magical process, he could name his own price to be made up of contributions by the radio stations, radio equipment manufacturers, wholesalers and retailers.

He would make the front pages of all the papers. Broadcasters would play him up in a big way.

Well, today there *is* something that can be done which *would* just about double listening in this country, something which could be accomplished in a very short time. It is not as spectacular as waving a wand. But it is far more certain of lasting results than any black magic.

I refer to a real campaign to eliminate man-made static. Its cost would be relatively small if all the above agencies helped.

# RADIO'S FUTURE

**Why early pleas for cooperative action to stop constriction of sales failed . . . Why curbing of man-made static, always important, is now imperative . . . What costly experience indicates industry must do to insure continued expansion**

**By Tobe Deutschmann**

Radio noise has been bad enough in the past, sideband-cutting sets and cockeyed tone-controls which wiped out the highs contributing their share of trouble along with the noise. But this year, radio brethren, we have started a real drive on high fidelity sets—and did you ever tune one of these wide band jobs in a noisy neighborhood? If you haven't, you haven't heard radio noise. If you want to see somebody good and mad just step up and meet the customer who has been raised by some good selling from a \$69 job to a \$129 high-fidelity job, who has been carefully instructed just how to widen the band to get real quality from local stations, and then tries to get his favorite musical program in any of our typical big city neighborhoods.

Even if high fidelity hadn't brought the whole thing out into vivid relief this year, consider what has happened with the introduction of all-wave sets which can produce a new variety of static for every band they cover.

I ought to feel very sorry about it all. In some ways I do. But having spent a small personal fortune and a number of hard years trying to do something about the suppression of radio noises, failing because of lack of cooperation by the very agencies I outlined at the opening of this article, I must admit that many of my tears are of the crocodile type and I can only say, "Well, they had it coming to them."

## **No One-Man Job**

However, there is no use wasting one's time in being merely negative about a problem. *Radio Retailing*

has asked me to tell something about my original effort to beat this radio nuisance, suggesting some method of making up for lost time. So here goes.

Back in 1928, having studied the effects of man-made static, I decided that surely here was a curse on radio that should be stopped if possible.

General radio reception was then about six years old. The growth that has come in the past eight years since then could easily be foreseen by those who had any vision.

I was not entirely philanthropic. I owned a business which had to be kept running. I couldn't devote time and money without showing *some* return to stockholders. But I figured that if I could sell just enough apparatus to break even on the cost of the educational program which I could foresee was necessary, that the effort would be worth a lot to the industry of which I am a part and to the public as well. So I made the break.

There was practically no knowledge of noise suppression available at the time. The whole effort meant the heart-breaking job of pioneering—pioneering in the laboratory, in the factory, in the field of installation, and in the education of the public and the radio field in general.

First step was to set up a noise laboratory. This was done. All



**“. . . undertook, single-handed in 1928, the herculean, thankless task of enlisting active support of several industries intimately involved but only casually concerned”**

sorts of noisy apparatus was run down, then efforts made to filter it. Some machines filtered easily. Many were stubborn. Finally, however, enough progress had been made along the more common problem lines to make the design of apparatus worth while for production.

#### **Public Wouldn't Pay**

Then came the effort to put over the idea to the public. I was naive enough back in 1928 to believe that the general public, once cognizant of the cause of their radio noises, would pay for filters to put on the offending apparatus. So on went the campaign. Hard earned cash was spent for radio broadcasts. Questionnaires were sent to thousands of listeners. Local radio clubs made surveys. A tremendous amount of information was compiled.

But filters did not sell to any great degree. Everyone seemed to figure that since the fellow next door was making noise that he should stop it first. And you can imagine how much stopping was done under those circumstances.

It was then obvious that a long campaign was needed. No single concern could have undertaken this job. But a coalition of all the various groups in radio would have made such a drive effective. Could their co-operation be obtained? No! They were like the man in the neighborhood who wanted to let Johnny-Next-Door do the job.

#### **Anything Can Be Filtered**

Finally, after several years of hard

effort, with thousands of dollars spent, I dropped my educational campaign. We did continue our engineering, working on a limited number of jobs, and today we are proud to say that our engineers have so much expert knowledge on radio noise that they can effectively stop any noise problem that comes from man-made apparatus. But making noise filters is but a minute part of our regular business.

Now the very fact that this offense unto radio has been allowed to continue is an indictment of the radio business as it stands today, an indictment for a quality which not a single successful manufacturer or station operator would allow around his plant for a minute . . . slovenliness. For it is certainly slovenly to allow what might be described as a dirty condition of radio reception to continue, affecting as it does broadcasting and set sales, when such a condition could be cleaned up.

This slovenliness, in fact, approaches dishonesty when we consider the free and easy promises of radio salesmen who have put thousands of sets into homes with talk of high quality reception when everyone knows that man-made static raises hob with reception. In every city there are dozens of neighborhoods where decent radio has never been heard.

And it is not only the big cities that suffer. In many country neighborhoods it is just as bad because there are no powerful stations nearby. That means turning the sensitivity way up for reception and thereby bringing in all kinds of locally-generated noises.

Enough for the salesmen.

#### **Set Makers Must Lead**

Now, the set manufacturers are maintaining expensive laboratories to improve bit by bit every year the quality of their sets. Yet one lone noise-maker in a neighborhood can reduce the effectiveness of that engineering by fifty to one hundred per cent.

The manufacturers advertise to get good-will. But what about the ill will generated by the listener who, as he finally in exasperation turns off his set, reads the manufacturer's name gaily looking out at him from the dial? He unconsciously associates annoyance and disappointment with the name of that set. Now both these things are pretty expensive losses to the manufacturers. Add to that the fact that with a real reduction in radio noises more sets would be sold, and particularly more high quality sets which are where the real profits are made, and the manufacturers' stake in this problem is apparent.

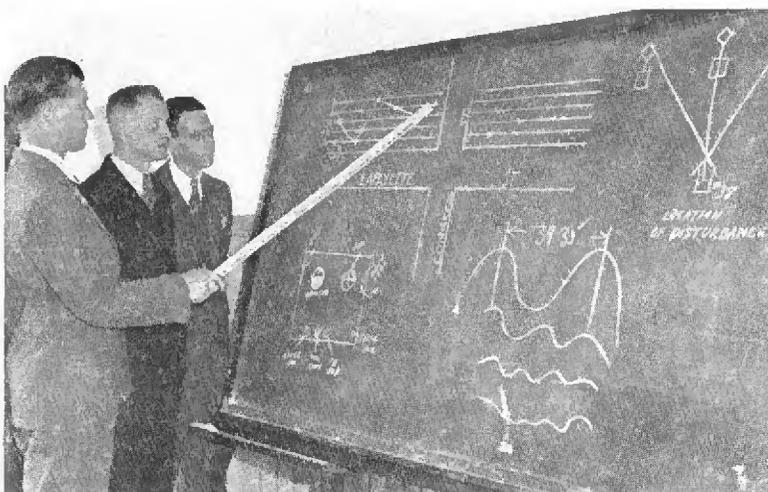
#### **Broadcasters Can Help**

The radio networks and radio stations face a similar situation. "I can never get that damned WXYZ because of the noise!" is a familiar enough statement. To be sure it isn't the station's fault, but like the set manufacturer the station gets the blame. The listener doesn't know anything about the noisemakers in between his set and the station. Radio to him is simply a certain station and his radio set. If the combination doesn't work then he damns either the station, or the set, or both.

Did you ever see a radio station owner in Washington seeking more power? No effort is considered too great, because higher power means a bigger audience, and a bigger audience is something to sell the advertising agencies so that higher rates and more profits can be obtained. Noise elimination would immediately increase listening interest, which is all the radio station has to sell the advertiser.

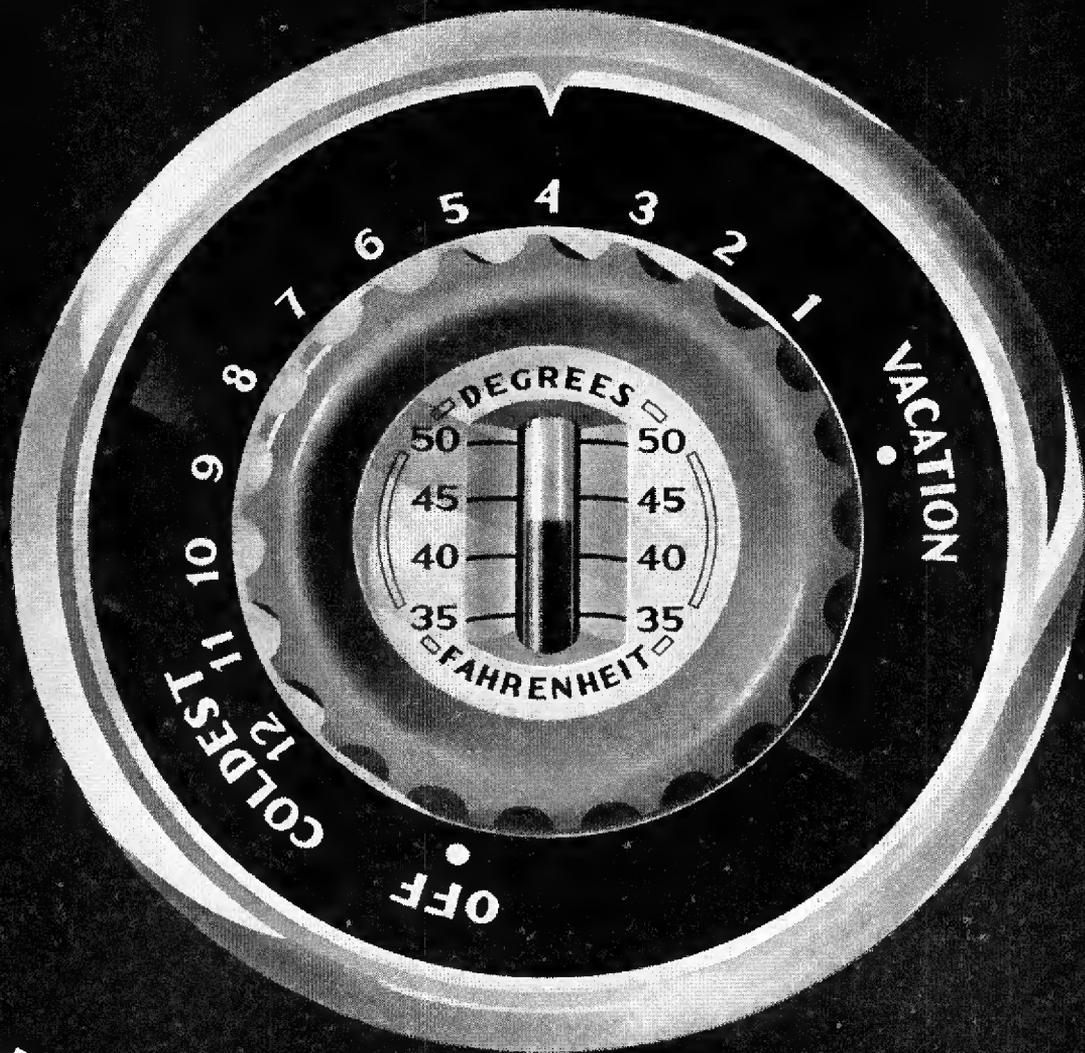
#### **Promotion Essential**

Now surely all these groups have a great and common cause for action. The engineering knowledge is available. If the radio stations would hammer home regularly explanations of radio noises and how they can be cured, if the set manufacturers would organize a fund to carry out this educational process in other directions, a public demand soon would arise for a cure for freedom from the slavery of radio noises.



Forced to do something about man-made noise interfering with radio reception in its police cars, the City of Newark is sharing expense of a 6-months survey requiring the employment of 45 licensed radio operators and engineers with the Federal work Progress Administration, plans to have City officials sell residents the idea of silencing offensive electrical equipment after it is run down.

# AT THE *Leonard* CONVENTION —



*They said it with orders!*

After seeing the new Leonard<sup>o</sup> with its Master Dial and the program back of it—Leonard distributors signed orders for shipment during January and February which equalled 50% of the entire 1936 volume.

This is especially noteworthy

because in 1936 Leonard had the greatest percentage increase in sales among leading manufacturers in the industry.

1937 will be Leonard's greatest year! The Leonard Master Dial will lead the way!

**LEONARD REFRIGERATOR**

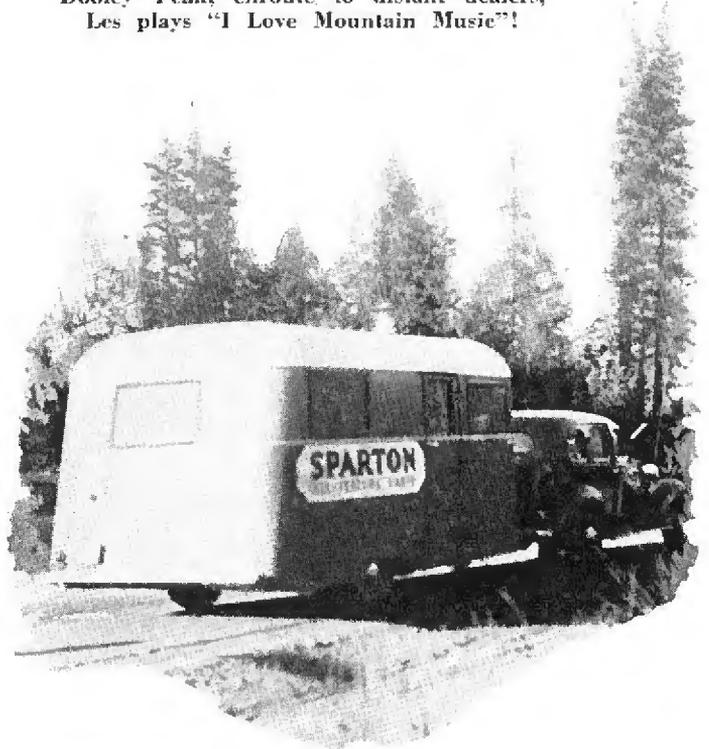
DIVISION OF NASH-KELVINATOR CORPORATION • DETROIT, MICHIGAN

# DISPLAY . . . . MANAGEMENT . . . .

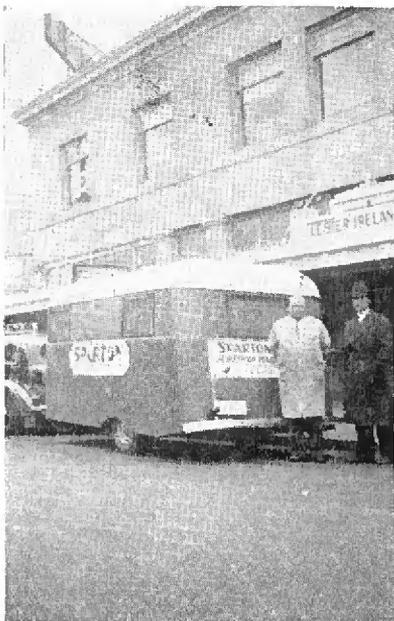


**THE TAKE OFF**—Les Ruble's *Sparton* caravan pulls away from Honeyman Hardware, Portland, Oregon distributor

**THE OPEN ROAD**—5,399 ft. up, crossing Dooley Peak, enroute to distant dealers, Les plays "I Love Mountain Music"!



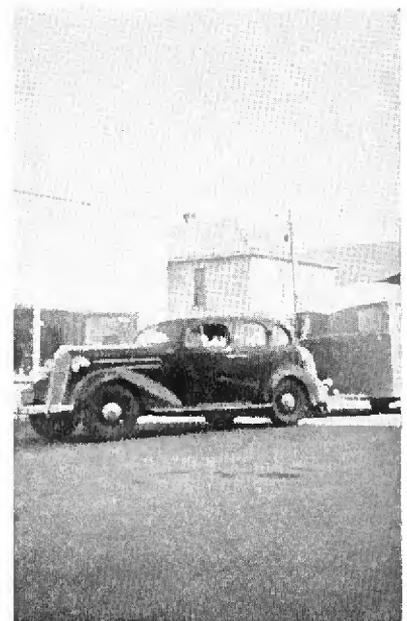
## Another Trailer On Tour



**FIRST STOP**—The trailer pulls up at dealer Lester Ireland's in Hillsboro, brings him out a'running

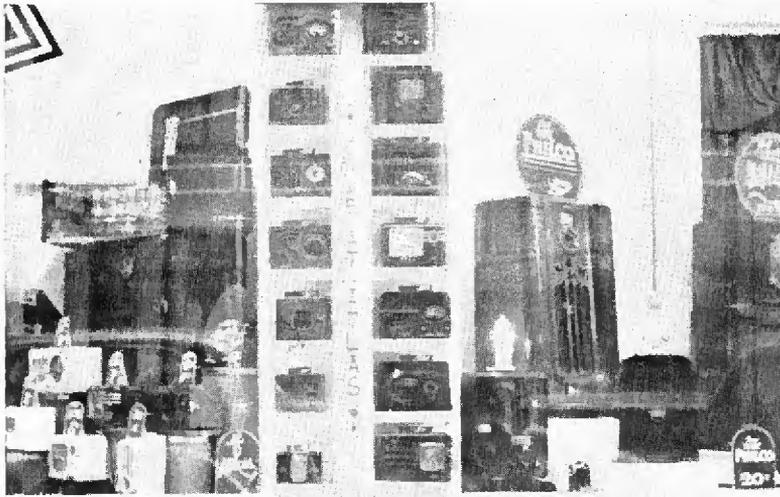
PORTLAND, ORE.—Puzzled are the industry's interesting fact-records who strive to decide just who thought of this trailer selling business first . . . a dealer, distributor or manufacturer. We decline to become embroiled, report simply that the fame of the motor caravan as a sales booster spreads like wildfire, floods us temporarily (and we love it!) with good news and good photographs.

Latest convert is Les Ruble, Sparks-Withington representative, who burns up gas burning up Pacific-Northwest roads in the interests of Honeyman Hardware, Seattle Radio Supply and Jensen-Byrd. Says Les, submitting the reproduced pictures of his trailer in action: "Have been out working with dealers for the past seven weeks and nary a drop of rain." (We looked for a California dateline!—Ed.) This is certainly an efficient and effective way to bring our wares to dealers in outlying districts and many who have not already hitched a wagon to their car to sell the consumer in turn are now thinking seriously about doing it."



**MORE OF THE SAME** — Swinging in at John Day Hardware's. This dealer, incidentally, sells many sets to Piute indians

# ADVERTISING . . . . SELLING . . . .



**MIDGETS ALA SKYSCRAPER**—What to do about a merchandising-obscuring pillar in the center of the show-window? Atlas of Chicago made an asset out of a liability by adding shelves, inserting table models. The effect is so good there may soon be a demand for artificial pillars!

## For The Dealer Who Broadcasts

SPRINGFIELD, MASS.—Writes S. M. Boyd, sales manager for Collins Electric:

"Here is a merchandising idea on radio that might be of interest to your readers.

"Several months ago, we were searching for some way to stimulate our radio sales. Trade-in allowances, premiums, terms, low price—all had lost their effectiveness because everyone was using these appeals continually. We wanted to do something different, something that would get attention and sell radio sets in volume.

"Finally, while reviewing a volume on Salesmanship, I came across this statement '60% of all sales are made by an appeal to an emotional sense'. How true that was, and especially true of radio, which is not an absolute necessity. We had to give our potential customers an *excuse* for trading in their old radio, and that excuse should, if possible, appeal to an emotional sense rather than common sense.

"We engaged Kay Fayre, who has often been called 'New England's Song Sweetheart,' and took a fifteen minute spot on our local radio station following a popular national hour, thus securing for ourselves a large, ready-made listening audience.

"The attached continuity of our November 9th program is self explanatory:

For the next fifteen minutes the Collins Electric Company, the big electrical store on Worthington Street, invites you to listen to Kay Fayre, New England's Song Sweetheart.

**THEME SONG:** When It's Lamp Lightin' Time in the Valley.

**ANNOUNCER:** Next week you will hear on this program with Miss Fayre a surprise Guest Artist. Plan to listen in next Monday at the same time. Right now it's "Me and the Moon".

**SELECTION:** "Me and the Moon."

**ANNOUNCER:** It is estimated that over eight million persons will buy new radios this year. The reason for this great buying trend is first, prices are lower than ever before and second, vastly improved features more than double the entertainment value of a new radio. Two outstanding examples are the *Philco Spread Dial* which brings in twice the foreign stations, and *Focused Tone*, the *General Electric* feature that makes a radio so easy to tune that even a child can operate it.

All this week Collins Electric will feature these famous radios at exceptionally low prices. Your old set will be accepted as full down payment—then nothing to pay for thirty days.

As little as ten cents a day buys a new *Philco* or *General Electric* radio at Collins Electric.

Now Miss Fayre will sing one of America's most popular song hits "A Star Fell out of Heaven".

**SELECTION:** "A Star Fell Out of Heaven."

**ANNOUNCER:** All radios traded in at Collins Electric toward new sets are repaired and given to Miss Fayre to be presented free of charge to some sick shut-in or unfortunate family that would otherwise be unable to afford one.

Among the families who received a reconditioned radio from Miss Fayre and the Collins Electric Company last week was one I am sure you would be interested in hearing about.

Kay, will you read the letter you received from Mrs. Beusec?

**KAY FAYRE:** Surely, Vernon, I have it right here.

Dear Miss Fayre:

I just can't express in words how I felt when the radio you sent was delivered. It is going to mean so much to us. As you know, my husband has not had steady work for over four years and was in the hospital for fifteen weeks this summer so of course we couldn't buy one.

If you could let me know who turned in the set I got, I'd like to write them a letter and thank them too.

Gratefully yours,  
Mrs. A. G. Beusec.

**KAY FAYRE:** My friends, this family is typical of many in the city who have nothing but the barest necessities of life.

When you buy a new radio, wouldn't you rather get it from Collins Electric, knowing that the old set you turn in will bring a little happiness to someone else?

Now may I sing a request number entitled "The Stars Weep"?

**SELECTION:** "The Stars Weep".

**ANNOUNCER:** If you would like to appear on this program with Miss Fayre as a guest artist, file your request for an audition at Collins Electric on Worthington Street. The name of our next song is "I Wished on the Moon".

**SELECTION:** "I Wished on the Moon".

**ANNOUNCER:** There is always a greater assortment of radio models on display at Collins Electric, where trade-in allowances are guaranteed to be as large or even larger than elsewhere. As we bring this quarter hour of song to a close, may we invite you to be with us next Monday at ten o'clock to hear our Guest Artist program?

**CLOSING THEME:** "When Day is Done".

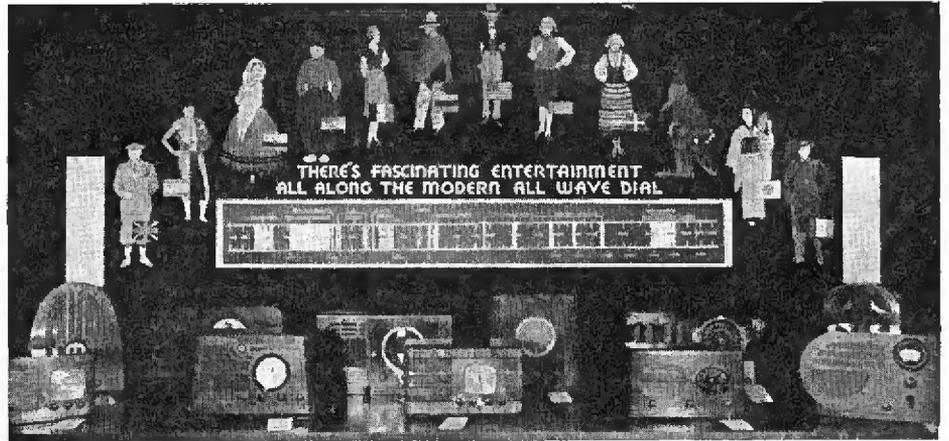
"Thus we solved three problems at once by increasing store traffic; by selling a volume of radio sets; and by disposing of trade-ins in a worthwhile manner that has built for our store a tremendous amount of good will worth far more than the value of the old sets. And, needless to say, we all feel pretty good to be able to do our bit in brightening the lives of folks less fortunate than ourselves.

"The promotion as a whole has been tremendously successful from all angles and we plan to continue it right through the radio season."



**PENCIL WITH A POINT**—*General Electric* dealers are enthusiastic about this new selling tool whose barrel rotates to show at a glance 17 features of specific models

**MORE POWER COMPANY PROMOTION** — Here's the particularly effective window, designed to dramatize all-wave reception, installed in the Potomac Electric Power Company (Washington, D. C.) Building last month for dealer members of the Electric Institute



## Make Service Sell Sets

ALAMEDA, CALIF.—An unusual type of repair loan service produces a large volume of new radio business for Franck's Music and Electric Shop.

Like many others, this store loans sets free of charge to customers who are having their old machines repaired. But this company goes to greater than usual length to make the loaner yield a new machine sale.

Before the loan machine is taken out, the customer's original set is examined, his home looked over and his buying power analyzed—all in relation to the possibilities for making a new machine sale. If the old machine is in bad shape and indications are that the customer is in a position to buy a new one, the "loaner" used is a first-class, late model demonstrator of a type which is most likely to appeal to the individual in question.

If a customer's home and position are such that he would be likely to buy

a high-priced console model, a machine of that type is taken out. On the other hand, if the prospect falls in the lower price bracket, a less expensive machine would be sent out on loan. Of course, in either case, the reliability of the individual has to be verified before the loaner delivery is made.

The repair on the old machine is gone ahead with just as if the company had no idea of selling a new machine. If the new unit is sold, the old machine is reconditioned and made ready for re-sale. If not, it is in readi-

ness for scheduled delivery. But, before delivery of the old machine is made, some excuse is made to call back at the home and find out how the customer likes the late-model demonstrator. If she is pleased with it, an effort is made to close the sale. If the deal can't be made immediately, delivery of the old machine is sometimes delayed a bit or again, the old unit may be put back in for contrast with the new one. The exact procedure depends on the individual case.

Service is thus made to sell new sets.

## Sells By Comparison

MILWAUKEE—High-spot of the radio shows held recently by departments of the three Schuster stores was a direct, deliberate comparison of 1927 radios with new 1937 models. At regular intervals salesmen in each of these stores compared two typical sets of these years for appearance, convenience and reception.

The Schuster shows are credited with a tripling of set sales over last year, were advertised by mail circular to a

list of old customers and new prospects.

Another dramatization of 1937 set virtues was a lecture given at stated intervals by a salesman on the subject of shortwave reception. The lecturer told what could be heard in normal locations, how to tune, how to erect suitable antennas and answered questions asked by his audience. Each person attending was given a free shortwave log book.

The shows lasted three days.



**THE WINNAB!**—Copping first prize in the Fischer-Aeschbach Fada window display contest, this setup by Frank's Music and Radio, Cincinnati, illustrates an effective method of featuring radio, refrigeration, ranges and washers behind a single pane

# NEWS

PEOPLE • PRODUCTS • PLANS

## PARTS MAKERS FORM NEW CORPORATION TO RUN TWO 1937 TRADE SHOWS

Sales Managers Club and RMA Sponsorship Indicated. Shure, Williams, Moss, Berard on Board. Hathaway to Manage

CHICAGO—In October (RRp.32) both the Institute of Radio Service Men and the Radio Manufacturers Association appeared ready to assume responsibility for separate parts shows to be held in New York and Chicago during 1937. Cooperation with the latter organization by the Institute of Radio Engineers seemed possible.

Parts makers have now, however, taken this job off the hands of both organizations by forming a corporation known as Radio Parts Manufacturers National Trade Shows, Inc., whose sole purpose during the year now beginning will be to stage a show at the Stevens, Chicago, June 10-13 and another at a New York hotel not yet selected, October 1-3. RMA sponsorship is indicated and Kenneth A. Hathaway has been named managing director.

S. N. Shure of Chicago has been elected president of the new corporation, will work on the Board of Directors with Fred D. Williams of Philadelphia, Arthur Moss and A. A. Berard of New York. An announcement from the management says that the annual RMA convention may be held at the Stevens immediately preceding the parts show there, that the Sales Managers Club, Institute of Radio Service Men and "The Representatives" will definitely meet at the time of the show in the same hotel.

No mention is made of the IRE.

### Shure Heads Show Group



S. N. Shure, microphone manufacturer who is the newly elected president of the Radio Parts Manufacturers National Trade Show, Inc.

## TUBE PRICES RISE 11 PER CENT

RCA and Raytheon Executives Attribute Rise to Increased Manufacturing Costs, Point to Increased Dealer Profit Possibilities

NEW YORK—Verifying rumors concerning a probable increase in receiving tube prices two companies had made statements to the press as this issue of *Radio Retailing* closed. From Eugene M. Deacon, general sales manager of the RCA Radiotron Division, the following advice was received:

"After years of steadily declining prices, the RCA Radiotron Division of the RCA Manufacturing Company has announced an increase in the prices of practically

all types of radio receiving tubes, effective January 2. It is pointed out that the large number of different types of tubes, for many of which there is now only a limited demand because of the obsolescence of the radio sets in which they are used, and mounting material and labor costs have made a complete review of costs necessary.

"Newly announced prices, which represent an over-all increase of 11 per cent, will be welcomed by radio dealers and radio service engineers as a step in the

right direction of increasing dollar unit sales on radio tubes from the all-time low to which they had fallen."

From Earl S. Dietrich, manager of the Raytheon Production Corporation's distributor sales, the following was received:

"Raytheon has believed for a long time that radio tube list prices have been too low to permit a proper profit for the distributor, dealer or serviceman. Going back to April 1, 1935, Raytheon advises its distributors: 'Raytheon believes that the jobber and the dealer must be given a fair margin of profit and that this margin can be obtained only through higher and not lower list prices.' I firmly believe radio tube distributors, dealers and servicemen will welcome the new higher prices. They should result in greater profits to all concerned in the sale of receiving tubes during 1937.

"Price modifications are the result of changes in type costs due to increased material and labor costs, variations in the proportional demands for the different types and need for additional revenue for every branch of the tube business. Some type prices remain unchanged but there has been an appreciable increase on most Raytheon types."

### Stewart-Warner Opens New Branch

CHICAGO—Stewart-Warner has announced the opening of a new factory branch at 2545 South Michigan Avenue, to serve the northern Illinois and Indiana territories. It will operate under the name of Stewart-Warner Distributors Company.

The building, fronting 70 feet on Michigan Avenue, containing 12,000 sq. ft. of floor space, is one of the most beautiful in the Midwest. Several complete displays of radio and refrigeration, showing the entire available group of models, are to be installed.

Thomas H. Maginnies, for the past ten years district manager in this territory, will manage the new organization.

### Cook Heads New Fairbanks Department

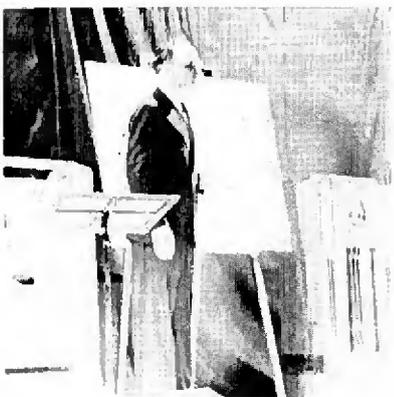
SAN FRANCISCO—A special department has been set up in the Fairbanks-Morse San Francisco organization, to be known as the Home Appliance Department. R. A. Cook will be in charge.



W. PAUL JONES, general manager of the Fairbanks, Morse Home Appliance Division, points with pride to the new refrigerator's features



JOHN S. GARCEAU, advertising manager. To him, his assistant Paul Eckstein and our subscribers we humbly apologize for printing a Garceau caption under an Eckstein photo on page 38 of our December issue



PARKER H. ERICKSEN, snapped by Radio Retailing's candid camera, as he announced "No new radios until May" from the convention platform

## FAIRBANKS, MORSE INTRODUCES MORE LIBERAL FINANCE PLAN

Dealers Get Free Refrigeration Floor Planning. No New Radio Models Due Until May

INDIANAPOLIS—One of the most liberal financing plans to date was rattled out of the box by W. Paul Jones, general manager of the home appliance division of Fairbanks, Morse & Co. at that firm's unveiling of 1937 refrigerator models in Indianapolis, December 17. Born of the PHA discovery that major appliance purchases are deggoned good risks, Jones laid these features before the 300 distributors present:

(1) Dealers get free floor planning on refrigerators for 90 days—January, February and March.

(2) Dealers have privilege of limited recourse plan in 1937. For \$5 extra price the dealer is free of liability after customer makes first four payments. Details of plan entail a buying back of repossessed boxes by distributors.

Second feature of 1937 Fairbanks-Morse merchandising is a series of formal shows to be staged through distributors to give dealers a chance to hear the complete story of the line. Coincident with this selling activity, a first national distributors refrigeration and home laundry equipment service school will be held in Indianapolis January 19-22, according to George H. Glassman, service manager.

In the radio division new models will not be shown until May, Parker H. Ericksen announced.

New Fairbanks-Morse people to make their bow were John S. Garceau, advertising manager, an old Kelvinator man, Fred H. Parrish, chief engineer in laundry equipment, and Paul Eckstein, new assistant manager, formerly with the radio division of General Electric Company.

## RCA VICTOR ANNOUNCES 17 NEW MODELS

Joyce Outlines Advertising Plans, Has Great Hopes For Company-Sponsored Metropolitan Opera Broadcasts

CAMDEN—RCA Victor opened up its new-year selling campaign with an announcement of seventeen new radio models, including four automobile radios, ranging in price from \$32.95 to \$154.95, according to an announcement by Paul C. Richardson, Manager of RCA Victor's Radio and Phonograph Division. Says Richardson:

"The new models received an enthusiastic reception from RCA Victor wholesale distributors in advance showings which took place in various parts of the country. Wholesalers heartily acclaimed the selling potentialities, and backed up their opinions by large orders for the new merchandise which exceeded by far the most optimistic advance estimates."

Thomas F. Joyce, Advertising Manager, announced preparation of an outstanding program of advertising and sales promotion for the new models, which includes magazines, cooperative newspaper advertising, coast-to-coast "Magic Key" Radio program.

Said Joyce: "When \$500,000.00 worth of Metropolitan Opera broadcasts go on the air—that's front-page news! Every paper in the land features the story, and there's rejoicing by millions of music-lovers in every corner of America—for the Metropolitan is the world's most famous operatic organization.

"It's even bigger news for RCA Victor Dealers! The 14 big Saturday afternoon broadcasts are RCA-sponsored, coast-to-coast, to a ready-made audience of over 10,000,000 people. These 10,000,000 will hear strong selling messages—throughout

three full hours, every Saturday—urging them to buy the merchandise the Dealers sell.

"But RCA Victor has gone a step further. RCA Victor has built a Dealer tie-in merchandising program which will send buying prospects to thousands of stores. More than 500,000 good prospects are guaranteed to RCA Victor Dealers in the first three months of 1937. They will call to get free copies of a handsome, 32-page book—virtually a handbook of the opera, and almost an essential to one's fullest enjoyment of the broadcasts.

"The plan, in addition to building store traffic, assures sales-making demonstrations."

Richardson's new-line announcement points out that both chassis and the cabinetry of the new models are the direct result of an extensive survey made among the retail trade and consumers. Over 1,400 Dealers and 10,000 consumers participating in the survey gave their ideas on features most in demand, and as a result the thirteen new home receivers have lighter cabinet finishes, more curves in cabinet-design, greater individuality of character, model for model.

## NEW S.M. FOR STANLEY

ST. LOUIS—William Gaston has been named sales manager for the Stanley Distributing Corp., Crosley distributor. Gaston is well known in the St. Louis territory.



Ernest H. Vogel, formerly sales manager of the G-E radio division, has been appointed manager of this division of the company's appliance and merchandise department, according to P. B. Zimmerman, general sales manager of this department.

**WEBSTER-CHICAGO STARTS  
NEW PLANT CONSTRUCTION**

CHICAGO—To provide increased facilities for the manufacture of Webster-Chicago products construction has been started on a new factory located on Bloomingdale St. at Central Avenue. Ground was broken on November 30 and the new plant, scheduled for completion April 1, will be a single-story structure with approximately 50,000 sq. ft. of floor area and its own railroad siding.

This move, according to vice-president John Erwood, comes in the twenty-third year of his company's operation.

*Admiral Ups Clippinger*



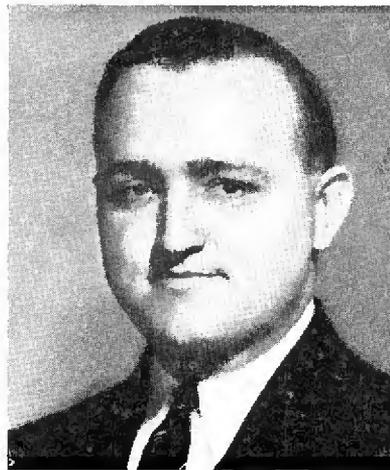
J. H. Clippinger, former Continental Radio & Television Corporation, Michigan, Ohio, Pennsylvania and West Virginia district manager, who on January 1 assumed new duties as vice-president in charge of sales and advertising

*Three G-E Men  
Advanced*



Ralph J. Cordiner, formerly manager of the General Electric Company's radio sales division, has been appointed assistant manager of the appliance and merchandising department, which includes the radio sales division, household appliance sales division, specialty appliance sales division and the construction material sales division. In this important post, vacant since December, 1933, Cordiner reports directly to vice-president Charles E. Wilson

*Kennedy Joins  
Triumph*



J. P. Kennedy, former account executive for The Fensholt Company, Chicago, has been named sales and advertising manager of the Triumph Manufacturing Company. Jim was for years a leading South Bend, Indiana, independent serviceman. A graduate of Notre Dame, he later became advertising and service manager of a wholesale radio parts house. While with Fensholt he prepared advertising for the All-Star, Junior campaign, later worked closely on merchandising matters with Thordarson, Burgess, Belmont, Aladdin and Continental Carbon



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CHICAGO—The Arlab Manufacturing Company, magnetic and dynamic speaker manufacturer recently renting the factory formerly occupied by the Audiola radio plant at 430 South Green St., has purchased through the U. S. District Court the goodwill, trademarks, patents, etc., of

Manufacture of items formerly made by Baritone will be continued, under the direct supervision of Walter J. Paredes, former chief engineer.

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William T. McNaboe, former General Electric man, who now directs national sales and promotion of Dictograph's new "silent radio"

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C. C. De Wees, assistant advertising manager for Stewart-Warner since 1935, now steps up as advertising manager of the radio and refrigeration divisions. F. R. Cross continues as general advertising manager of the parent company

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LONG ISLAND CITY, N. Y.—J. M. Marks, general manager, advises that George A. Lyons, who joined the Fada Radio and Electric Company several months ago, leaving Atwater Kent, will henceforward work directly with Fada dealers and distributors in the North Central states.

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**BIG CONVENTION MONTH FOR SPARTON**

"Old Timers" Meet January 5. Distributors Confer January 18. See New Refrigerator Line January 22-23

JACKSON, MICH.—On January 5 Sparton "Old Timers", men who have been with the Sparks-Withington Company five years or more, meet for their annual banquet, presided over by Captain William Sparks, who informs us that more than 1,000 qualify.

On January 18 Sparton distributors arrive at Jackson for a factory sales conference, stay for the convention set for the Hotel Hayes on January 22 and 23. At this time the completely redesigned Sparton line of electric refrigerators is to be shown. The plant is now in production and distributors are assured of quantity deliveries immediately upon their return home. Sparton, it is reported, has practically no held-over inventory of 1936 refrigerators. Nor have its distributors any appreciable stocks of last season's models.

Immediately after the convention at Jackson regional sales meetings are to be conducted in all parts of the country by Arthur T. Haugh, general sales manager, E. T. R. Hutchinson, Harley Wall, M. F. Bickford and other factory executives.

**Clarostat Decal Clicks**

BROOKLYN, N. Y.—Decalcomanias in green, black and gold, furnished by the Clarostat Manufacturing Company to its jobbers for distribution to dealers are in considerable demand. They bear the words "Authorized Dealer."

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**Emerson Display Clicks**

NEW YORK—The Emerson Radio and Phonograph Corporation advises that a display created by Lewis E. Staar, on the sales staff of The Schoellkopf Co., Emerson distributor in Dallas, proved so effective that it was used at three special showings.

It was installed at the Eastland County Fair, September 16 to 19; in a special show window for Lee Super Service, Cisco, September 20 to October 3, and at the Rising Star Fair, October 8 to 10.

Numerous dealerships were opened as a result of these showings and an increasing volume of sales in this territory is reported.



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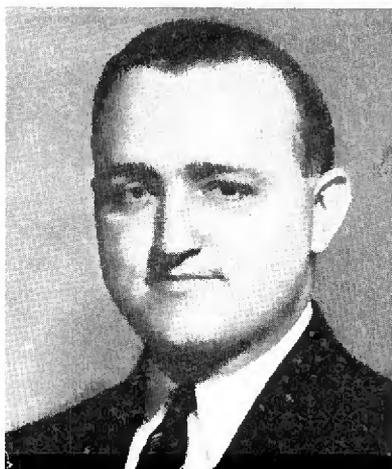
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**Emerson Display Clicks**

NEW YORK—The Emerson Radio and Phonograph Corporation advises that a display created by Lewis E. Staar, on the sales staff of The Schoellkopf Co., Emerson distributor in Dallas, proved so effective that it was used at three special showings.

It was installed at the Eastland County Fair, September 16 to 19; in a special show window for Lee Super Service, Cisco, September 20 to October 3, and at the Rising Star Fair, October 8 to 10.

Numerous dealerships were opened as a result of these showings and an increasing volume of sales in this territory is reported.

FACTORY CAPACITY

Increased  
35%

**RAYTHEON**  
TRADE MARK



IN ORDER TO TAKE CARE OF THE CONSTANTLY INCREASING DEMAND AND TO PROTECT THE TREMENDOUSLY GROWING MANUFACTURERS', JOBBERS' AND DEALERS' REQUIREMENTS FOR RAYTHEON TUBES, NEW EQUIPMENT AND NEW PRODUCTION MACHINERY HAVE BEEN INSTALLED IN A NEW BUILDING, GIVING AN ADDITIONAL UNIT WHICH INCREASES RAYTHEON'S PRODUCTION CAPACITY BY 35%! WITH THESE INCREASED FACILITIES, EVEN DURING THE SEASON OF PEAK DEMAND!

RAYTHEON GUARANTEES CONTINUED PROMPTNESS TO ALL ITS CUSTOMERS MEETING THE EXACTING REQUIREMENTS OF LEADING SET ENGINEERS WHO SPECIFY RAYTHEON TUBES, INCREASINGLY PROTECT JOBBERS AND DEALERS WHO HANDLE THE RAYTHEON LINE AND GUARANTEE THE QUALITY AND SALABILITY OF RAYTHEON'S PRODUCTS.

LICENSED SET MANUFACTURERS EQUIP THEIR SETS WITH RAYTHEON TUBES BECAUSE THE NAME RAYTHEON INSURES TRADE AND CONSUMER QUALITY APPEAL, AND HIGHER COMPARATIVE SET UNIT PRICES WITH LESS SALES RESISTANCE.

NO WONDER RAYTHEON TUBES ARE USED AND DEMANDED BY ALL LEADING RADIO PARTS DEALERS AND SERVICEMEN FOR GREATER TUBE PROFITS.

THE MOST COMPLETE LINE—ALL TYPES OF GLASS, OCTAL BASE, METAL AND AMATEUR TRANSMITTER TUBES  
RAYTHEON PRODUCTION CORPORATION

- 420 Lexington Ave., New York, N.Y.
- 445 Lake Shore Drive, Chicago, Ill.
- 415 Peachtree St., N.E., Atlanta, Ga.
- 55 Chapel Street, Newton, Mass.



# FOR R

From the stage of the Metropolitan Opera House in New York come the operas RCA is sponsoring on the air. They are broadcast every Saturday afternoon over NBC's nationwide Blue network.

# RADIO CORPORATION OF AM

# RADIO AT ITS BEST!

*Radio Corporation of America sponsors matinee broadcasts of Metropolitan Opera every Saturday*

IN the realm of music, opera is royalty. And king of music's royal family is the Metropolitan Opera Company. To sing on its stage in New York is the ambition of every operatic performer. To hear the musical masterpieces produced there is the desire of every music lover.

The Radio Corporation of America now makes it possible for all America to enjoy the Metropolitan Opera during the current season. Saturday matinee performances are broadcast direct from the Metropolitan Opera House stage, over NBC's nationwide Blue network. These broadcasts bring to every American family the world's most magnificent music.

### *RCA's service is universal*

RCA, the only organization which actively participates in every branch of radio, contributes largely to the comfort and well-being of thousands the world over each day. It provides the most rapid means of communication. It links the sky and the sea and the land. Its broadcasting facilities bring entertainment, news and education.

These RCA services signify public confidence in the RCA name—the sort of confidence that creates good-will for every merchant handling RCA products. And this latest service—broadcast of the opera—is another good-will measure that will benefit all associated with the name of RCA.

RCA stands for radio—soundly engineered. Its past achievements prove this. And RCA sound engineering is some day going to bring radio *sight* to the world's millions!

---

RCA MANUFACTURING CO., Inc. • RCA COMMUNICATIONS, Inc.  
NATIONAL BROADCASTING CO., Inc. • RCA INSTITUTES, Inc.  
RADIOMARINE CORPORATION OF AMERICA

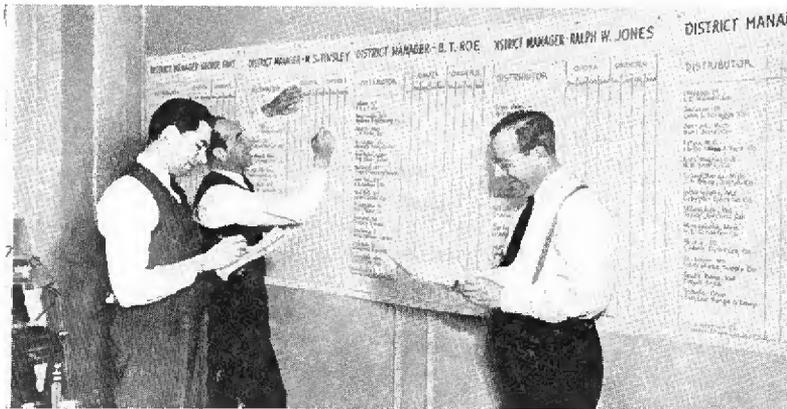
### *6 Ways the Metropolitan Broadcast can Increase Sales for You*

- 1 It will send people into your store for their free copies of the "Story of the Opera."
- 2 There will be strong commercials on Magic Voice, Magic Brain, Magic Eye, Metal Tube radios, phonograph radios and Victor Records.
- 3 No other radio manufacturer has a coast-to-coast program—RCA has two for you...the Metropolitan Opera and the Magic Key.
- 4 The Opera broadcast maintains the traditional association between the Metropolitan Opera and RCA Victor—making you the musical leader of the community.
- 5 It stimulates interest in good music, good instruments and Red Seal Victor Records.
- 6 Finally, RCA has a splendid MERCHANDISING PLAN that will draw 500,000 listeners to radio and music shops. Get the details from your RCA Victor distributor.

Listen also to "The Magic Key of RCA" every Sunday, 2 to 3 P. M., E. S. T., on the NBC Blue Network.

ERICA • Radio City • NEW YORK

## Leonard Line Clicks at Detroit Convention



Sales manager R. I. Petrie (right) calls off orders received from distributors during the shindig to assistant sales manager R. R. Ludington (at the board) and Jack Kerr



G. W. Mason (left), president and H. W. Burritt, vice-president of the Leonard Refrigerator Company, who predicted during the get-together that 1937 will be a banner year

### ZENITH AUTO-RADIOS OUT

CHICAGO—E. A. Tracey, vice-president in charge of sales for Zenith Radio Corporation has just announced Zenith's new line of automotive radio priced from \$29.95 to \$69.50 and ranging from five to eight tubes. The factory has been in production on the new line for some time and sets are ready for immediate shipment.

Under the direction of Robert F. Weinig, recently appointed automotive radio head, meetings were held in Chicago, New York, Atlanta, Kansas City, Los Angeles and San Francisco from December 28th through January 14th, at which the new line was introduced to distributors. Participating in meetings were Commander E. F. McDonald, Jr., president, Mr. Tracey, Mr. Weinig, Paul F. Bryant, assistant to the president; Edgar G. Herrmann, advertising manager; Norbert H. Terwilliger, sales promotion manager, Frank Smolek, service manager, and James H. Rasmussen, assistant sales manager.

### JOBBER APPOINTMENTS

**ARCTURUS**—For territory in vicinity of Melrose, Mass: *Melrose Sales Company* of 407 Franklin St.

**LEONARD** — *Southern Wholesalers, Inc.*, Washington and Baltimore; *Graybar Electric Company*, Durham, N. C.; *H. B. Shank Company*, Ft. Wayne, Ind.; *Earl Goetze, Inc.*, Kansas City and Springfield, Mo.; *Charles Ilfield*, Las Vegas, N. M.; *Graybar Electric Company*, Phoenix, Ariz.

**LIFETIME**—For Iowa, Minnesota and Wisconsin: *Sound Engineering Co.*, La-Cross, Wis.

**CLAROSTAT**—For Washington, Oregon, Idaho, Montana, Northern Utah and Southern British Columbia: *George D. Norris*, Seattle.

**CROSLY**—For Los Angeles territory: *Associated Wholesale Electric*. For San Diego territory: *San Diego Auto Electric*.

**SPEDEX**—Eastern sales agents for this company's line of amateur and professional keys and buzzers, *D. R. Bittan Sales*, New York.

**EMERSON**—For central Nebraska and southwest South Dakota: *W. M. Dutton & Sons, Co.*, Hastings, Nebraska.

**TROY**—*W. A. Dewitt, Stewart Radio Company*, Belleville, New Jersey.

**UTAH**—*Offenbach Electric Co.*, San Francisco; *General Radio Supply*, Camden, N. J.; *Thomas H. Brown*, New Haven, Conn.; *Acme Radio Supply*, Milwaukee; *Southern Equipment Co.*, San Antonio; *Radio Products Sales Co.*, Los Angeles; *Lewis Sporting Goods Co.*, Raleigh, N. C.; *Sun Radio Co.*, Baltimore and *The Belmont Corporation*, Minneapolis.

### ELECTRONIC LABS. PUSHES CONVERTERS ON AIR

INDIANAPOLIS—In what is believed to be the first instance of a radio parts manufacturer using radio time to assist dealers in merchandising and selling his products, the Electronic Laboratories has inaugurated a series of test broadcasts over six stations in the Midwest farm belt.

These broadcasts, sponsored jointly by Electronic and the Zenith Radio Corporation, will feature the new Zenith Inverter, a vibrator-type converter designed and manufactured by Electronic Laboratories, which makes it possible to operate any standard 110 volt radio on 32 volt farm lighting plants. The radio stations being used include KFBI, Abilene, Kan., WKBH, LaCrosse, Wis., KFJB, Marshalltown, Ia., WJAG, Norfolk, Neb., KMA, Shenandoah, Ia., and WNAX, Yankton, S. D.

According to Norman Keevers, Electronic executive, the decision to try radio advertising in establishing rural interest in the converter was reached after an extended investigation of the farm radio market recently completed by chief engineer William Garstang. This investigation discloses that the sale of new radios to owners of farm lighting plants was definitely retarded by the fact that available 32 volt sets gave little choice of models, were relatively expensive, had low trade-in value and became completely obsolete in the event of a change to power lines.

### NEW MOTOROLA PLANT STARTED

CHICAGO—Construction has been started on a new \$250,000 factory and office building at 4545 West Augusta Blvd., by the Galvin Manufacturing Corporation, will provide 85,000 additional square feet of floor space for manufacture of Motorola auto and household radios.

According to Paul V. Galvin, president and treasurer, the present output of 2,000 auto sets daily in the concern's factory at 847 W. Harrison St., will be increased to 3,000 in the new plant. Scheduled for completion on April 1, 1937, the plant will be one and two stories in height with the general offices in the second story section. The exterior walls will be blue and white terra-cotta, with exterior corners curved, and there will be almost continuous window lighting on the first floor.

Upon completion of the building, the company will occupy over 135,000 square feet of factory and laboratory space.

### Peck With Universal

ATLANTA—P. W. Peck of 1299 Emory Road, N. E., has just been appointed factory representative for the Universal Microphone Company of Inglewood, Calif. He will cover Virginia, North and South Carolina, Mississippi and Tennessee.

*New!*

THE  
DELUXE

# SKYSCRAPER DUN-CHARGER

*The Higher the Tower  
The Greater the Power!*

Incorporating  
the Famous and Exclusive  
DUNN Governing Principle

DEALER PRICE

**\$15<sup>00</sup>**

(Including  
Skyscraper Tower)

COMPARE IT WITH OTHERS

"The Higher the Tower,  
the Greater the Power."  
Far up above ordinary ob-  
structions, the sturdy Sky-  
scraper 10-foot installation  
puts the Dun-Charger in  
the full wind stream, where  
the slightest breeze can  
operate it with undiminished  
power.

It's above the broken wind  
stream deflected by the  
roof of the building and  
filtered through the trees,  
right out in the open,  
exposed to the full force of  
the wind where it can op-  
erate with 100% efficiency.

## SKYSCRAPER Advantages



The **NEW**

### DUN-CHARGER ENGINEERING AGAIN IN THE LEAD!

First to build a successful governing device for a wind-charger, Parris-Dunn now leads the field again with a giant 10-foot unit, that will in practically every instance increase the power output of the charger by 25% or more, as compared to the old-fashioned 6-foot unit. With the exclusive and outstanding Dunn Governing Principle, the New Skyscraper Dun-Charger at no increase in price, represents the greatest value in a wind-charger ever offered the radio dealer.

This new Skyscraper Dun-Charger, with the new and sensational Parris-Dunn merchandising program, gives you the finest battery radio "sales clinch" you've ever had! Learn all about this outstanding new development in wind chargers. Feature the Skyscraper Dun-Charger and watch your radio sales grow. Mail the coupon today.



The **OLD**

*Mail this  
Coupon!*

**PARRIS-DUNN CORPORATION, Clarinda, Iowa, U. S. A.**

*20 Years of Successful Manufacturing Experience*

Please send me full particulars of Skyscraper Dun-Charger and Parris-Dunn Merchandising Program.

Name \_\_\_\_\_ Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_

## FRIGIDAIRE CONGRATULATES SALESFORCE HINTS AT REVOLUTIONARY IMPROVEMENT

DAYTON—The more than 20,000 members of the national selling organization of Frigidaire Division, General Motors Sales Corporation were congratulated December 15 for their effort in rolling up the greatest volume of any year in Frigidaire's history.

E. G. Biechler, general manager, expressed the appreciation of the management and hinted at developments for 1937 that offer promise of another record-shattering sales period.

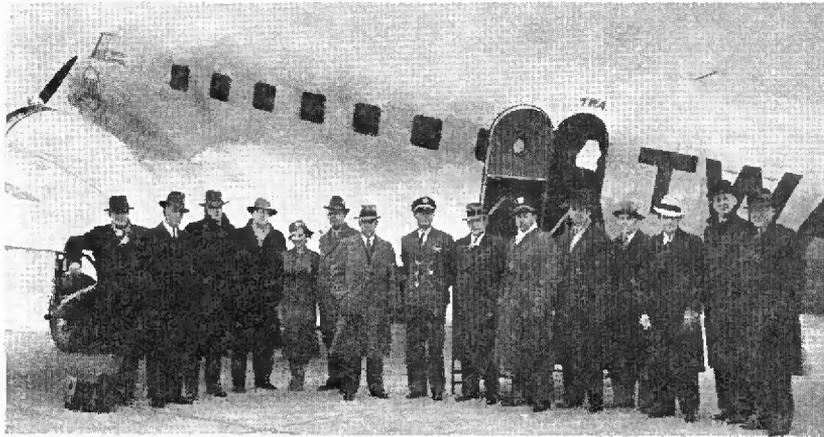
"A deep sense of appreciation prompts us to address this message to the Frigidaire selling organization," the statement read.

"In 1936, you achieved the greatest sales success in the entire history of the refrigeration industry. During the first six months you sold more Frigidaires than during the entire year of 1935, or any other year."

Discussing developments in the 1937 product, to be announced in the spring, Biechler said:

"We are working now to make 1937 a greater year. Soon you will have new and more saleable products, featuring a revolutionary improvement that will be the talk of the industry and instantly capture the imagination of the public."

### *Frigidaire, In The Air, 33 Years After Wright*



Inauguration of regular transcontinental passenger service east and west from Dayton on the thirty-third anniversary of Wright's first flight, saw a group of General Motors executives in the air. Left to right: R. J. Horton of Frigidaire; John W. Weyer, Delco brake; H. G. Little of Lord & Thomas; James W. Irwin, Ruth K. Rhodes of TWA, E. R. Godfrey of Frigidaire and Charles T. Lawson; D. B. Kuhn of the airline; Frank R. Pierce of Frigidaire; L. G. Fritz of TWA; Frank G. Lyons, P. V. Sprout, V. A. Hetzel, E. J. Barney of Frigidaire and L. L. Diehl of the Dayton Chamber of Commerce

### WARD PRODUCTS EXPANDS

CLEVELAND—The Ward Products Corporation, manufacturer of automobile antennas and sound systems, has just moved into its own new building on East 45th Street. Manufacturing facilities and sales office space are doubled.

A branch in Canada and an export office in New York City gives this company wide distribution facilities.

### Solar Improves Dealer Contacts

NEW YORK—The Solar Manufacturing Corporation, well-known manufacturer of capacitors of all types, has appointed James Schoonmaker of 4133 Shenandoah Ave., Dallas, district sales manager for the Texas territory. E. P. Demarast of 1127 Venice Blvd., Los Angeles, has been made district sales manager for California.

### Kelvinator Advances Saylor

DETROIT—W. E. Saylor, for the past six years a member of Kelvinator's advertising and sales promotion department, steps up to the position of sales promotion manager, according to Sam C. Mitchell, director of advertising and sales promotion.

### CROSLY AID DISTRIBUTORS

CINCINNATI—A new department which will assist distributors organize and train their sales organizations has been formed by the Crosley Radio Corporation, Thomas W. Berger, general sales manager, announces.

It will be headed by William C. Stoner who was for many years with one of the large manufacturers of washing machines and later with two distributors of electric refrigerators.

### Three New Leonard Men

DETROIT—Appointment of three regional representatives of the Leonard Refrigerator Company's merchandising division is announced by R. I. Petrie, sales manager.

W. R. McAllister will work in the southeastern district, with headquarters at Atlanta; Don C. Rulo, mid-western district, with headquarters at Fort Wayne and William J. Geiger, middle-Atlantic district, with headquarters at Philadelphia.

McAllister is from the radio field, formerly worked for Radio Bar, Fada, RCA, Brunswick, Atwater Kent and Federal. Rulo was vice-president of Rowlands Halleck of Toledo while Geiger at one time represented National Radio and Westinghouse Home Appliance.

### GOV'T SELLS SHORTWAVE GUIDE

WASHINGTON—The Electrical Division, Bureau of Foreign and Domestic Commerce, has just released a 15-page booklet written by Lawrence C. F. Horle, prominent radio engineer, designed to aid the consumer desiring to get the maximum performance out of shortwave receivers of all types.

Selling for 25 cents, the booklet tells how shortwaves are propagated, instructs the user in the art of tuning, gives installation tips, lists principal shortwave stations, includes a time zone map of the world and a chart showing great-circle distances.

### Dakota Radio Incorporated

YANKTON—The Dakota Radio Corporation of Yankton has just been incorporated and capitalized for \$100,000 by R. A. Bowman, Jr. and G. H. Ellerman of Yankton and Milo Kramar of Tabor. The concern will handle electrical appliances and radio at both wholesale and retail.

### PILOT WINS PLASTIC AWARD

NEW YORK—Pilot Radio Corporation has just won special recognition for the design of its plastic-cased model 203 receiver. A plaque was presented to the concern for excellence of design at a modern plastics competition held at Rockefeller Center.

### Mealey Heads Hotpoint Refrig.

CHICAGO—Harry C. Mealey, a member of the General Electric Organization for the past eighteen years, has just been appointed to head up the Hotpoint refrigeration division of the Edison General Electric Appliance Company, of Chicago, says R. W. Turnbull, vice-president and general sales manager of the company.

**SHAFER WRITES BOOK**

CHICAGO—Henry Shafer, of General Transformer Corporation's distributors' division, has just written a booklet entitled: "Industrial Liberty . . . its effect on national recovery and advancing civilization," issued by Photopress, Inc. In it, he briefly outlines the history of the human race from the "beginning" and shows that industry is the sinews of advancing civilization and that personal liberty, free speech, freedom of assembly as well as freedom of the press would be a mockery without freedom of industry.

**Dealer Runs Clever Zenith Advertisement**

CONWAY, ARK.—Immediately after the presidential election, R. T. Cole of this city ran the following 4 3/4 by 5 9/8-inch advertisement in the Local Log Cabin Democrat:

**The Value of Radio**

On the night of the presidential election in 1916 downtown streets were crowded with people trying to get reliable election reports which were slowly coming in from more or less unorganized sources over a telegraph wire. The election of Hughes was generally conceded at 10 o'clock p.m. At 11 o'clock a brief wireless report received by the writer indicated a radical change in the trend in favor of Wilson. Although the information

was official it was considered of little value because of the new method of communication but final returns gave Wilson a decisive majority.

Last night the city's streets were deserted. Practically every interested citizen was at home, comfortable by his fireside receiving official returns from the pressrooms of the nation's greatest newspapers with illuminating comments by such men as Mr. Kautenborn and John B. Kennedy every few minutes via the modern radio. Surely the radio has become the essential factor in the home and ZENITH has played an important part in its evolution. Since 1923 ZENITH has made fine commercial radios and is heading the list this year in sales. The ZENITH is designed to deliver absolute fidelity in speech and music with controls that produce tones that are restful. Inspect these instruments at 921 Front street. The cost is low and your old set has a good trade-in value.

**Cooper-Louisville Active**

LOUISVILLE—A new sales lineup is announced by S. J. Rapier, president, Cooper-Louisville Co., Crosley distributor here. Charles F. Lister, well known appliance salesman, has been added to the sales force. A separate sales division has been created for Crosley Koldrink bottle coolers and four salesmen will devote themselves exclusively to this line. And another new department will be devoted exclusively to the sale of Crosley "Xervacs", the hair-growing machine invented by Dr. Andre A. Cueto, of Cincinnati.

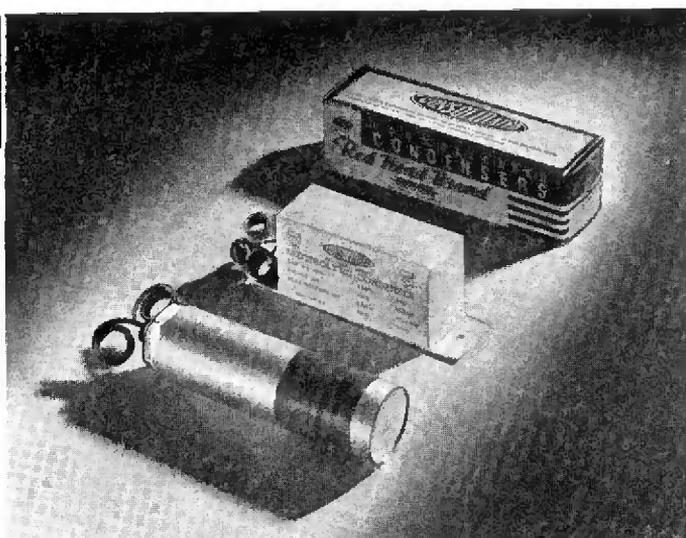
**Busy Hotpoint Exec**



Here's R. W. Turnbull, vice-president and general sales manager for the Edison General Electric Appliance Company, grabbing a bit of grapefruit after telling 150 utility merchandising men about his new refrigerators, laundry equipment and water-heaters in Chicago last month

**RED HEADS ON PARADE**

Keyed to the modern trend—to today's exacting demand of the Radio Industry for perfection and accuracy in capacitors, we present RED HEAD BRAND CONDENSERS. Their perfection is the culmination of years of experience in capacitor assembly. They are dependable. Small and compact, yet uniform and accurate in electrical characteristics. They are rugged units—full of stamina. RED HEADS have what it takes for a long, serviceable, dependable life under the most trying conditions.



On the assembly line—in the engineer's laboratory—in the serviceman's kit—on the dealer's shelf, you will find RED HEADS, demonstrating their ability—offering a definite, practical solution to the condenser problem. CONSOLIDATED'S engineers are ready to confer with you on their use—on solving your condenser problems.

- THE "RED HEAD" LINE**
- DRY ELECTROLYTICS**
    - In metal containers—
    - Inverted Metal Cans— with lock nut mounting with lug mounting
    - In Silver finish tubes with lug mounting
  - WAX CARTON UNITS**
    - Single and Multiple Section
  - TUBULAR UNITS**
    - With Solid Tinned Leads
  - TRANSMITTING FILTER CONDENSERS**
  - PAPER TUBULAR BY-PASS CONDENSERS**
    - Triple Seal Brand
    - Red Seal Brand
  - REPLACEMENT UNITS**
    - For all standard receivers, power packs, etc.
  - HIGH AND LOW VOLTAGES**

**"RED HEADS" are DEPENDABLE CAPACITORS**

**REPLACEMENT CONDENSERS**

RED HEAD BRAND CONDENSERS are available in all standard sizes and capacities—in both high and low voltages. Replacement units are also available for practically all current radio receivers, power packs, public address systems, etc. While small and compact, accurate duplication of mounting specifications are maintained. Write for complete replacement lists.

**JOBBERS**

RED HEAD BRAND CONDENSERS are backed by a consistently maintained sales policy for your protection. Dealers appreciate their dependability, their accuracy and long life. Attractively packaged, they offer the utmost in quality—combined with eye appeal—and profit.

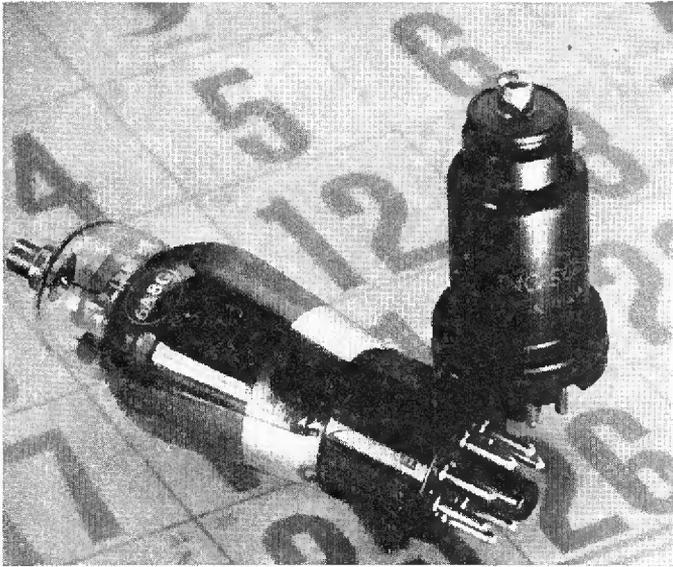
**MANUFACTURERS**

CONSOLIDATED'S Engineering staff is ready to give you the benefit of their years of experience in the practical application of capacitors. You are invited to confer with them—to work out a practical solution to your own problem.

WRITE FOR PRICES

**CONSOLIDATED WIRE AND ASSOCIATED CORPORATIONS**

512 So. Peoria St. • Chicago, Ill.



for 1937  
**SELL TUBES ON**  
*"Velvet"*

In the Tung-Sol consignment plan there's no such thing as tied-up capital. A stock of Tung-Sol radio tubes on your shelves means "velvet" sales. You pay only for tubes sold. Orders — not cash investment — keep your stock replenished.

Desirable locations are still open for independent service organizations which can qualify. Write for the name of your nearest Tung-Sol tube wholesaler today.

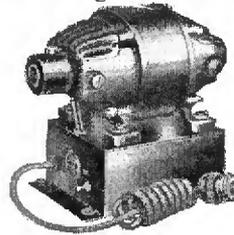
**TUNG-SOL**  
*Tone-flow radio Tubes*

TUNG-SOL LAMP WORKS, INC.  
 Radio Tube Division

Sales Offices: Atlanta, Boston, Charlotte, Chicago, Dallas, Detroit, Kansas City, Los Angeles, New York. General Office: Newark, N. J.

**Janette Rotary Converters**

The original D.C. to A.C. converters with all wave filters developed exclusively for radio and sound apparatus.

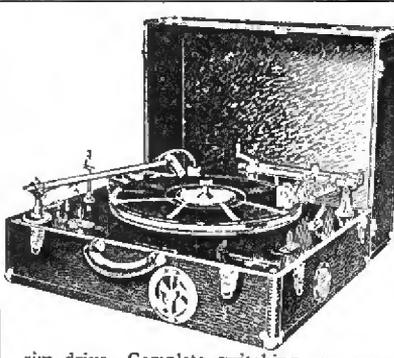


**CAPACITIES:**  
 35 to 3250 watts.  
 6, 12, 32, 115 and 230 volts  
 D.C. to 110 or 220 volts, 1 phase,  
 60 cycle A.C.

**Insist on a Janette**  
 Ask For Bulletin No. 13-25

**Janette Manufacturing Company**

555 W. Monroe Street, Chicago, Ill., U. S. A.  
 New York — Boston — Philadelphia — Los Angeles — Milwaukee



**UNIVERSAL  
 Portable  
 Recording  
 Machine**

A precision machined, compact outfit that positively eliminates all waver — Records in either direction at 33-1/3 or 78 R P M 90, 110 or 130 lines per inch — 110 volt AC 100% synchronous motor — solid 16 in. turntable — Constant speed

rpm drive — Complete switching arrangement for head set monitoring from playback or cutting head — Reinforced black leatherette carrying cases — Unequaled value — Superlative performance.

**UNIVERSAL MICROPHONE CO., Ltd.**  
 424 Warren Lane  
 Inglewood, Calif., U.S.A.

**WHY FEED**  
 A "POWER-HUNGRY" STORAGE  
 BATTERY THAT LOSES SALES  
 WITH UNRELIABLE OUTPUT?

**The EPCO STORAGE BATTERY**  
 FOR AUTO RADIO AND ELECTRICAL  
 ACCESSORY DEMONSTRATION **\$19.75**  
 List Price  
 Usual  
 Jobber Discount  
**\$15.75**  
 6 volt-5 amps.

**ELECTRICAL PRODUCTS CO.** 6537 RUSSELL ST.  
 DETROIT, MICH.

**Kleen Zoning**  
 by **HORTON**  
 NEW SENSATION IN WASHERS

A new principle in washing machine construction — Kleen-Zoning packs a terrific sales punch! *Exclusive with Horton!* Write now for details of this dramatic principle — Kleen-Zoning, the new buy-word in washers!



**HORTON MANUFACTURING CO.**  
 3606 OSAGE ST., FORT WAYNE, IND.

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# NEW APPLIANCES

USE THE CARD ON PAGE 48 TO OBTAIN MORE INFORMATION



GIBSON

## 43 Gibson Refrigerator Co.

**Models:** 1937 line of refrigerators.

**Description:** 4, 5, 6 and 7 ft. models in Standard group; 5, 6, 7 and 8 ft. models in Custom Built group. Latter are also provided in all porcelain. Twin cylinder, hermetically sealed MonoUnit compressor is retained. Minor refinements have been added. Freez'r shelf is included in all models excepting the 4 ft. Standard. A new feature is the Swing-Shelf. A touch of the finger swings this big basket outward, exposing its contents and making it easy to select or replace articles.—*Radio Retailing*, January, 1937.

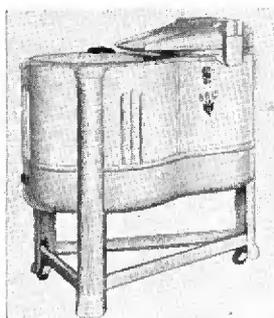
ABC

## 44 Altorfer Bros. Co.

**Model:** 1937 washer line.

**Description:** Heavy duty washer No. 157, has new all-aluminum wringer with finger-tip control, new ABC French type agitator washing principle, one piece, rigid type, all-steel chassis.

No. 137 is an extra large capacity, medium priced washer.



Model 117 has heavy-duty wringer, finger-touch clothes feeder, French type agitator washing principle.

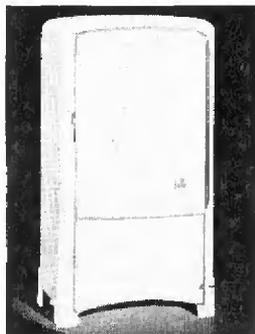
Farm Washer No. 137-G, is a heavy duty, extra

large capacity farm washer. Also available in a standard capacity model. Both equipped with the Iron Horse 4-cycle gasoline engine.

ABC is also announcing a new line of ironers. De luxe console cabinet ironer model YA has thermostatic heat controls and two-speed roll control.

Roll-About ironer, model RA is a fully automatic type.

Cabinet ironer model TA has porcelain top cabinet which swings out at right angles forming ample shelf space.—*Radio Retailing*, January, 1937.



KELVINATOR

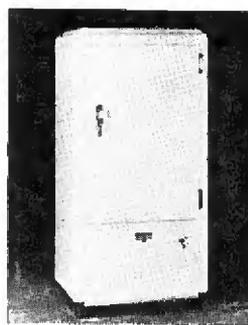
## 45 Kelvinator Corp.

**Models:** Refrigerators.

**Description:** Greater depth and width, greater accessibility plus powered units and ultra-modernism in style featured. 16 models. One entirely new model has been added to the line—a 9 cu.ft. porcelain unit in the medium price range. Three newly designed specials have been introduced ranging in size from 5.71 to 7.81 cu.ft.

Temperature control is stressed with thermometers provided to clearly show temperature within the food compartment.

Suspended crisper and basket in standard line from 5 ft. size up. Fast freezing trays in many models. Centered lighting for the interior with the light diffused through an ivory shade is included.—*Radio Retailing*, January, 1937.

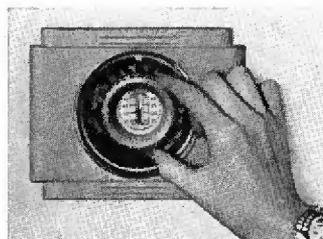


WESTINGHOUSE

## 46 Westinghouse Electric & Mfg. Company

**Model:** "Kitchen Proved" Refrigerators.

**Description:** New line features the Westinghouse "built-in-watchman" and scientifically located thermometer; has triple food saver, triple storage compartment and adjusto-shelf; Delphinium blue in one series with a soft shade of green in another series, lends a note of color to the water servers, left-over dishes, and complementary accessories. Nineteen models comprise the series ranging from the Aristocrat series of de luxe models to the Patrician and Hostess series and three special low-priced models. Freon has been adopted on the entire line as a refrigerant.—*Radio Retailing*, January, 1937.



LEONARD

## 47 Leonard Refrigerator Co.

**Models:** 1937 line of refrigerators.

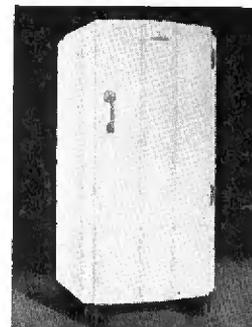
**Description:** Master Dial is featured. Housed in an attractive panel, it gives the housekeeper positive temperature control at all times. In the center is a thermometer, at eye level, to check the temperature of the food compartment at any time.

Len-A-Dor foot pedal

is retained. Closely associated with this convenience is the rearranging shelf upon which articles may be placed while the food in the cabinet is rearranged. The vegetable drawer has an adjustable metal partition.

Interior lighting is given special consideration. When the door is opened a green shaded electric light, scientifically located, uniformly illuminates the entire food compartment. All ice trays have rubber grids and a moist storage crisper is provided.

Eleven models comprise the line, 3 in porcelain and 8 in permalain.—*Radio Retailing*, January, 1937.



GENERAL ELECTRIC

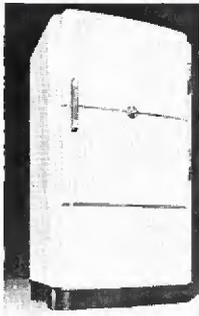
## 48 General Electric Co.

**Models:** 1937 line of refrigerators.

**Description:** Eighteen models in both flat top and monitor type styles in porcelain and Glyptal enamel finishes. Sizes ranging from 4 ft. to 15 ft. cabinets. With Glyptal finish (flat top) they come in 4, 5, 6, 7 and 8-ft. cabinets; with porcelain enamel panels, 12- and 15-ft.

A lift top model with Glyptal enamel sides and porcelain top is offered.

Features include the Thrift-ometer, which shows the cabinet temperature at a glance; sliding top shelf, as well as other sliding shelves; new finger tip door latch; egg rack; fruit basket and matched covered dishes. Cabinet equipment varies with each model.—*Radio Retailing*, January, 1937.



**APEX**

49 *Apex Rotarex Corp.*

**Model:** 1937 line of refrigerators.

**Description:** Model B 800, 8 cu.ft. net storage space; 18.8 sq.ft. shelf area.

Model B 665, 6.65 cu.ft. storage space, 15.6 sq.ft. shelf area.

Model B 625, 6.25 cu.ft., 12.9 sq.ft. shelf area.

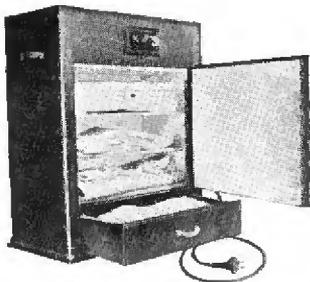
All cabinets have interior indirectly illuminated.

The two larger models have sliding shelves and safety zone indicator.

Transparent radio type dial controls are illuminated from rear. Giant freezing chamber with removable shelf provides large freezing space for meats, etc.

De luxe set, consisting of six dishes for left-overs, water jug, vegetable crispier, wire fruit basket and wire service tray, is optional equipment.

Model B 410 completes the line.—*Radio Retailing*, January, 1937.



**DESERTAIRE**

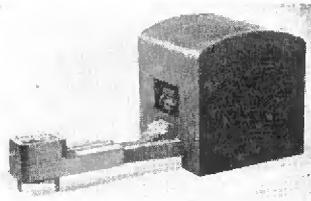
50 *Gill Electric Mfg. Corp.*

**Model:** All-electric wardrobe-cabinet for infant's apparel.

**Description:** Designed to sterilize, heat and thoroughly dry, and maintain in a dry and heated condition all of an infant's wearing apparel. Clothes, bedcovers, etc., may be kept in a sterile,

electrically-dried and heated compartment at body temperature.

These walnut cabinets come in two sizes; one of semi-portable design and the other, larger in size, for nursery use. Equipped with rubber wheels for moving about the home. The larger model has an electric circulating heater which may be turned on to heat the immediate surroundings.—*Radio Retailing*, January, 1937.



**NORGE**

51 *Norge Heating and Cond'g. Div., Borg-Warner Corp.*

**Model:** Domestic coal stoker.

**Description:** Two models are featured, one designed for homes with seven rooms or less; one for larger residences; both may be installed for use with warm air furnaces, steam, vacuum or vapor boilers; precision gears of chrome nickel steel built by Borg-Warner are featured.

The master control eliminates possibility of overheating and the pilot fire control keeps a very small fire in mild weather. Thermostat control.

Model S-30-6, capacity, 30 lb. of coal per hour; 320 to 370 lb. hopper capacity.

Model S-50-6, 50 lb. of coal per hour capacity; 400 lb. hopper capacity.—*Radio Retailing*, January, 1937.

**NICHROME**

52 *Fleck Co.*

**Model:** Electric Heating appliance replacement elements.

**Description:** Exact duplicate replacement elements in various popular wattages from 200 to 1000. These Nichrome replacement elements are of precise wattage, voltage, diameter and length.

Manufactured by the Driver-Harris Co. and marketed by Fleck Co.—*Radio Retailing*, January, 1937.

# ROME WAS NOT BUILT IN A DAY

Neither was our Radio Industry, nor McGRAW-HILL DIRECT MAIL DIVISION lists. Considerable time, money and effort is required to build and maintain a good product and the yardstick of what is best is determined by what is best in the present day market. So it is with McGRAW-HILL DIRECT MAIL DIVISION lists. As the result of time, money and effort (over 10 years of RADIO list building, over \$100,000 a year on building and maintaining all lists and the cooperation of over 200 field salesmen, in addition to the regular staff of experts)—they are the most accurate available today and are daily corrected; in fact geared for effective results under present marketing conditions.

AS in your own business only experienced operators can be relied on to produce best results; so it is at McGRAW-HILL, only carefully supervised and trained list compilers and checkers are entrusted with the work of building and maintaining these RADIO mailing lists.

A folder describing the thousands of RADIO Trade Outlets will gladly be sent you. In this folder is a state count, helpful in market analysis, a description of the various RADIO lists with counts and prices.

WE repeat "Rome Was Not Built IN A Day" but you can start building for increased profits in less than a day by writing, wiring or phoning for details on RADIO lists that give maximum results. NOW is the time.

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**REMO**

MASTERTONE  
De-Luxe  
with full approximate range

HIGH QUALITY RECORDING AMPLIFIER  
WITH 10 POSITION METER

DOUBLE CELL CRYSTAL  
MICROPHONE

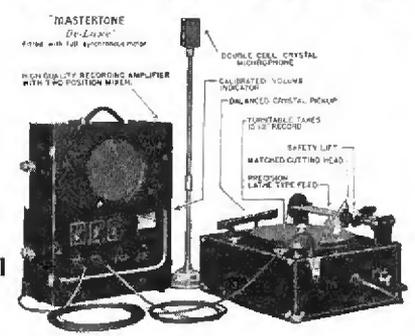
CALIBRATED VOLUME  
INDICATOR

BALANCED CRYSTAL PICKUP

TUNABLE TAPES  
COLOR RECORDS

SAFETY LIFT  
WATCHED CUTTING HEAD

PRESUMPTION  
LARGE TYPE FEED

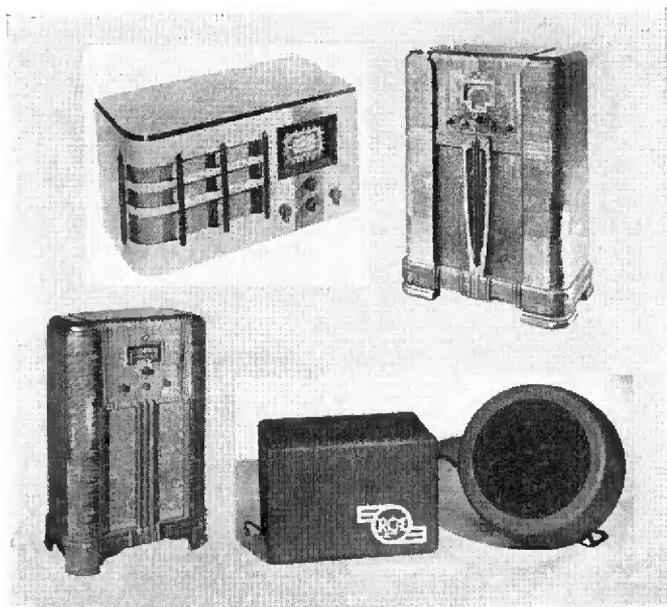


**MASTERTONE  
DE-LUXE  
Portable Model**

• Write for  
Bulletin RR-1

**RECORDING EQUIPMENT MFG. CO.**  
6611 Sunset Boulevard, Hollywood, Calif.

# PREVIEW of NEW PRODUCTS



RCA-VICTOR

RCA Mfg. Co., Inc. Camden, N. J.

Models: 17 new sets.

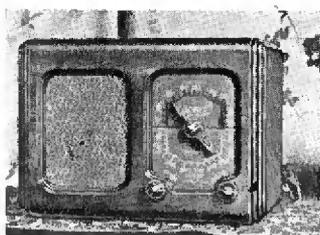
**Description:** Consoles — Model 6K-1, 6 tubes, 540-6600 kc.; 6K-3, 6 tubes, 540-18,000 kc.; 7K-1, 7 tubes, 540-18,000 kc., Magic Eye; 8K-1, 8 tubes, 530-22,000 kc., Magic Eye; 9K-1, 9 tubes, 530-22,000 kc., Magic Brain, Magic Eye; 9K-3, 9 tubes, 530-22,000 kc., Magic Brain, Magic Eye, Beam power amplifier, band spreader; 10K-1, 140-410 and 530-60,000 kc., Magic Voice which eliminates boom and allows only the desired "controlled" notes to radiate into the room, Magic Brain and Eye, higher fidelity. All of the above sets have 12 in. speaker, phonograph connection, avc, antenna wave trap, automatic tone compensation.

Table sets—Models 5T-1, upright type; 5T-6, compact; 5T-7, compact, entire cabinet veneered, chiefly in maple blonde wood, lacquered and polished (see cut); 5T-8, compact. Following features are common to each: 5 tubes, 540-6600 kc., 4.5 watts output; 6 in. speaker, new type dial, phono connection, avc, antenna wave trap, automatic tone compensation. Model 6T-5, 6 tubes, 530-1900 and 5800-21,600 kc., Magic Eye, 8 in. speaker; 7T-1, 7 tubes, 540-18,000 kc., Magic Eye, 8 in. speaker, edge lighted dial. Both

6T-5 and 7T-1 have features listed for 5 tube sets.

All but two of the above radios (Models 5T-1, 6T-5) come with metal tubes.

Auto-radios — Model 67M-2, 6 tubes (3 metal), 8 in. speaker, 2 unit construction, non-glare dial, avc, 9 watts; 67M-1, 6 tubes (3 metal), single unit, 9 watts, avc, overhead speaker (extra) if wanted; 67M, single unit, with metal tubes, avc; 67M-3, de-luxe 3 unit instrument, Magic Voice, twin electro-dynamic speakers, avc, 3-way selector switch for speakers, 9 watts, 6 tubes (3 metal). — *Radio Retailing*, January, 1937.



CROSLY

Crosley Radio Corp., Cincinnati, Ohio

Model: C-516.

**Description:** 5 tubes, a.c.-d.c., superhet, with two double-purpose tubes: tuning range, 540-1725 kc.; 5-in. dynamic speaker, full-vision air-

plane type dial calibrated in kilocycles and meters. Table cabinet of solid mahogany.

Price: \$16.95.—*Radio Retailing*, January 1937.

## ZENITH

Zenith Radio Corp., 3620 Iron St., Chicago, Ill.

Models: 1937 auto-radios.

**Description:** Big black safety dial now has a "single-figure beam" which lights up only the figure to which the tuning indicator is pointing. Even this illumination may be switched off. Other features include: "Truevision Turntable Tuning" illuminated station finder; a "Guardian



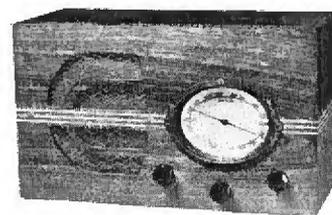
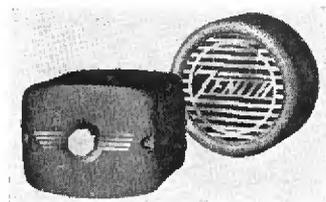
Reminder" which makes it almost impossible to leave the set turned on when not in the car; dual speaker combinations with quick plug-in connections; Metaglas tubes; triple filtering for noise elimination.

Zenith also offers a control unit that is interchangeable from steering column to dash control mountings at will. One skeleton control fits all panel plates.

Five models: one 5 tube and two 6 tube one-unit sets; two with external speaker, 6 tubes and 8 tube super-deluxe.

A complete line of antennae also available.

Prices: 5 tubes, \$29.95; 6 tubes, self contained, \$39.95 and \$49.95; 6 tubes, external speaker, \$49.95 to \$54.95, according to speaker; 8 tubes, \$69.50.—*Radio Retailing*, January, 1937.



## WESTINGHOUSE

Merchandising Hdqts., Westinghouse Radio, 150 Varick St., New York, N. Y.

Model: WR-217 Serenader.

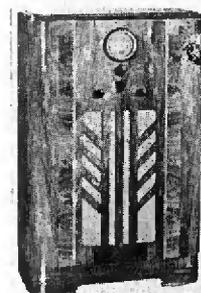
**Description:** Designed primarily as a "personal" set; compact horizontal type; available in 3 finishes—walnut with three stripe ivory inlay, chinese red and antique ivory with harmonizing stripes and knobs.—*Radio Retailing*, January, 1937.

## PHILCO

Philco Radio & Television Corp., Philadelphia, Pa.

Models: 9X, 62T, 89B, 61B, 610B, 620K, 61F.

**Description:** 9X has automatic tuning making a total of six now available with this feature. 9 tubes,



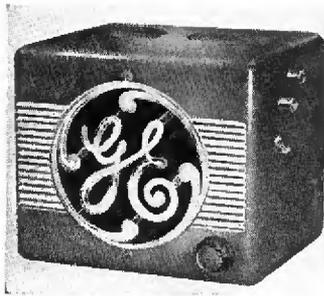
inclined sounding board, three tuning ranges.

62T, 61B, 610B and 89B are table sets. 62T and 89B, American reception only. All are equipped with five tubes except 89B which has six. All have two tuning ranges except 610B which has three.

620K, console, 3 tuning ranges, 6 tubes.

61F, 5 tubes, console, 2 tuning ranges.

Prices: 9X, \$100; 62T, \$29.95; 89B, \$39.50; 61B, \$39.95; 610B, \$44.95; 620K, \$69.95; 61F, \$49.95.—*Radio Retailing*, January, 1937.



## GENERAL ELECTRIC

General Electric Co.,  
Bridgeport, Conn.

**Models:** FA-80, FA-61, FA-60 auto-radios.

**Description:** Model FA-80 incorporates automatic frequency control as a contribution to simplified tuning and therefore safe driving, 8 metal tubes, 540-1600 kc., Class B amplification, compensating avc., antenna circuit-matching system, 6½ in. electro-dynamic speaker. Gray case with chromium plated grille and face plate 8x9x7½ in.

Model FA-61, 6 metal tubes, 540-1600 kc., avc., antenna circuit-matching system, same case as FA-80.

Model FA-60, incorporates all features of the FA-61 except two-point tone control. Brown crackle finish case.

Sets will be available in February. Prices not available as we go to press.—*Radio Retailing*, 1937.

## ARCTURUS

Arcturus Radio Tube Co.,  
Newark, N. J.

**Model:** New tubes.

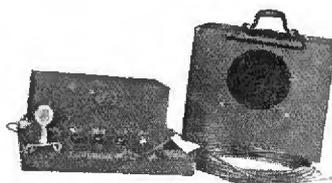
**Description:** 1A4, 1B4, 6E5, 6G5. Also the following G types: 1C7G, 1F5G, 1H4G, 1H6G, 1J6G, 5U4G, 5V4G, 5X4G, 5Y4G, 6B8G.—*Radio Retailing*, January, 1937.

## TRIAD

Triad Mfg. Co., Inc.  
Pawtucket, R. I.

**Device:** 6AB6G auto radio tube.

**Description:** Output tube: filament current has been reduced from .8 amps. to .5 amps. and the bulb size reduced to the small ST-12 bulb. Octal type base.—*Radio Retailing*, January, 1937.

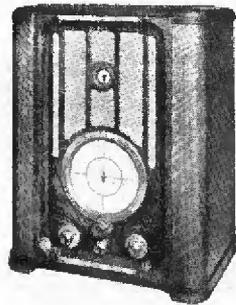


## SHEAFFER

W. A. Sheaffer Pen Co.,  
Fort Madison, Iowa

**Model:** Radio-clock desk set.

**Description:** A combination radio clock and desk set with pen and pencil. Comes in green or brown hand-tooled leather.—*Radio Retailing*, January, 1937.



## PILOT

Pilot Radio Corp.,  
Long Island City, N. Y.

**Model:** Series 20 and 620.

**Description:** 7 tubes, all-wave, a.c.-d.c., extra large dial, tuning beacon, 8 in. speaker. Also has phonograph jack and extra speaker socket.

Series 20 is for 110-125 volt power line and series 620 for operation on 220-240 volt lines.—*Radio Retailing*, January, 1937.

## OPERADIO

Operadio Manufacturing Co.,  
St. Charles, Ill.

**Model:** 115 portable P.A. system.

**Description:** A high grade 12-watt class A system. Suitable for orchestra and voice reinforcement. Compactly designed, it permits mixing one or two low level microphone inputs such as crystal type and phonograph input. Provision for remote use of dual diaphragm crystal microphone; dual tone control, heavy duty 10-in. speaker.—*Radio Retailing*, January, 1937.



## LIFETIME

Lifetime Corp., 1010 Madison  
Ave., Toledo, Ohio

**Device:** Model 90 microphone.

**Description:** Employs the Kinetic principle of sound reproduction. Basic principles of this mike eliminate many of the inherent faults of a pressure operated unit, in that it contains no stiff diaphragm with its basic resonance peaks. There is no accentuation of the base response even when working very close to the microphone, the statement reads.

Furnished in a high impedance unit, operating directly into grid, and a low impedance unit to operate into a 200 or 500 ohm line. Either model may be operated without a preamplifier directly into a high gain main amplifier (110 to 120 d.b.)—*Radio Retailing*, January, 1937.



## TURNER

The Turner Co.,  
Cedar Rapids, Iowa

**Device:** VT-73 Microphone.

**Description:** Correct response for voice transmission; anti-resonant cable, 100 per cent shielded plug of machined brass, chrome finish. May be used on the desk or as a hand mike. Adjustable swivel head. Output only minus 55 d.b.

**Price:** \$27.50 including mike stand and plug.—*Radio Retailing*, January, 1937.

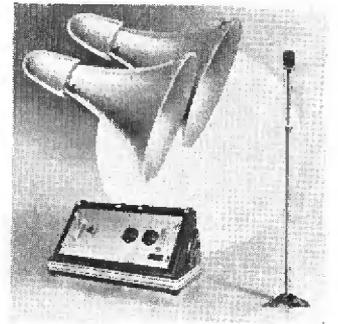
## EMERSON

Emerson Radio & Phonograph  
Corp., 111 Eighth Ave.,  
New York City

**Model:** Colored radio.

**Description:** Model A 130, 6 tube, a.c.-d.c., super-heterodyne, may now be had in white, red and green, with contrasting trim.

**Price:** \$24.95.—*Radio Retailing*, January, 1937.



## TECHNA

Techna Corp., San Francisco,  
Calif.

**Model:** 21J4 outdoor public address system.

**Description:** Complete outdoor public address system including microphone, amplifier, and two exponential horn type dynamic speakers. The amplifier is mounted in a metal cabinet identical to 21J. The 15-watt beam power amplifier provided for use with the 21J series incorporates all the features of advance public address design and includes the use of the new 6L6 beam power tube.

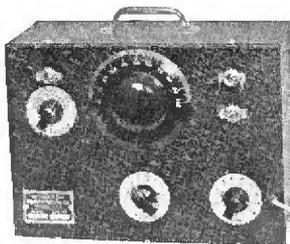
**Price:** \$230.—*Radio Retailing*, December, 1936.

## CLAROSTAT

Clarostat Mfg. Co., Inc., 285  
N. 6th St., Brooklyn, N. Y.

**Device:** Metal-tube ballast resistor replacements.

**Description:** Come in the fewest number of types to take care of the greatest variety of sets so equipped. A representative stock kit of twelve different types is proving popular for taking care of most calls with a minimum inventory investment.—*Radio Retailing*, January, 1937.



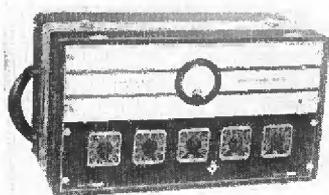
### MONARCH

Monarch Manufacturing Co.,  
3341 Belmont Ave.,  
Chicago, Ill.

**Device:** Signal Generator.

**Description:** Originally intended to bridge the gap between the service oscillator and the laboratory signal generator, it is now widely used for other purposes such as production testing, etc. It is, in fact, suitable for most signal generator uses where the high precision of the laboratory instrument is not required. The output controls read microvolts directly and small signal leakage compares favorably with other generators.

Range, 100 kc. to 30 mc.; operates from 115 volt, 50-60 cycle supply, all direct current requirements supplied internally; a type 41 tube is used in an electron coupled circuit. — *Radio Retailing*, January, 1937.



### LAFAYETTE

Wholesale Radio Service Co.,  
Inc., 100 Sixth Ave.,  
New York City

**Device:** 20-watt portable P.A. system for marine use.

**Description:** Designed for crew calls, broadcasting radio programs to all points of the vessel, and as a paging system. May be had with a speaker horn designed to be used in hailing passing vessels or in giving docking directions from the bridge.

This is but one of many systems available for marine use.—*Radio Retailing*, January, 1937.

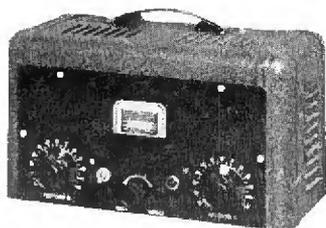
### ASTATIC

Astatic Microphone Laboratory, Inc., Youngstown, Ohio

**Model:** "Tru-Tan" crystal pickup.

**Description:** Features better reproduction and longer record life; constructed with a scientifically designed off-set head which holds the needle, throughout the entire playing surface of a 12-in. record, practically true to tangent of the circle at all points. Maximum error never exceeds 1.5° from true tangency, it is stated. Has full double row ball bearing base swivel with hardened steel pivot trunnion. A reversible head permits the needle to be dropped in from the top.

**Price:** \$17.50.—*Radio Retailing*, January, 1937.



### WEBSTER—CHICAGO

The Webster Co., 3825 W.  
Lake St., Chicago, Ill.

**Device:** 2L-20 amplifier.

**Description:** Portable 20-watt amplifier; input arrangement permits using two microphones or one microphone and phonograph or two phonographs; output is tapped at 3-6-250-500 ohms. Compact and light in weight. — *Radio Retailing*, January, 1937.

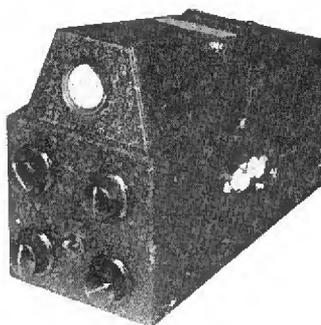
### SPEED-X

Speed-X Mfg. Co., 646 Jessie  
St., San Francisco, Calif.

**Device:** Telegraph Keys.

**Description:** Complete line for every purpose. Amateur model 515 designed for the amateur who demands a durable heavy-duty speed key.

Practice sets, weights for hi-speed key, knobs, etc., may also be obtained from this company. — *Radio Retailing*, January, 1937.



### NATIONAL

National Company, Inc., 61  
Sherman St., Malden, Mass.

**Model:** Cathode ray oscilloscope.

**Description:** Designed especially for ham operation. Built around the new RCA 913 tube; self contained; 4½x6½x8 in.; readily portable; ideal for transmitter adjustment and modulation checking.

The one-inch viewing screen is ample for ordinary work such as checking receivers and transmitters. A self-contained 60 cycle sweep is provided, or, if desired, an audio signal from the apparatus under test may be used.

**Price:** \$11.10, net, less tubes. — *Radio Retailing*, January, 1937.

### FERRANTI

Ferranti Electric, Inc., 30  
Rockefeller Plaza, New York,  
N. Y.

**Device:** R. F. voltmeter.

**Description:** May be used on power, audio and radio frequencies up to 1500 kc. Employs electrostatic construction, consumes no energy whatsoever and is entirely independent of temperature, frequency and wave form. Particularly valuable in making accurate measurements on high impedance circuits or measuring the voltage in tank circuit of a radio transmitter.

May be directly connected to a.c. or d.c. circuits up to 3500 volts. Three standard dials—2½, 3½ and 4 in. and available in three patterns—flush or projecting for switchboard mounting and portable type for laboratory use. Two special models also available.—*Radio Retailing*, January, 1937.

### AUTODIAL

International Business Machines Corp., 270 Broadway,  
New York City, N. Y.

**Model:** Autodial Selective Talking and Selective Ringing Service.

**Description:** System allows as many simultaneous conversations as there are pairs of phones.

"Conference" call service may be had. Each person wishing to attend the "conference" dials a particular number. When all have complied the "conference" may begin.

This system greatly facilitates prompt and efficient handling of interdepartmental communications. Also applicable for home or residence use.

Instruments come in black although they may be had in different colors at an additional cost.—*Radio Retailing*, January, 1937.



### CORNELL DUBILIER

Cornell-Dubilier Corp., South  
Plainfield, N. J.

**Devices:** Capacitors; condensers.

**Description:** Dry electrolytic capacitors for a.c. applications where high capacity is necessary for intermittent use. Designed and constructed along lines that allow for rapid heat radiation and dissipation. Especially suited for use in connection with fractional horsepower motors of the type used in refrigerators and oil burners.

The hermetically sealed condensers, impregnated and filled with Dykanol, are enclosed in non-corrosive containers in a multitude of sizes and shapes. Especially suited for use where space and carrying weight are at a premium.—*Radio Retailing*, January, 1937.



### TRANSTAT

American Transformer Co.,  
178 Emmet St., Newark, N. J.

**Device:** Voltage regulator.  
**Description:** An improved voltage regulator for alternating current circuits which offers the same control as obtained from a rheostat plus the high efficiency, good regulation and great flexibility of an auto transformer. Available in various standard sizes for controlling voltage to loads up to 2.5 kva. on either 115- or 230-volt lines. Also capable of stepping up the output to values considerably higher than line voltage. May be used with electrical equipment as a control of voltage, illumination, motor speed or heat.—*Radio Retailing*, January, 1937.

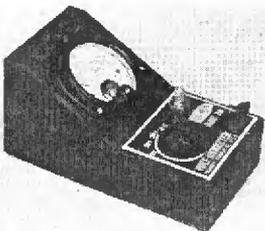
### TRIUMPH

Triumph Mfg. Co., 4017 W.  
Lake St., Chicago, Ill.

**Models:** Volt-ohmmeter, a.c. signal generator, Model 300 multi-range meter.

**Description:** Pocket size volt-ohmmeter—weight 20 oz.; selective range switch; direct reading scales; 0-10, 0-100 and 0-500 volts, d.c.; 0-1,000 and 0-500,000 ohms; inverse low resistance range.

A.c. signal generator, measures receiver sensi-

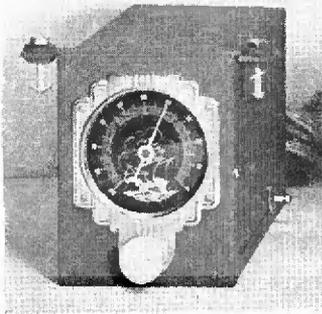


tivity, stage gain, translation gain, selectivity; checks a.v.c. and q.a.v.c. action, microphonics, weak or defective tubes, open bypass condensers, defective

receiver parts, speaker rattles, etc. In addition it will demonstrate radio sets; operate with oscillographs. Calibrated from 100 kc. to 75 mcs.

Multi-range meter, eliminates pin jacks, operating with one selector switch; 11 ranges; D'Arsonval meter movement. Measures d.c. voltage ranges 0-10, 0-100, 0-500, with d.c. sensitivity of 1,000 ohms per volt. A.c. voltage ranges, 0-10, 0-500, 0-1,000 with a sensitivity of approximately 350 ohms per volt; d.c. current ranges, 0-50, 0-500 m.a.; resistance ranges: 0-1,000, 0-1 meg. and 0-10 megs.

**Prices:** Volt - ohmmeter, \$7.85; signal generator, \$23.95; multi-range meter, \$15.95; all prices f.o.b. factory. — *Radio Retailing*, January, 1937.



### ABC RADIO LABS.

ABC Radio Laboratories,  
3334 N. New Jersey St.,  
Indianapolis, Ind.

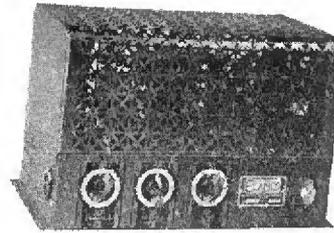
**Device:** Shortwave converters for auto-radios.

**Description:** Two metal tubes used, one providing r.f. amplification of shortwave signals, the other a signal which may be picked up by the receiver at 600-700 kc.

Wavebands available are: Model 500, 1600-6000 kc.; Model 600, 6000-18000 kc. Distance range of from 6000-12000 miles possible with Model 600 it is claimed. Regular broadcast reception is not affected when converter is not in use.

Calibrated aeroplane and vernier tuning dials and edge-of-instrument panel installation make units easy to tune and install.

**Prices:** 500, \$21.95; 600, \$24.95.—*Radio Retailing*, January, 1937.



### ELAMCO

Electric Amplifier Corp., 135  
W. 25th St., New York, N. Y.

**Device:** Amplifiers.

**Description:** Group consists of six amplifiers with power range from 6.5 to 28 watts. Constructed on heavy 18-gauge steel chassis.

Type 13-C, illustrated, delivers 28 watts obtained from two 6L6 tubes in push-pull. The output circuit is multiple impedance. The input circuit is for a high impedance crystal, sound cell, velocity, etc., microphone. This may be mixed with either high level device connected to two position fader. Over-all tone control is provided. — *Radio Retailing*, January, 1937.

### HEINEMANN

Heinemann Electric Co.,  
Trenton, N. J.

**Device:** "Re - Cirk - It" breaker.

**Description:** Fully-magnetic, non-thermal device available in capacities ranging from 50 ma. to 35 amps. Provides protection for delicate tube filaments and associated equipment. Has a tumbler handle switching current on and off under normal circuit conditions. Two types: instantaneous trip and time-delay action.

Bakelite enclosed. Both exposed and behind-the-panel mountings available, as well as 2 and 3 pole units in steel safety cabinets. — *Radio Retailing*, January, 1937.

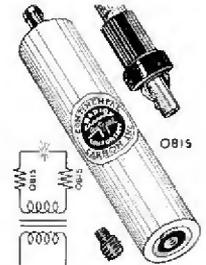


### CONTINENTAL CARBON

Continental Carbon, Inc.,  
13900 Lorrain Ave.,  
Cleveland, Ohio

**Device:** Oil burner ignition interference suppressor.

**Description:** Intended for use in series with each high tension lead of an oil burner's ignition system. The suppressor, which has a resistance of 15,000 ohms, damps transient radio frequency oscillations in the high tension circuit, reducing ra-



dio interference. A solderless cable terminal is provided at one end. A universal type threaded stud and double threaded brass insert in the suppressor permit convenient connection to practically all standard ignition transformers. This device will be known as Filternoys Suppressor OB15.

**Price:** \$1.50.—*Radio Retailing*, January, 1937.

### MAGNAVOX

Magnavox Co., Ft. Wayne,  
Ind.

**Models:** 505 DC and 525 AC speakers.

**Description:** Two new heavy duty 15-in. models designed especially for deluxe radio, electric phonograph and public address installations.

Amplitude distortion and cone breakup have been reduced and power handling capacity increased by means of a heavy duty 2 in. voice coil working in conjunction with a high efficiency magnetic circuit and a 15-in. diameter curvilinear diaphragm.

Available in three models.—Standard covering a frequency range up to 5000 cycles; high frequency, up to 8000 cycles, low frequency, 30 to 2500 cycles.

**Prices:** 505 DC, \$42.50; 525 AC, \$55.—*Radio Retailing*, January, 1937.

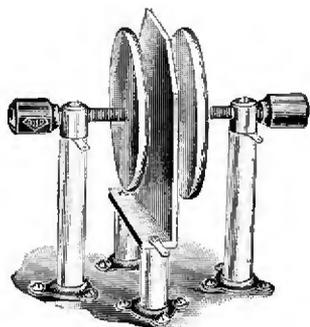
## KATO

*Kato Engineering Co.,  
Mankato, Minn.*

Device: Aircharger.

**Description:** 32-volt, 800 watt step-up drive air-charger. Capacity of 800 watts is reached in a wind of only 20 miles per hour. The unit cuts in and begins charging in a 6-mile an hour wind. Equipped with a generator; driven by a four-blade 10-ft. diameter propeller, connected to the generator by multiple V-belts. The turntable is free-swinging, fast in action, as it is mounted on ball bearings. The two main mast types are made of welded seamless steel tubing.

Price: \$186—*Radio Retailing*, January, 1937.



## BUD

*Bud Radio, Inc., 1937 E. 55th  
St., Cleveland, Ohio*

Device: Ultra-high frequency tuning condenser.

**Description:** Constructed of aluminum plates with highly polished surfaces. The two round plates are  $2\frac{1}{8}$  in. in diameter and  $\frac{1}{8}$  in. thick with rounded edges to minimize corona effect. Both plates are mounted on Isolantite pillars and very long threaded shafts attached to these plates make possible a wide range of capacity variation. The center plate is also mounted on Isolantite pillars but is fixed in position.

For use in either a split or conventional tank circuit tuning above 56 mc. May also be easily adapted for use in a parallel plate oscillator.

Price: \$5.—*Radio Retailing*, January, 1937.



## MILLION

*Million Radio & Television  
Laboratories, 377 W. Superior  
St., Chicago, Ill.*

Device: Circuit tester, Model VM.

**Description:** AC volts, 0-1.5. 15, 150, 300, 600.

DC volts, 15, 150, 300, 600.

DC M.A., 0, 1, 30, 300. Ohms, 0, 3M, 300M and 3 megohms.

Knife edge pointer; large  $3\frac{1}{2}$  in. meter, 1000 ohms per volt; metal case. Size 5x8x3 in.

Price: \$18.95.—*Radio Retailing*, January, 1937.

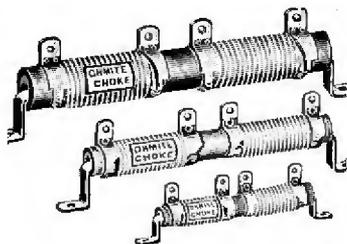
## OHMITE

*Ohmite Co., 4835 W. Flournoy  
St., Chicago, Ill.*

Device: Power line choke.

**Description:** Primarily designed for use on amateur radio transmitters to prevent the interference which they may cause to owners of radio receiving sets in their immediate neighborhood, in so far as such interference may be fed back out over power lines.

One of these chokes,



however, is also specifically designed to be used on radio receivers to prevent interference of radio frequency from coming in to such sets over house lines and power lines from nearby sources. Will not prevent interference of audio frequency and are not recommended for this purpose.—*Radio Retailing*, January, 1937.



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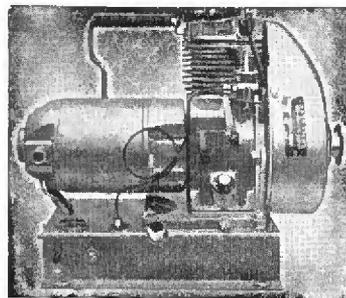
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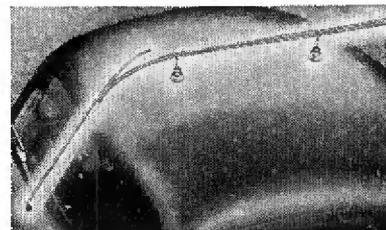


6 V. 150 watt.....	\$49.95
12 V. 200 watt.....	59.95
32 V. 300 watt.....	72.00
110 V. 300 watt A. C.	87.50
110 V. 350 watt, A. C.	
Self-cranking.....	98.00

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**MODEL A.L.T.—The "All-Range"**—List Price \$4.25—For cars with windshields that open—Also **MODEL A.L.** for windshields that do not open. No drilling in top necessary. Fits all cars.

**MODEL F.L.—The "Flex-Rod"**—List Price \$3.50—Sensational Hinge Aerial—Fits all cars—Flexible—Efficient—No drilling.

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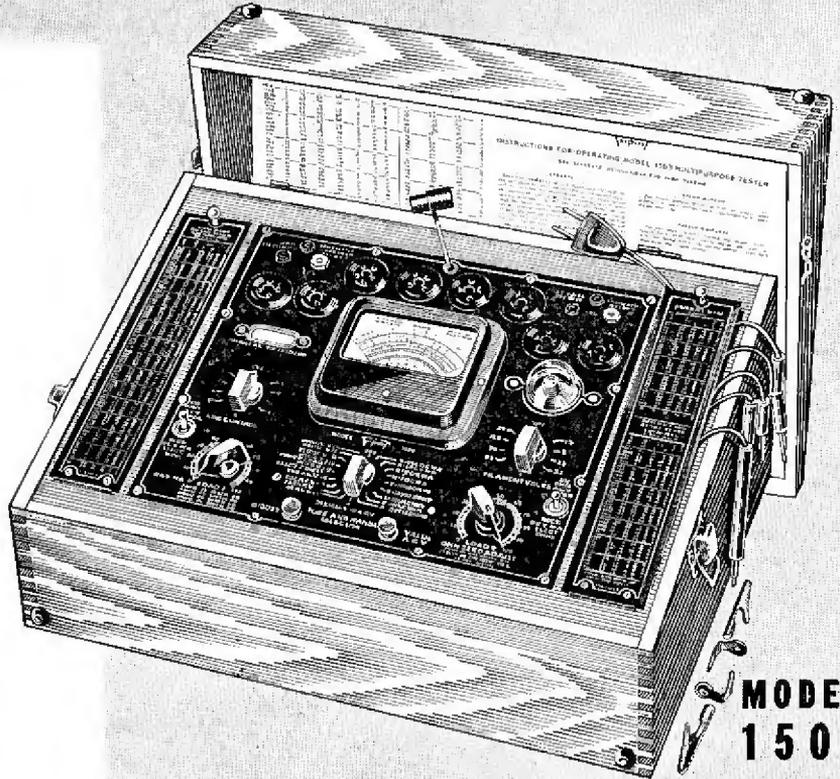
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WARD BUILDING CLEVELAND, OHIO  
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# Give It A Full Test



Normally the function of most tubes is to amplify a signal. But when tubes are required to deliver power, such as the 6F6, the amplification may test up and yet the tube may distort badly. Reason . . . weak emission . . . particularly at low frequencies. Such tubes demand both amplification and emission test, now available



**MODEL 1503**

## on The P.O.E. Tester

(Patented Sept. 15, 1936)

Radio tubes have three different functions: to amplify, to deliver power, to rectify.

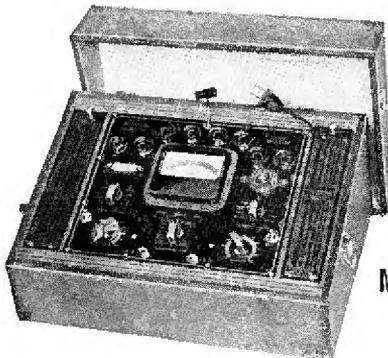
For Amplifiers (75% or more of all tubes) the Power Output Test is absolutely the final word in determining the worth of the tube. The Power Output Test in Triplet P.O.E. Tester simulates actual operating conditions in the radio set. For Power Tubes, the Power Output Test determines the amplification factor. The emission test determines the power handling ability. Both tests are necessary to properly analyze these tubes, available only in the P.O.E. Tester.

The function of the Diode tube is to rectify. Here the emission test only is made to determine the condition of the tube. P.O.E. tests these under both voltage and current load. The proper high voltages used in the P.O.E. Tester will detect any flash overs. Model 1503 combines all the required servicing instruments in one.

- |                                               |                                         |
|-----------------------------------------------|-----------------------------------------|
| 1. Power Output Test for All Amplifying Tubes | 6. D.C. Milliammeter                    |
| 2. Emission Test for All Tubes                | 7. A.C. Voltmeter                       |
| 3. Neon Short Test                            | 8. Ohmmeter                             |
| 4. Separate Diode Test                        | 9. Condenser Test for Shorts            |
| 5. D.C. Voltmeter                             | 10. Electrolytic Condenser Leakage Test |
|                                               | 11. Decibel Meter                       |

Complete in quartered oak case with all necessary accessories. **DEALER PRICE \$46.67.**

Model 1504 is same as 1503 except has addition of Free Point Tester permitting complete set testing. **Dealer Price \$56.67**



**MODEL 1502**

P.O.E. Tube Tester—tests all types of tubes. Tube values are indicated on GOOD-BAD Instrument Scale.

Has shadow-graph line voltage indicator. Neon inter-  
element short test made while tube is hot. When new  
tubes are released, up-to-date tube charts are provided  
for all Triplet Tube Testers.

Complete in quartered oak case with all necessary acces-  
sories. **Dealer Price \$36.67**

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The Triplet Electrical Instrument Co.  
201 Harmon Ave., Bluffton, Ohio

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Model 1502. .... I am also interested in.....

Name .....

Address .....

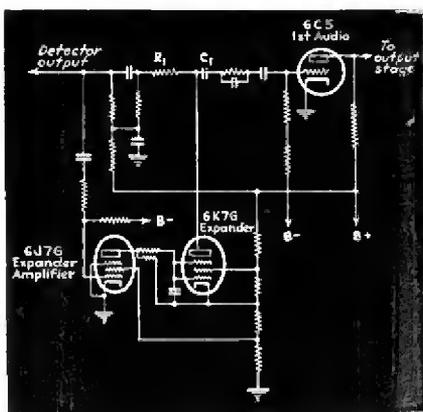
City ..... State.....



# SERVICE

DESIGN • REPAIRS • INSTALLATION

## New Circuits



### Expander Design

From Sparton's engineers comes the following volume expander circuit.

A type 6J7G, fed from the detector circuit amplifies the audio variations of the received signal. This tube is so connected to the 6K7 expander that these audio variations control the bias on the 6K7. When the bias is high, as it is when a loud signal passes through the detector, the expander tube draws little plate current. Under these conditions its plate resistance is very high. However, when only a small amount of bias is impressed on its grid, the plate current rises, and the plate resistance decreases accordingly.

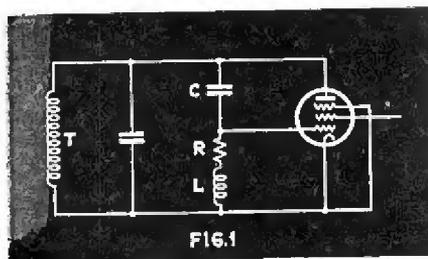
In operation, if the plate resistance of the expander tube is infinite, its effect on the circuit can be disregarded and therefore full audio voltage will be delivered to the type 6C5G first audio grid. If on the other hand, the plate resistance of the type 6K7G tube approaches or becomes equal to the resistance of  $R_1$ , it leaves the grid of the type 6C5G tube connected midway across a "volume control," wherein resistor  $R_1$  and the plate resistance of the type 6K7G tube are equal. Therefore, only half of the audio voltage will be applied to the grid of the type 6C5G tube. Similarly, if the 6K7G plate resistance was made much less than the resistance of  $R_1$  most of the voltage drop across the net work would be

across resistor  $R_1$  and very little audio effect will be impressed on the grid of the type 6C5G tube.

### Automatic Selectivity Control

Selectivity can be controlled electronically by using a tube as a variable reactance as pointed out by G. E. engineers.

To illustrate, if a tube were connected across a tuned circuit, such as in Fig. 1, it would have the equivalent effect as a shunt capacity. The result would be a lowered resonant frequency of the tuned circuit. However, if the circuit shown in Fig. 2 is used, the action would be similar to a shunt inductance, increasing the frequency. In



each case, the capacity or inductance effect is variable.

In applying these circuits to a detuning system of automatic selectivity control, the primaries of all I.F. transformers are detuned in one direction, the secondaries in the other. Then only one control voltage is necessary to swing the grids of the controlling tubes.

The control voltage is obtained from the rectified signal. Hence for strong signals, a broad curve is obtained, which will pass a sufficient amount of high frequencies for high fidelity reception. At the same time the gain of the controlled stages is reduced by the detuning. This prevents overload of detector and avc. stages. On weak signals the gain is maximum and selectivity

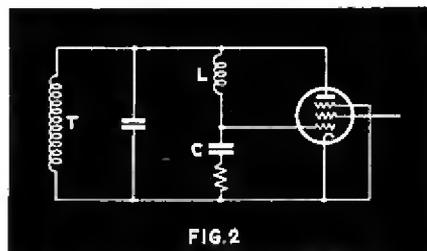


FIG. 2

is high, therefore the extraneous noises are reduced by the cutting of the high frequency sidebands. High fidelity on these stations is, of course, not desirable.

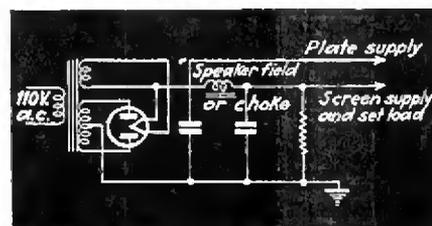
### Simplified Amplifier Regulation

Plate voltage for the output stage of an audio amplifier may be obtained from the rectifier filament without the necessity of the usual filter choke.

In Class AB and Class B amplifiers, large changes in plate current are not uncommon. Any slight resistance in the filter network will cause the plate voltage to fluctuate with these changes.

The greatest power supply resistance is introduced by the filter choke. However, since output stages have little gain in themselves this choke may be disregarded, as any small ripple in the power supply will produce very little current in the load resistance. The filtering of the input condenser is usually sufficient to keep the hum at a low level.

Screen voltage can then be supplied through a smaller choke since the screen current is small and chances of saturation of this choke greatly reduced.



RECTIFIED RF SIGNAL CURRENT  
HIGH-MU TRIODE PLATE VOLTAGE

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DIODE BALANCING CIRCUITS

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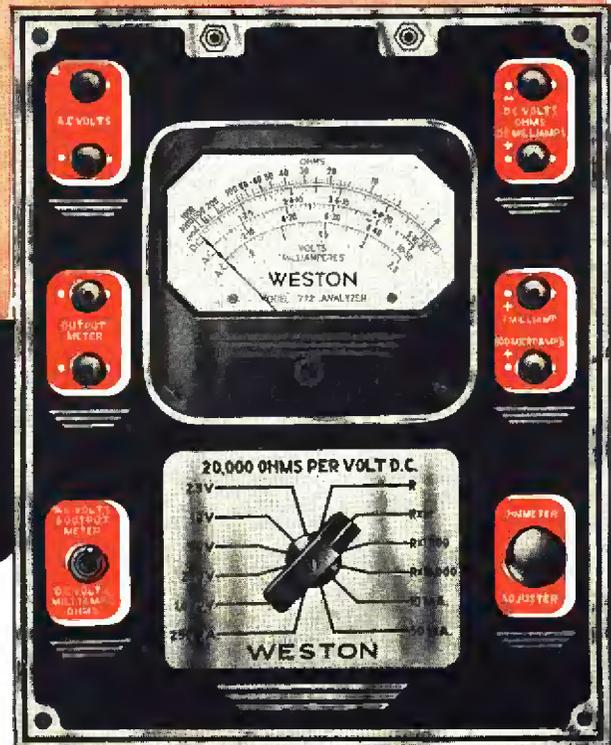
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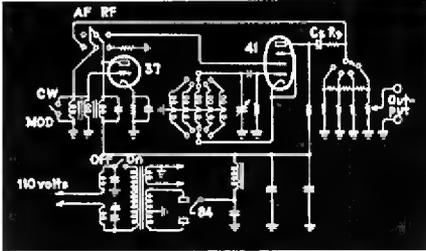
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## Test Oscillator

Novel circuit design is incorporated in an all wave signal generator by Monarch.

A 41 tube in an electron coupled circuit delivers an output voltage of 0.1 volt from 100 kc. to 30 mc. in five band positions. Modulation of the signal at 400 cycles is accomplished by a '37, connected so that its output can be



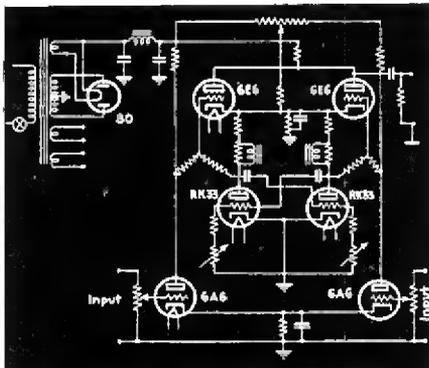
disconnected from the oscillator when a C.W. signal is desired, or the audio output of this tube used separately.

An unusual method of attenuation is employed. A network of voltage dividers, one of which is a potentiometer, allows the output to be varied in one position from zero to full signal, while in the three other positions the signal can be reduced to a small fraction of the total output. At the same time a fairly even load for the tube is always present. R. F. chokes are included in the 110 v. line to reduce any chances of radiation from this source. Thus the signal can only be obtained from the output terminals which are always under control of the potentiometer.

## Electronic Switch

A new instrument for attachment to cathode ray oscillographs permits simultaneous observation of both input and output voltages of an audio amplifier on the same screen. Any similar problem where two voltages are to be compared can also be solved by placing one pattern on the other. Slight amounts of phase shift or distortion can readily be detected by this method.

Developed by DuMont, the device



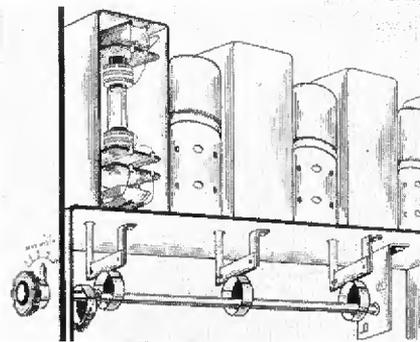
operates on the electronic principle, there are no moving or vibrating parts. It consists of a switching tube and two separate amplifiers. The switching tube operates to cut in one amplifier, then the other, at such a rate that the two phenomena appear at the same time.

Separate controls are provided for adjusting the gain of the amplifiers so that each voltage can be given the same amplitude. A control is also included for varying the speed of the switching.

## Side Band Control

While side band control is not new to receiver design, a panel controlling device calibrated in kc. is a considerable improvement over previous band widening methods.

In the new Hammarlund superhet, a single knob actuating a system of cams permits a wide range of coupling between primary and secondary windings of the I.F. transformers. When high selectivity is desired, the knob is



rotated to give a 3 kc. band width. In this position the windings are widely separated and a sharp resonance curve produced. For broadcast reception, where high fidelity is important, a width of 16 kc. can be obtained. The I.F. windings in this case are close to each other, allowing the circuit to be over-coupled.

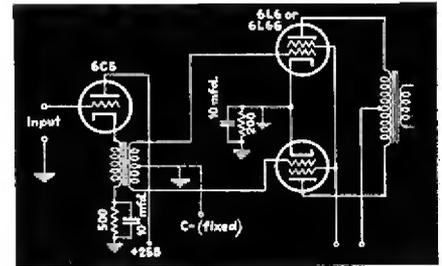
With a device of this type, the receiver is made to provide maximum results whether it be used for communications or broadcast reception.

## Degenerative Driver

Degeneration may be introduced in the driver stage of a Class AB2 amplifier when high quality output is desired. Even though the tubes in the output stage itself may be characterized by inherent low distortion, the amplifier output may be seriously affected by distortion introduced from an improperly designed driver stage.

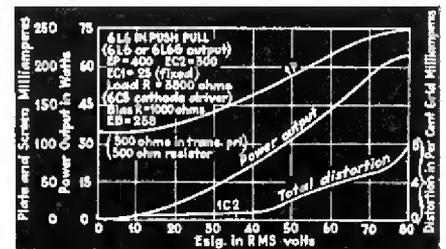
When driving such grid circuits, it is desirable to connect the primary of

the driver transformer in the cathode lead of the driver tube. This transformer should follow the same conventional design for Class AB2 driver transformers, namely, slightly less than one to one ratio. In addition, a suitable resistor should be connected in series with the primary to obtain the required



bias for the 6C5. Manufacturer's rating as to plate and grid voltage and plate current should be adhered to in all cases.

Since this type of amplifier is degenerative, the signal input to the driver grid circuit is necessarily much larger than when usual practice is employed. Nevertheless, the low distortion and low output impedance contribute to improved performance. Tests by Sylvania show that outputs as high as 73 watts can be obtained from two 6L6 tubes with fixed bias before grid current was drawn with this type of driver circuit. At this point the input voltage was 75 volts and the distortion approximately 5.5 per cent. Outputs in the vicinity of 45 watts were obtained with self bias.



## Auto Antenna Tester

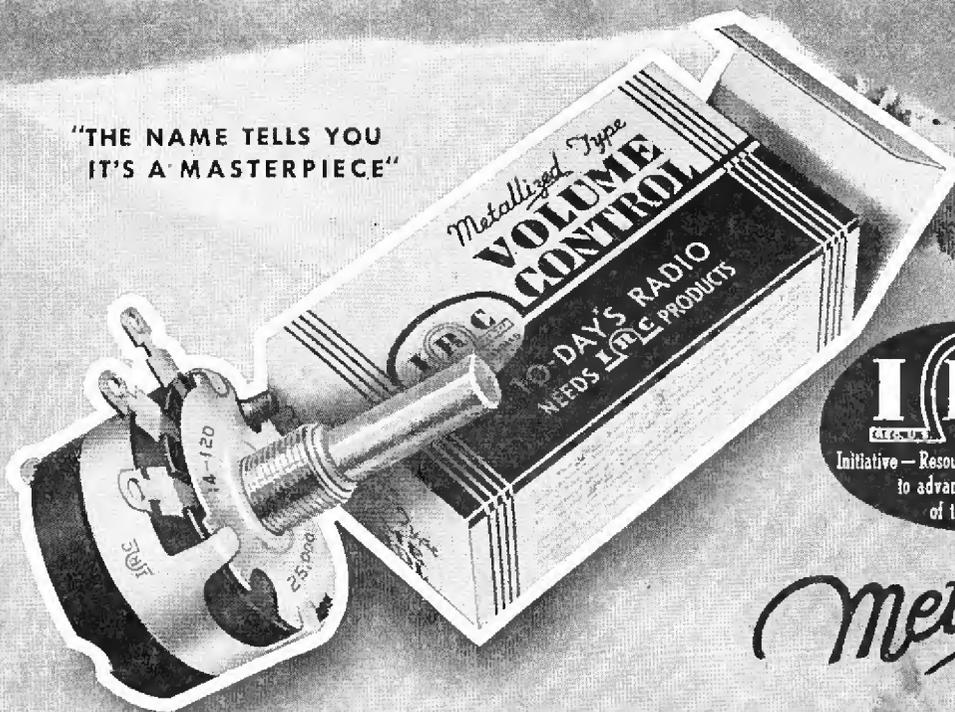
To facilitate checking faulty auto antennas, a capacity bridge circuit has been developed by Potter.

The capacity and resistance of any antenna can be found by connecting the antenna and ground as indicated in the circuit diagram and pressing the push button. This caused a loud buzzing signal to appear in the phones. By rotating the potentiometer knob the signal can be made to disappear at one point. A calibrated scale on the potentiometer will then indicate the capacity of the antenna network.

If this reading falls between zero and 100 mmf, the antenna is too small. If, however, readings of 750 to 10,000 mmf are indicated, too much capacity to

# QUIET PERMANENT RUGGED

"THE NAME TELLS YOU  
IT'S A MASTERPIECE"



*Metallized*

## VOLUME CONTROL

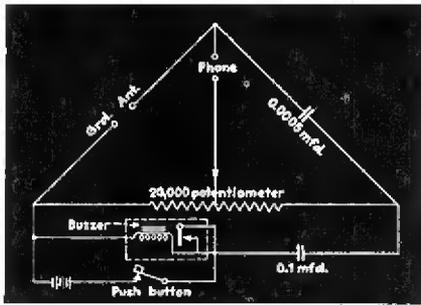
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the car body for satisfactory signal pickup is in evidence. Low resistance shorts show up when the audio note in the phones reaches a minimum but does not disappear completely. For best re-



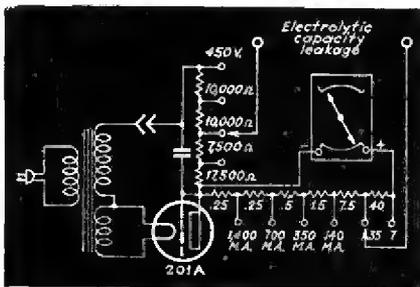
sults, the antenna should have a capacity between 200 and 500 mmf.

This unit operates as a true bridge circuit and can be used to check various capacitors up to 10,000 mmf. The buzzer which is powered by two flashlight batteries provides the necessary signal, indicating when the circuit is in balance.

### Electrolytic Tester

In checking electrolytic capacities for leakage, erroneous results are sometimes obtained since the leakage only occurs at the rated voltage of the condenser. In the supreme capacity checker various voltage tests from 175 volts to 450 volts are available.

A 201A tube operates as a half wave rectifier delivering 450 volts. A single capacity, to act as filter, shunts this



voltage. The vertical group of pin jacks permit the operator to choose the desired voltage for the condenser under test. The correct current range is chosen on the horizontal set of jacks.

In operation, the condenser is shunted across the two top terminals, the meter is then read for leakage. The recommended permissible leakage is 1 ma. per rated microfarad.

It might appear that there is no protection for the meter in this circuit. However, if the current range is set on a high range for the first test, the meter will not be driven off scale if the capacitor is short circuited.

### New Tubes

**6V6G.** A beam power amplifier similar to the 6L6. Designed primarily for auto radios, its power sensitivity is approximately double that of the conventional pentode while plate efficient is increased about 30 per cent. Filament current is .45 amp.

#### Push Pull Class AB Operation

Plate Voltage.....	250	300
Screen Voltage.....	250	300
Grid Voltage.....	-15	-20
Peak Signal Volts Grid to Grid .....	21.2	28.2
Static Plate Current.....	70	78
Full Signal Plate Current...	79	90
Static Screen Current.....	5	5
Full Signal Screen Current...	12	13.5
Load Resistance Plate to Plate	10,000	8,000
Power Output.....	8.5	13.0
Third Harmonic.....	3.5	3.5
Total Harmonic Distortion...	4	4

**5U4G** A full wave high vacuum rectifier similar to the 5Z3

Filament Voltage AC.....	5.0
Filament Current.....	3.0
A-C Voltage per Plate (RMS).....	500
D-C Output Current.....	250

#### 6P7G Pentode Triode

	Triode	Pentode
Heater Voltage.....	6.3	6.3
Plate Voltage.....	100	250
Grid Voltage.....	-3	-3
Screen Voltage.....	100	100
Plate Current.....	3.5	6.5
Screen Current.....	1.6	1.5
Plate Resistance.....	16,300	290,000
Amplification Factor...	8.5	300

#### Converter Service

	Triode	Pentode
Heater Voltage.....	6.3	6.3
Plate Voltage.....	100	250
Grid Voltage.....	-10	-10
Screen Voltage.....	100	100
D-C Plate Current.....	2.4	2.8
D-C Grid Current.....	0.15	0
Screen Current.....		0.6
Plate Resistance.....		2
Oscillator Peak Input.....		7
Conversion Transconductance..		300

**25A7G** A power pentode similar to a 43 and a rectifier of the 12Z3 type

Heater Voltage.....	25.0
Heater Current.....	0.3

#### Pentode Section

Plate .....	100
Screen Grid.....	100
Control Grid.....	.15
Plate Current.....	20.5
Screen Current.....	4
Amplification Factor.....	90
Plate Resistance.....	50,000
Mutual Conductance.....	1,800
Load Resistance.....	4,500
Total Harmonic Distortion.....	.9
Power Output.....	.77

#### Rectifier Section

AC Plate Voltage (RMS).....	125
DC Output Current.....	75

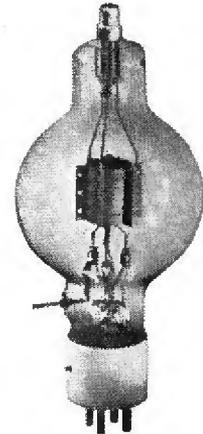
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#### CHARACTERISTICS

Filament Voltage.....	5 to 5.1 volts
Filament Current.....	6.5 amperes
Amplification factor.....	30
Grid-plate capacity.....	2 mmfds.
Grid-filament capacity.....	2.2 mmfds.
Plate-filament capacity.....	3 mmfds.
Maximum plate voltage.....	3,000
Maximum plate current.....	225 milliamperes
Maximum grid current.....	50 milliamperes
Plate dissipation.....	100 watts

**"Q" Measurement**—The "Q" of circuit is determined largely by the type of wire insulation. Test made by Boonton engineers indicate that 24 hours exposure to humidity is sufficient to cause considerable change.

Enamel insulation shows a relatively small drop in insulation value, from a circuit "Q" of 225 to slightly under 200 in 24 hours. Silk drops from 190 circuit "Q" to 110. Cotton insulation in a few hours drops from 165 to 10 or less.

Test samples of the three types of insulation were made by twisting together pairs of the same wire about 4 inches long for about half their length, leaving 2-inch leads for connecting across the measuring circuit of a Q-meter. These twisted pairs formed small condensers having a capacitance of a few micro-microfarads, a large part of which was in the insulation of the wire. The capacitances were adjusted to the same value by clipping off the twisted ends. Test samples were measured at room conditions, and then placed in a small dessicator cabinet in which the air was maintained at 90% humidity.



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# Oscillograph Design For the New 913

By L. C. Waller

RCA Radiotron Div., RCA Mfg. Co., Harrison, N. J.

**N**OW that an inexpensive, midget cathode-ray tube is available, no radio service engineer need longer be without a cathode-ray oscillograph. The new 913 is especially suited for service applications, for either portable or shop use. Outstanding characteristics are its small size and low voltage requirements. Less than five inches long and having a viewing screen about one inch in diameter, the 913 will provide a bright image of greenish hue with an anode No. 2 voltage as low as 250 volts; it can be operated with an annode supply as high as 500 volts.

Two views of the typical oscillograph to be described are shown in Figure 2. As can be seen from the schematic diagram in Figure 3, as well as by the eleven variable controls on the front panel, this particular design has many features found in present commercial instruments using larger cathode-ray tubes. In spite of this fact, the portable oscillograph as constructed is only 8½ in. high, 6 inches wide, 10 inches long, and weighs less than 17 pounds.

## Design

An oscillograph, to be of general utility for many diversified applications, should include a linear time-sweep oscillator of variable frequency and variable voltage output. These features are provided by the gas triode, type 885, in conjunction with a sweep-voltage amplifier, type 57. The 885 operates as a relaxation oscillator, producing the familiar saw-tooth voltage wave form necessary for the linear time-sweep. The fundamental frequency of the saw-

tooth oscillator is adjusted in steps by means of the 8-contact, single-pole switch ( $S_2$ ) and condensers  $C_2$  to  $C_8$ . The vernier frequency control is potentiometer  $R_2$ , in the plate circuit of the 885. The frequency range provided by  $R_2$  is adequate to cause a frequency over-lap as the capacitance-selector switch is moved between adjacent points. The total range of the oscillator is approximately 30 to 18000 cycles per second. The linearity of the output voltage is quite good between 30 and 7500 cps—a sufficient range for most service applications.

The voltage output of the 885 is fed, through switch  $S_3$ , to the sweep-voltage amplifier, which is a pentode-connected 57. Because the peak voltage required by the 57 is considerably less than that delivered by the 885, a voltage divider consisting of  $R_3$  and  $R_4$  is employed. Potentiometer  $R_5$  provides the variable sweep-voltage control for the horizontal deflecting plates. The output of the sweep amplifier is fed to horizontal deflecting plate  $D_1$ , through d-c blocking condenser  $C_3$ , and switch  $S_4$ . In case it is desired to amplify an external sweep voltage, the input to the sweep amplifier is switched to the binding post marked "Ext. Sweep Amp." by means of switch  $S_2$ .

Provision for "locking" the sweep oscillator with the line voltage or with an external voltage is made by means of switch  $S_1$ . Usually, one volt or less is sufficient for this purpose, if the main frequency controls are properly adjusted. The impedance (determined mainly by  $R_1$ ) of the 885 input circuit is relatively high, so that in many

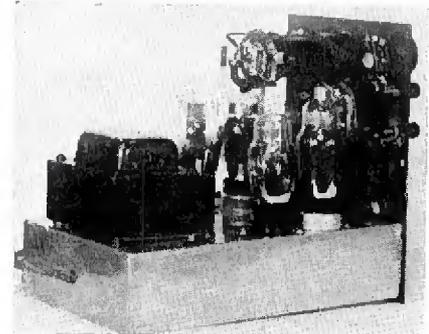
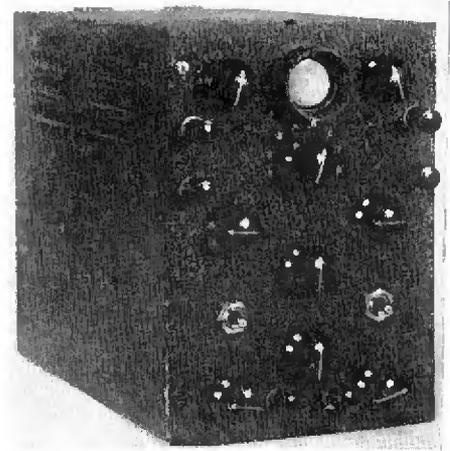


Fig. 2—Front and side views of the portable oscillograph.

cases the binding posts "Ext. Sync." can be connected directly to the signal voltage applied to vertical deflecting plate  $D_2$ , whether this voltage is amplified by the signal amplifier, or connected through input terminal  $D_3$  which cuts out the signal amplifier. In any case, control  $R_1$  should always be set for as little voltage as possible for correct operation. Too much "locking" voltage reacts unfavorably on the time-sweep voltage produced by the 885.

Fixed bias for the 885 is obtained from bleeder resistor  $R_{20}$ . The value of the bias voltage is rather critical, in this particular circuit, and should be checked carefully. If the bleeder current is correct (about 4 ma.), the recommended value of  $R_{20}$  will give the proper bias voltage of 6.5 volts.

In many cases, the signal voltage available for the vertical deflecting plates is too small to provide a useable deflection on the screen of the cathode-ray tube. For this reason, a second 57 is employed in an amplifier circuit identical to the one used for the time-sweep

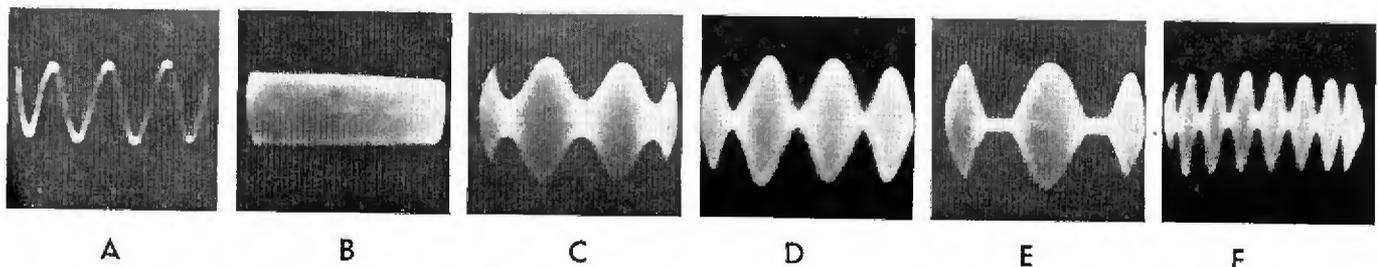
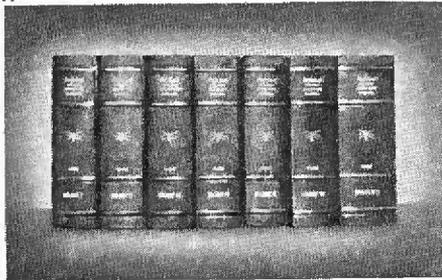


Fig. 1—These oscillograms are from actual, unretouched photographs of patterns on the viewing screen of the 913, in the oscillograph described. See text for explanation of patterns.

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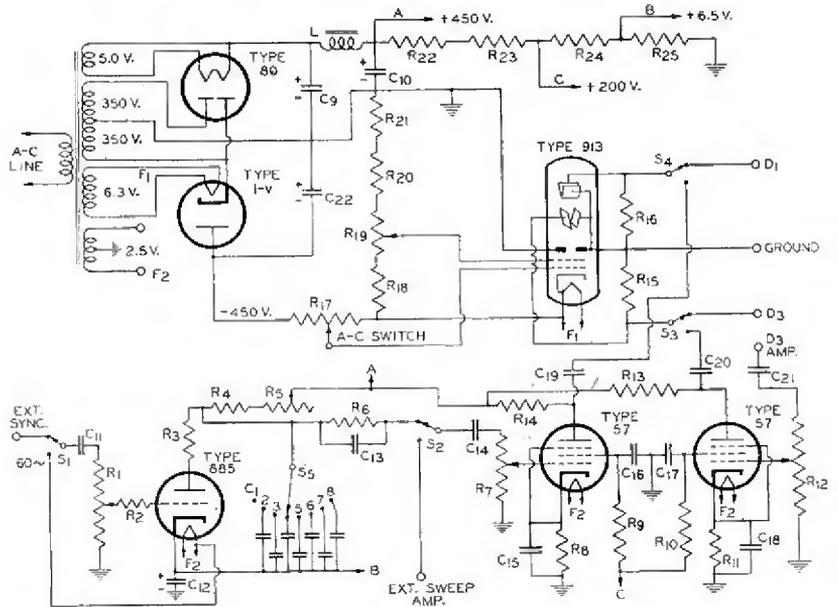


Fig. 3—Schematic circuit of the oscillograph. Many of the circuit constants given are somewhat critical.

voltage. The signal amplifier furnishes a "vertical" deflecting voltage to deflecting plate D<sub>3</sub>, through C<sub>20</sub> and S<sub>4</sub>. Circuit constants of the above diagram are as follows:

- C<sub>1</sub> = Stray Circuit Capacity.
- C<sub>2</sub> = 0.0008 uf, 500 V.
- C<sub>3</sub> = 0.002 uf, 500 V.
- C<sub>4</sub> = 0.005 uf, 500 V.
- C<sub>5</sub> = 0.015 uf, 500 V.
- C<sub>6</sub> = 0.05 uf, 500 V.
- C<sub>7</sub> = 0.15 uf, 500 V.
- C<sub>8</sub> = 0.25 uf, 500 V.
- C<sub>9</sub> C<sub>10</sub> C<sub>19</sub> = 8 uf, 475 V. (working).
- C<sub>11</sub> C<sub>12</sub> C<sub>17</sub> = 0.25 uf, 250 V.
- C<sub>13</sub> = 25 uf, 15 V.
- C<sub>14</sub> = 25 uf, 500 V.
- C<sub>15</sub> C<sub>16</sub> = 0.5 uf, 500 V.
- C<sub>18</sub> = 0.003 uf.
- C<sub>20</sub> C<sub>21</sub> = 0.25 uf, 500 V.
- L = 30 Henries, 10 ma.
- R<sub>1</sub> = 250,000-ohm poten.
- R<sub>2</sub> = 25,000 ohms, 0.5 watt.
- R<sub>3</sub> = 500 ohms, 0.5 watt.
- R<sub>4</sub> = 300,000 ohms, 0.5 watt.
- R<sub>5</sub> = 2.0 megohm poten.
- R<sub>6</sub> = 1.0 megohm, 0.5 watt.
- R<sub>7</sub> R<sub>12</sub> = 0.5 megohm poten.
- R<sub>8</sub> R<sub>11</sub> = 1,000 ohms, 0.5 watt.
- R<sub>9</sub> R<sub>10</sub> = 200,000 ohms, 0.5 watt.
- R<sub>13</sub> R<sub>14</sub> = 100,000 ohms, 1 watt.
- R<sub>15</sub> R<sub>16</sub> = 2.0 megohms, 0.5 watt.
- R<sub>17</sub> = 15,000-ohm poten.
- R<sub>18</sub> = 15,000 ohms, 0.5 watt.
- R<sub>19</sub> = 25,000-ohm poten.
- R<sub>20</sub> R<sub>24</sub> = 50,000 ohms, 1 watt.
- R<sub>21</sub> = 40,000 ohms, 1 watt.
- R<sub>22</sub> R<sub>23</sub> = 30,000 ohms, 1 watt.
- R<sub>25</sub> = 1,600 ohms, 0.5 watt.

The frequency response of both amplifiers is practically flat from 20 to 20000 cps. At 70000 cycles per second, the voltage output is down about 50 per cent.

**Power Supply**

The power supply, employing an 80 and a 1-v, is of particular interest. The 80 is used in a full-wave rectifier circuit to supply about 450 volts above ground. A 1-v, in a half-wave rectifier circuit, supplies 450 volts below ground for the 913. A simple condenser filter, C<sub>9</sub>, is adequate. The values of the resistors and potentiometers comprising the bleeder for the 1-v provide a bleeder current of approximately 3 ma.

Potentiometer R<sub>17</sub> supplies a variable bias voltage to grid No. 1 in the cathode-ray tube; this voltage, variable from zero to -45 volts, regulates the intensity of the fluorescent pattern on the viewing screen. Potentiometer R<sub>19</sub> furnishes from 45 to 120 volts to anode No. 1; this is the control which focuses the electron beam so as to make a suitable spot on the viewing screen. The 1-v, which can be used with a heater-cathode potential difference as high as 500 volts, is operated from the same heater winding as the 913. It should be noted that the heater-cathode of the 913 is 405 volts below ground. In view of this fact, and the fact that the No. 1 grid may be as much as 450 volts below ground, it is advisable to incorporate an interlock switch on the lid of the cabinet so that the primary circuit of the power transformer is opened automatically when the lid is raised. This precaution will prevent the operator from getting unpleasant shocks when he accidentally touches one of the "hot" terminals on the 913 socket.

**Construction**

The chassis shown in Figure 2 measures 5 3/4 x 2 1/2 x 9 3/8 in. It consists of 1/8 in. aluminum stock, cut and bent by hand in order to fit the steel cabinet, which is 8 1/2 in. high, 6 in. wide, and 10 in. long. An aluminum chassis is used, both to facilitate drilling and to lessen the possibility of stray magnetic fields from the transformer disturbing the operation of the 913.

The octal socket used for the 913 has a ceramic body and a metal mounting plate, so arranged that the socket can be readily rotated in its mounting. The mounting plate can then be fastened rigidly to the mounting

brackets, which in turn are bolted to the panel. Figure 2 shows this arrangement. It is important that the socket be rotatable, so that the pattern on the viewing screen can be oriented properly.

A unique feature of the 913 mounting is the sliding light shield, made of bakelite tubing slightly larger in diameter than the screen end of the 913. This shield can be adjusted to protrude from the front panel from  $\frac{3}{4}$ " to 3", and is a valuable aid where observations must be made under a bright light. The light shield might also be made of an aluminum tube shield.

The filter choke (small, receiver-type), filter condensers, bleeder resistors, etc., are mounted underneath the chassis in the most convenient spots as regards circuit wiring. Condensers  $C_2$  to  $C_8$ , associated with the 8-point switch, are mounted directly behind the switch and under the 913. The 80 and the 1-v are placed next to the transformer, and the 885 between the two 57's. It was found necessary to cut away a portion of the front and top of the chassis in order to mount the toggle switches,  $S_1$  and  $S_2$ . Switch  $S_2$  can be seen in the chassis view of Figure 2, at the right of the 913.  $S_1$  is similarly mounted on the opposite side. The shield cans for the 57's were removed when the photograph was taken, in order to provide a better view.

The short leads from switches  $S_2$  and  $S_1$  to the deflecting plates can also be seen in Figure 2. These leads are kept as far away as possible from other parts of the oscillograph, to reduce their losses when r-f voltages are applied to the deflecting plates.

The panel layout of the various controls, is shown in Figure 4. The controls are identified as follows:

- (1) Intensity-control potentiometer,  $R_{17}$ , and also a-c line switch.
- (2) External synchronizing voltage input terminal.
- (3) External sweep amplifier voltage input terminal, connected to  $S_2$ .
- (4) Focusing potentiometer,  $R_{10}$ .
- (5) Switch,  $S_2$ .
- (6) Synchronizing voltage control,  $R_1$ .
- (7) Switch,  $S_1$ .
- (8) Signal-amplifier gain control,  $R_{12}$ .
- (9) Vernier control for linear-sweep frequency,  $R_8$ .
- (10) Sweep-amplifier gain control,  $R_7$ .
- (11) Ground terminal.
- (12) Rough control for linear-sweep frequency,  $S_3$ .
- (13) Signal-amplifier input terminal, "D<sub>3</sub> Amp."
- (14) Vertical-deflecting-plate input terminal, D<sub>2</sub>.
- (15) Horizontal-deflecting-plate input terminal, D<sub>1</sub>.
- (16) Switch,  $S_4$ .
- (17) Switch,  $S_1$ .

With reference to the orientation of the 913 socket (see Figure 5), pins 1 and 5 (looking at the bottom of the socket) are placed vertically, with pin 5 at the top. A slight rotation of the socket from this position should orient properly the vertical and horizontal deflection axes. Pins 4 and 6 (deflecting plates D<sub>1</sub> and D<sub>2</sub> respectively) will also be near the top of the socket.

### Operation

If all socket and bleeder voltages are found to be correct, the oscillograph is ready to be placed in operation as follows: Switch  $S_2$  (No. 5) is thrown to the linear-sweep position, which connects it to  $R_8$ . Switch  $S_4$  (No. 17) is also thrown to the linear-sweep position, which connects it to  $C_{10}$ . Control No. 12 (switch  $S_3$ ) is set to contact No. 8 (condenser  $C_8$ ). Controls Nos.

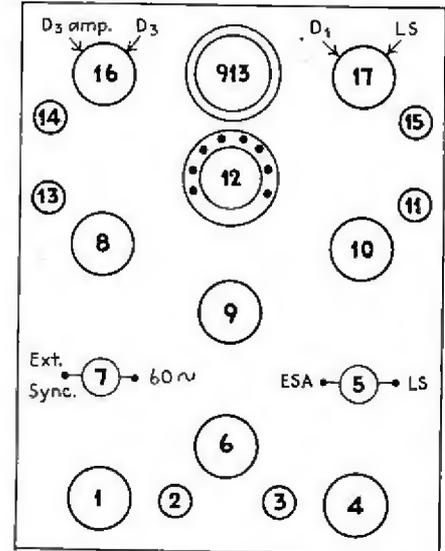
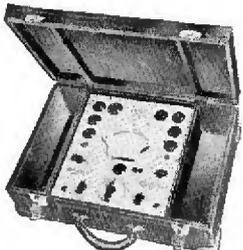


Fig. 4—Front-panel layout; see text for identification of controls.

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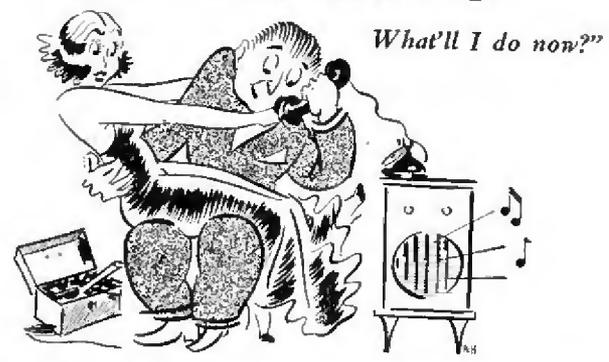
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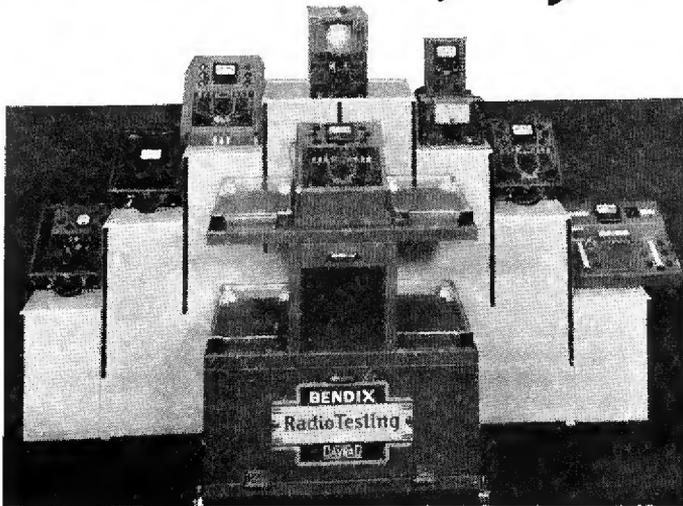
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9 and 10 are set about half way open. Control No. 1 is turned until the a-c line switch just snaps on. Intensity-control potentiometer  $R_1$  is now at the position of *Maximum bias*, at which setting the electron beam current is cut off while the cathode of the 913 is heating to normal operating temperature. After a delay of a few seconds, control No. 1 is advanced further (decreasing the bias on the No. 1 grid of the 913) until a horizontal fluorescent line is obtained on the viewing screen. The focusing control (No. 4) is next adjusted simultaneously with No. 1 until the fluorescent line is reduced to a narrow, uniform width. When controls Nos. 1 and 4 are properly adjusted, the intensity of the horizontal line should be just adequate for good vision. Excessive brilliance should be avoided, in order to avoid damage to the active screen material. In this regard, the operator should read carefully page 5 of the data booklet supplied with the 913 tube.

The length of the horizontal sweep line can be adjusted by means of sweep amplifier gain control No. 10. The line should vary from a point near the center of the screen to off-screen deflection at both ends, as control No. 10 is varied over its range. It is possible to distort the saw-tooth wave form of the linear sweep voltage if the sweep-amplifier gain control is advanced too

far, due to the fact that the 57 may be driven beyond the point at which d-c grid current starts. In general, the length of the sweep line is held to about 70 or 80 per cent of the diameter of the viewing screen.

Control No. 12 should next be tried at all positions from No. 2 to No. 8; control No. 9 is varied over its entire range at each setting of No. 12. At contact No. 2 (where control No. 12 puts in operation condenser  $C_2$ ) the sweep frequency is very high, so that the sweep line *will not extend completely across the screen*. At any particular setting of No. 12, vernier control of the sweep frequency is obtained by means of No. 9 ( $R_2$ ). When  $R_2$  is out of the circuit, the frequency is highest; when  $R_2$  is in the circuit, the frequency is lowest. If the desired sweep frequency cannot be obtained with No. 9, No. 12 must be moved to a different point. Point No. 8 and point No. 2 on switch No. 12 provide the lowest and highest frequency ranges, respectively. At point No. 1, to which no shunt condenser is connected, the 885 will not oscillate. This point is used in certain applications where the linear sweep is not desired.

To test the signal amplifier and the vertical-deflection circuit, a high-resistance potentiometer may be placed (as a voltage divider) across the a-c line, and a small voltage (1 or 2 volts)

applied across terminals Nos. 13 and 11. A 0.1-uf blocking condenser should be inserted in each of these leads as a precaution against shorting the a-c line. Control No. 16 ( $S_2$ ) is turned to the position marked "D<sub>2</sub> Amp." and gain control No. 8 adjusted. A vertical deflection should be obtained, the amount depending upon the value of the input voltage and the setting of the gain control. To obtain a 1-to-1 pattern (the case where the sweep frequency and the signal frequency are the same), the sweep frequency must be adjusted to 60 cycles per second—providing this is the frequency of the a-c power line. This sweep frequency will be found with switch No. 12 at point No. 8 and with some particular setting of vernier control No. 9. The pattern may drift slowly across the screen unless it is locked by means of controls Nos. 6 and 7. Control No. 7 is thrown to "60 cycles" and No. 6 is turned forward until the pattern locks.

If No. 16 is thrown to "D<sub>2</sub>" and a voltage of 25 or 30 volts from the a-c source is applied to terminal No. 13 (No. 11 remaining connected as before), a similar pattern should be obtained; in this case, however, the signal amplifier is cut out. If the linear sweep is adjusted to 30 cps by means of No. 9, a 2-to-1 pattern (two complete cycles) should be obtained. The spread of the pattern can be adjusted with control

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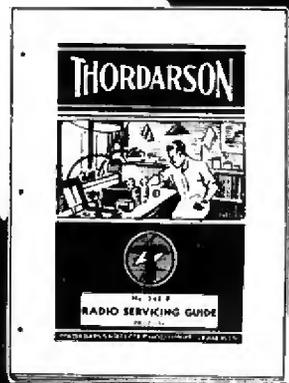
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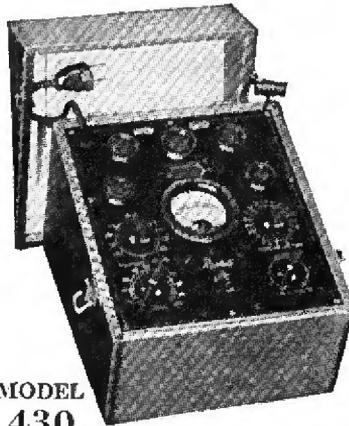
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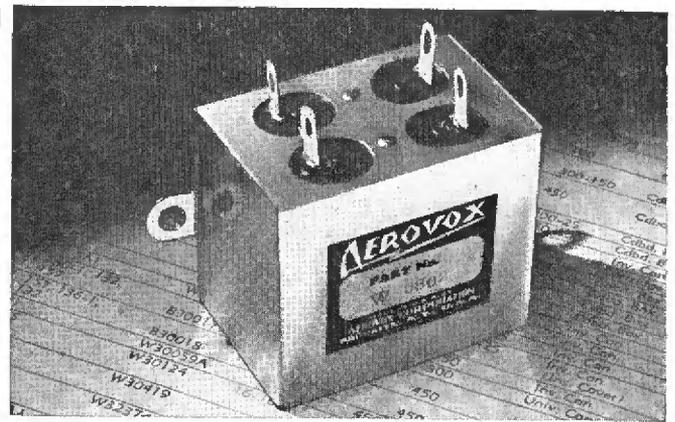
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No. 10. When it is desired to synchronize the pattern with an external voltage source, control No. 7 is thrown to "Ext. Sync." and the external voltage connected to terminal No. 2. Where an amplified external sweep voltage is desired, No. 5 is thrown to "E.S.A." and the external sweep voltage connected to terminal No. 3. If the external sweep voltage does not require amplification, it is connected to terminal No. 15, with switch No. 17 thrown to "D<sub>1</sub>."

### Alignment

The spot obtained on the viewing screen (with no a-c voltage applied to either vertical or horizontal deflecting plates) will not always be in the exact center of the screen. It may be somewhat off center, depending on the individual cathode-ray tube. However, it can readily be adjusted in the following manner: to move the spot slightly up or down, disconnect R<sub>15</sub> and insert a variable d-c voltage (obtained from a potentiometer across a 45-volt "B" battery) in series with R<sub>15</sub> and ground. The polarity and value of the d-c voltage necessary to shift the spot the desired amount can be determined in this manner, and should be recorded. This d-c voltage may then be applied permanently to R<sub>15</sub> from a tap on R<sub>21</sub> or R<sub>24</sub>, depending upon the

polarity necessary. A voltage tap on R<sub>21</sub> is negative with respect to ground; on R<sub>24</sub>, positive with respect to ground. If the spot is to be shifted to the right or left, resistor R<sub>16</sub> is disconnected from ground and the same procedure repeated.

In case the builder wishes to add permanent pattern-centering controls to the oscillograph (one feature omitted

meter from the +100-volt tap to the negative end of R<sub>21</sub>. Resistor R<sub>15</sub> is returned to the movable arm of the potentiometer, which then serves as a pattern centering control for the vertical deflecting plates D<sub>3</sub> and D<sub>4</sub>. Shunt another 0.5 megohm potentiometer across the first one and connect R<sub>16</sub> to its movable arm. This will provide a centering adjustment for horizontal deflecting plates D<sub>1</sub> and D<sub>2</sub>.

### Applications

A few of the more important applications for which the portable oscillograph is suited are: the study of wave shapes, measurement of modulation and peak voltages, adjustment of and location of faults in radio receivers and transmitters, and the comparison of frequencies. The 913 is capable of showing at least a 50-to-1 frequency spread, which would be helpful in the calibration of an a-f oscillator. That is, with a 200-cycle linear sweep, individual cycles of a 10000-cycle audio signal can be seen easily provided the sweep is spread somewhat beyond the edges of the viewing screen.

One of the more useful applications of the oscillograph in servicing radio receivers is that of the overall-audio-fidelity check. A simple Hartley r-f oscillator, designed to cover the frequency range of the receiver, can be constructed in a few minutes from a 27,

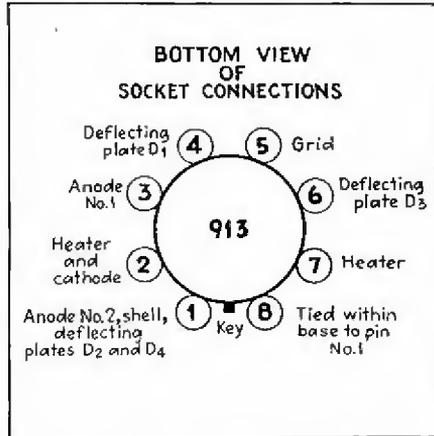
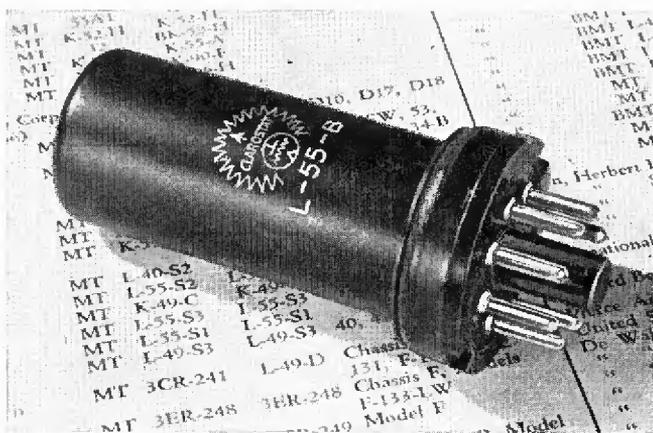


Fig. 5—Socket diagram for the 913.

from the present design), he can do so as follows: first, change resistor R<sub>24</sub> to two 25000-ohm resistors, so that a voltage tap of about +100 volts, with respect to ground, can be obtained. Then shunt a 0.5 megohm potenti-



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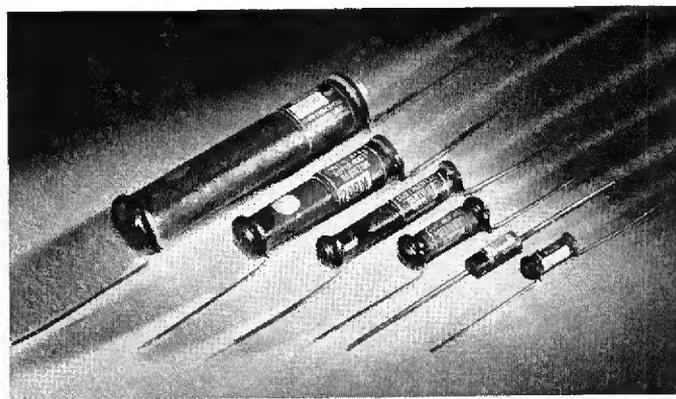
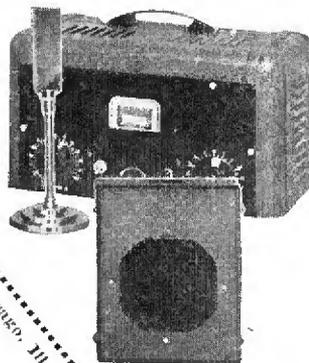
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The modulated-envelope pattern of the oscillator can be checked on the oscillograph merely by connecting terminals Nos. 14 and 11 (through 0.1-uf blocking condensers) to the plate and cathode terminals, respectively, of the oscillator tube. Control No. 16 must be thrown to "D<sub>3</sub>" and the linear sweep adjusted to 30 or 60 cycles per second. The pattern should look somewhat like that of Figure 5C. If the pattern is satisfactory, the oscillograph is disconnected from the oscillator.

The modulated oscillator is then tuned to the same frequency as the receiver, which will emit a 60-cycle rumble as resonance with the oscillator is approached. Oscillograph terminals No. 13 and No. 11 are next connected to the voice coil of the loudspeaker, switch No. 16 being turned to "D<sub>3</sub> Amp." and control No. 8 adjusted

for suitable pattern height. If the sweep frequency is adjusted to 60 cps, the resulting pattern should be that of a 60-cycle a-f wave having the same shape as the a-c line voltage which modulates the oscillator. Any serious distortion in any part of the receiver (except the speaker) will be shown by the oscillograph. An a-f pattern is obtained because the detector of the receiver rectifies the modulated r-f carrier and eliminates the r-f component. If serious distortion is present, the oscillograph pattern will be found of great assistance in locating the trouble.

A similar test can be made at any higher audio frequency, if desired. In this case, however, a sine-wave audio oscillator should be used to modulate the r-f oscillator.

#### Patterns

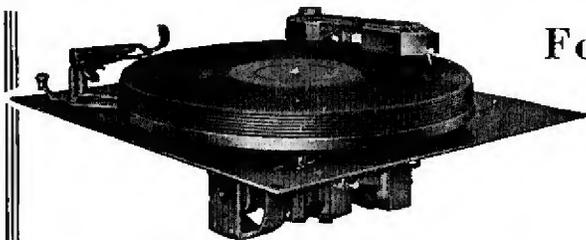
The portable oscillograph can be used for the visual alignment of r-f and i-f stages in a receiver, provided the usual auxiliary apparatus is available (frequency-modulated oscillator, synchronizing-impulse generator, etc.) The small size of the 913 screen is of little disadvantage in this application, due to the sharpness with which the spot can be focused.

The oscillograms shown in Figure 1 are from actual unretouched photographs of the 913 screen. Pattern 1A

shows a 420-cycle a-f voltage with a 60-cycle linear sweep. 1B shows a 3500-kc non-modulated r-f carrier. 1C illustrates the same carrier modulated about 50 or 60 per cent from a 420-cycle sine-wave a-c generator. In 1D, the carrier is modulated nearly 100 per cent, while in 1E it is considerably over-modulated. This condition is shown by the flattening of the negative halves of the modulation peaks, and is caused by the negative a-f peaks of the modulating voltage exceeding the d-c plate voltage applied to the oscillator. Figure 1F shows the carrier modulated 100 per cent at 420 cycles, with a 42-cycle linear sweep on the 913. Ten waves would be shown (420/42) but for the fact that the linear sweep voltage is spread beyond the edges of the viewing screen. The distortion of this pattern is an optical effect, due to the curvature of the camera lens and to the fact that the lens was slightly higher than the 913 screen.

The writer wishes to acknowledge his appreciation for the kind assistance of Mr. P. A. Richards,\* who helped in the design of the oscillograph and who photographed the screen patterns; and of Mr. G. Schnetzer, W21CA#, who assisted with the construction of the oscillograph.

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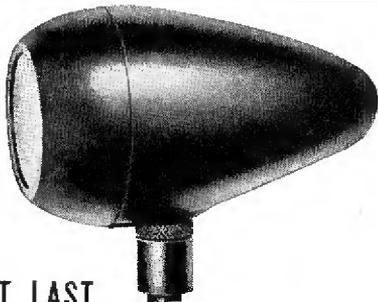
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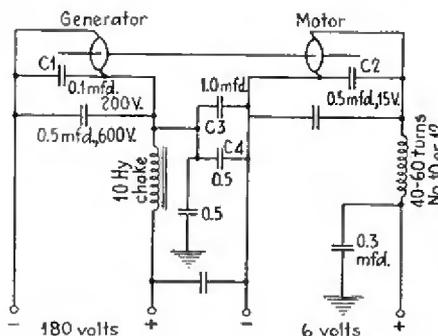
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ground the frame of the B power to the low A line and set chassis, but this should be unnecessary in most cases. If a large bypass condenser, .3mfd. or larger, is connected from the frame to the low A side, it will usually make an effective ground without having the motor chassis at D.C. potential.



countered in getting it inside the motor. It should be understood that these are paper bypass condensers, not electrolytic.

Condensers C3 and C4 cannot be substituted for a single unit of a large capacity, due to inductive effects. The circuit should be followed as closely as possible, and some experimenting should be expected with different machines.

In some cases it may be necessary to

### Repair Cement

By M. Knight

An excellent speaker cement can be made by dissolving scrap celluloid in acetone. The parts to be joined together should be given two thin coats and allowed to dry for a few minutes before applying a third coat and joining. It is easier to apply than most cements and makes a neater job.

### Parts Holder

By Marion L. Rhodes

When in need of something to hold small nuts and bolts when repairing a set, try a few of the glass coasters used under furniture legs. They are cheap and won't tip over when placed on the bench with other equipment.

**A. K. 37, 40**

Dead . . . replace 0.3 mfd speaker bypass condenser.

**BOSCH 46**

Bad hum at low frequency end of dial . . . this set must have a very good ground. Try different types for best results.

**COLUMBIA 5G-8**

Oscillation when volume control is advanced . . . insert a 5000 ohm resistor in the grid circuit of the detector.

**DE WALD 6I**

Distortion, hum . . . look for short between cathode of 4I and positive filament of 37 socket.

**EMERSON 5A**

Insensitive . . . replace 14,000 ohm cathode resistor on 85 tube. Resistor has greatly changed value.

**G. E. 105**

Off calibration . . . check afc. 6J7 and 5Z4 tubes before adjusting trimmer condensers.

**G. E. K-40A**

No volume . . . worn insulation on antenna lead where it passes through chassis.

**G.E. L-50**

Dead, low B voltage . . . open 8 mfd tubular voltage doubling condenser mounted under chassis.

**GRUNOW 5E**

Motorboating, intermittent . . . Replace part No. 28726, a .1 mfd 400 v. plate filtering condenser.

**LYRIC V-500**

Hum . . . line resistor under chassis leaking to ground through asbestos insulation. Insulate metal retainer from chassis with fiber washers.

**MAJESTIC 55**

Crackling, noisy . . . oscillator primary winding breaking down. Replace with new unit (I.F. 275KC).

**MAJESTIC**

Weak, crackling . . . check spray shield on all tubes to see if shield makes good contact with base pin. If poor connection is found, a small wire wound around tube where the base joins the glass will bond the base pin wire to the shield.

**PHILCO 30**

Intermittent . . . broken flexible wire under cover of grid control leads. Check from condenser to ground shows good contact but a check from inside of rubber control grid caps shows open.

**PHILCO 8I**

Fading . . . Usually caused by failure of one of the condensers in the a.c. line or in the center-tap of the power transformer. Opens are the most common failure. Usually attended by a hum or squeal, depending upon which condenser opens.

**RADIOLA 18**

Oscillation when new tubes are installed . . . locate neutralizing condenser under chassis and turn counter clockwise till oscillation ceases.

**PHILCO 116B**

Oscillation . . . push hot grid lead on volume control close to chassis.

**RCA RO23**

Weak . . . replace 8000 ohm resistor connected between screen and cathode of rf. and if.

**SILVERTONE 110**

Hum, weak . . . check 8 mfd wet electrolytic on top of chassis for low capacity and leakage.

**SILVERTONE 1584**

Weak, hum . . . connect a 10 mfd 35 v. condenser from cathode of 58 tube to ground.

**STEWART WARNER 1236-B**

Oscillation . . . replace 4 mfd filter condenser in can with audio bypass with higher voltage type.

**SPARTON 36**

Vibrator burns out . . . connect a .01 mfd 1600 volt condenser across secondary winding of power transformer.

**ZENITH 705**

Broad, insensitive . . . remove cathode resistor and bypass on 2A7 mixer. Ground cathode, then repeak I.F. and R.F. stages.

## Do You Want the HIGHEST Resistance Voltmeter?

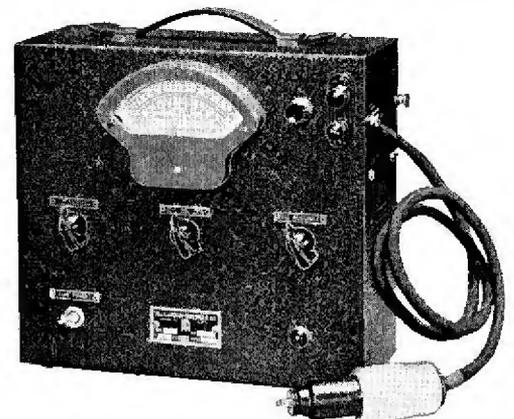
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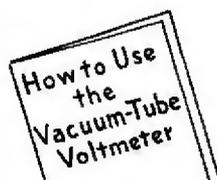
There is only ONE way to accurately measure voltage in high resistance circuits. Use the new MODEL 88 Combination Vacuum-Tube and Peak Potential Voltmeter. Three scales 0-1.2-10-100 volts, all draw absolute zero current from circuit under test. Over ten times the input resistance of other HIGH resistance voltmeters.

Send for FREE booklet just off the press, giving test procedure for over fifty important measurements such as: r-f and a-f stage gain, checking pre-selector and oscillator stages, matching coils, impedance measuring, amplifier gain, and response curves.

*Ask your jobber to demonstrate*



**FREE**



Send a copy of the new C-B Application Bulletin, "Use of the Vacuum-Tube Voltmeter in Receiver and Amplifier Servicing."

Name .....

Address .....

## The CLOUGH-BREngle CO.

2819 W. 19th Street

Chicago, U. S. A.

**PHILCO 76, 77**

Hiss on all stations . . . May be reduced by raising the value of the detector cathode resistor.

**PHILCO 95, 96, 112**

Blocking, similar to very slow recovery of AVC, set otherwise normal . . . replace volume control. Ringing sound in speaker when set is removed from cabinet . . . Same cause, volume control. Static similar to that caused by bad a. f. transformer . . . Check same control.

**PHILCO 112**

Poor tone . . . check 5 watt carbon resistor between speaker return and ground for drift from original value of 15 M. If necessary to replace use wire-wound unit.

**PHILCO 650**

Erratic volume control operation . . . Put a .00005 condenser between the tap of the control and ground.

**FORD-PHILCO 1934**

Distinct vibrator buzz that is hard to correct . . . Take out 75 second detector-a.v.c. tube. If noise stops suspect shaft collar holding volume control to case. Another check for this trouble is to find low settings of volume control more noisy than higher settings. Give collar another hard turn with a wrench to dig through paint and slight corrosion and also run a heavy, short piece of braid from low point of volume control to case and solder well. This will eliminate all buzz from this source.

**RCA 80-82-86**

Continual rasping of speaker . . . 600 kc. trimmer loose from chassis vibration.

**RCA 221**

Bad hum . . . leaky 4 mfd. cond. in capacity pack, No. 6703—C 22, disconnect blue lead and replace.

**RCA C6-12**

Low Volume . . . Check volume control for grounded center arm.

**RCA-VICTOR C11-1**

Set changes volume badly when speech-music control is varied . . . Install new capacitor pack. This pack is on the front of the chassis and connects to both volume and speech-music controls.

**RCA R-11**

Fading after few minutes operation . . . Replace '27 in A.V.C. socket with Sparton 485.

**RCA R11-GE 62**

Intermittent . . . replace C 18 a .1 mfd. condenser in A.V.C. network. This condenser located in capacity pack and can be distinguished by white lead that goes through resistor board.

**RCA-VICTOR R50, R55, RAE 59**

Distortion and lack of volume . . . Check primary of interstage transformer. The winding with the yellow lead opens up. Disconnect the yellow lead from the number 5 terminal on the 8-terminal strip of powerpack. Continuity test will probably show open or high resistance.

**WELLS GARDNER 5E**

Noisy . . . Replace the 50 mmf. condenser between plate of 34 I.F. and grid of second detector. This is a special wire wound capacity but can be replaced with a 100 mmf. mica.

**ZENITH 6D, 70**

Weak signals accompanied by strong A.C. hum . . . half of filter condenser across speaker field shorted: replace.

**ZENITH 6M-90, 6M-91, 7M-91**

Dead, intermittent or noisy when jarred . . . Look for broken connection from bottom of condenser gang to oscillator or first detector coil.

**ZENITH 4B131**

Oscillator dead . . . Remove oscillator coil, place eighth inch composition spacing washers over mounting lugs and reassemble.

**ZENITH 1937 MODELS**

Strong motor-boating with switch in distance position . . . replace screen grid and plate bypass condensers marked C 4 in schematic.

---

## PLANS FOR 1937 PRODUCTION

(Continued from Page 11)

(Paul Bryant)

quotas broken down in the same manner by cities and rural towns.

Each distributor is also provided with information, figures and necessary forms to enable him to keep an accurate weekly record of sales and quotas in these cities and towns in each salesman's territory. These records provide each distributor with a complete detailed yardstick of weekly performance throughout his territory and a means of measuring the performance of each city, each salesman and each dealer. This information enables a distributor to put his finger immediately on any weak spot in his territory or on the work of any one salesman.

The information outlined in the foregoing paragraph is available to our district managers, whose first duty, when calling on distributors is to check these records and to work with the distributor in correcting any weakness that may exist in any locality or city or on the part of distributors' salesmen. Our district managers are routed to the distributors in their territory who are currently doing the poorest job. This is accomplished through the information on file in our office. Upon arriving at the distributors' headquarters, our district manager immediately checks the distributor's records of performance and devotes whatever time he may have to spend with that distributor in the cities or with the salesmen where the sales performance is below par.

(Continued from Page 12)

(Don Park)

to a survey made among the largest manufacturers in the country.

A very constructive plan of special rewards can be set up, giving the distributor certain cash prizes each month for every county which is over its quota for the month, and a certain additional reward in the form of honor pins, etc., for the distributor salesmen who have every county over quota for a period of three, six, nine and twelve months.

### *Regular "Pulse-Feeling" Essential*

In our own organization in order to prevent overstock and so regulate production, each distributor reports to us each Monday morning his inventory as of the preceding Saturday, plus his sales for the past week. These reports must be in our office Monday morning without fail, using air mail or telegraph if necessary.

We also maintain a separate quota for orders from distributors. This quota naturally must be broken down on a different monthly basis than the quota for sales, for the distributor orders in advance of retail sales to dealers. The percentages used in the monthly breakdown are determined by a statistical procedure known as "The Link Relative Method." This procedure tends to iron out the cyclic variations and gives us a true seasonable variation.

The radio industry has not yet been established long enough to exactly figure all cyclic variations.

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 Radio Retailing

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## 1937 TUBES

Every Confidence and  
 Unameter  
 TUBE TESTER

can be brought up to date for 1937 octal base and metal tubes by either adapters, Kits, Socket Units or factory re-vamp jobs at very reasonable rates. From \$2.00 up. You cannot obtain proper test data for the new tubes from any source other than this factory. Send for FREE SETTING FOLDER No. 152 which describes fully the requirements to bring every model up to date. Tell your friends who own one of the thousands of Confidence or Unameter testers.

**APPARATUS DESIGN CO.**  
 Little Rock, Arkansas

Owned and operated by J. R. Williams & Sons

## PHILCO Parts, Service Manuals, Tubes, etc.

Catalog Sent on Request  
**WILLIAMS PHILCO, INC.**  
 806 S. Adams St., Peoria, Ill.

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**RADIO RETAILING**

330 West 42d St., New York City

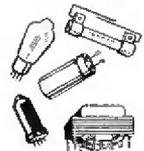
## 38 Amazing RADIOS



1937 Knight Radios offer you unbeatable profit-making opportunities! Sensational new features include giant 11-in. Magna-Span Dials and super-dynamic Vita-Tone Speakers. Unmatched performance, at amazingly low prices. 38 models, 5-19 tubes, as low as \$8.45!

## 10,000 Service Parts

You can fill every service need from the ALLIED Catalog—at lowest prices. Lists over 10,000 exact duplicate and replacement parts, complete test equipment, tools, books, etc. You save time, trouble and money on every purchase by ordering from ALLIED.



## Send For CATALOG

FREE!



This great 152-page Catalog also shows newest sound systems, amateur gear, kits, Hi-Fi power units and Windchargers, etc. Whatever you need, you'll always find it in the ALLIED Catalog at the lowest prices.

## ALLIED RADIO

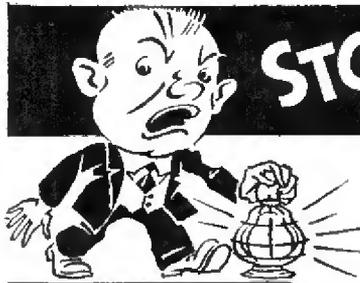
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 833 W. Jackson Blvd., Chicago, Ill.

Send us your new 1937 Catalog (Free).

Name .....

Address .....

City .....



# STOP SEARCHING!

HERE IS YOUR "GUIDE"

Don't Grope Around In The Dark...  
 Send For This New Radio Buying Guide Today!

Here is the solution to all your radio supply problems... Here is your key to the fastest service... Lowest Prices... and the largest stock of Radio Repair Parts in the world! This Radolek new 1937 Radio "Profit Guide" is the most complete Radio Parts Catalog ever published... over 160 pages... bringing to you over 10,000 individual Repair Parts... hundreds of new items... a complete new selection of Radio Receivers, Amplifiers, Tubes, Tools, Books and Instruments... Everything you need... always in stock... ready for prompt shipment... at the right prices.

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It's FREE! Send this coupon NOW! Radolek endeavors to restrict circulation of the Profit Guide to those actively engaged in the Radio business. Please enclose your business card or letterhead.



**FASTEST SERVICE**

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## RADOLEK

601 W. Randolph St., Dept. A-3, CHICAGO

Name .....

Address .....

Serviceman?  Dealer?  Experimenter?

# LETTERS

## Comm. Receiver Discounts

In the November issue of *Radio Retailing*, pages 34 and 35, you have a very interesting display of communication receivers. In the article you suggest that the radio dealer is missing a bet if he does not stock at least one of these sets.

We have been in the radio business ever since broadcasting started and the writer has often looked longingly at this possibility. Being a "ham" myself, I realize the superior performance of these sets. BUT, these sets are sold by radio supply houses at 40 per cent off the advertised list, to anyone who wishes to buy.

If any of the manufacturers on page 35 will sell to the radio dealer so he can make a profit we would very much like to hear from them.

WHITTIER, CALIF. R. G. PEELE  
Makers of communication receivers, please copy.  
EDITOR

## Will His Face Be Red?

There seems to be quite a difference of opinion as to whether or not a charge should be made for tube testing.

For my part, I encourage the public to bring their tubes in for testing. No charge. Where I have to go out I make a flat charge of fifty cents, which is little enough. In the days when tubes brought a better price I made no charge at all.

The sort of thing that burns me up is the party that comes in, takes my time and the use of my high-priced tube tester without any intention of buying.

A short time ago a boy of apparently about fifteen and smelling very strong of the cow barn came in with some tubes to be tested. I found one bad one and tried to sell him a new one, telling him the price was one dollar. "Oh well", he said, "I can buy them mail-order for fifty-seven cents."

I have this boy's picture and fingerprints filed away in my "Rogues Gallery" and when he comes in again he will be advised to send his tubes to the mail-order house for testing.

ARTHUR RISLEY  
RICHFIELD SPRINGS, N. Y.

## Spartan Medicine

I've seen a lot about the difficulty thrown in the way of radio dealers by retail mail-order houses. And I must confess that it certainly cannot be taken lightly. I have put in a lot of time convincing a prospect that the nationally advertised lines of radios suit his needs only to have him "yes me" and go home and order from a mail-order house.

Once, I started selling unknown brand radios. Most of them performed so poorly that they were hard to sell and prevented

me making other sales in the same locality.

But there is a way to handle mail-order competition and at the same time take a whack at companies that make these private brand receivers for them at one price and sell the same things with trade-names to jobbers at another. The solution is about as tough as the competition but it does work.

How about building your own receivers? A lot of my sales are home constructed sets

## GOING UP



Amos and Andy (NBC) give us a mail mark to shoot at

put together at surprisingly low cost and they work better than most cheap factory-made jobs. One drawback is troublesome. Obtaining cabinets. Much time could be saved if cabinets could be obtained uncut. If some cabinet maker would come out with a line of competitively priced table model cabinets this would be a great help.

OLA, ARKANSAS GERALD EVANS

## Barnum Was Right

Something should be done about all these fake gadgets people are told will cure radio noise if simply hung on their antenna. The market is being flooded with this stuff.

To prove to ourselves that people fall for such junk our serviceman made up a supply of gadgets as follows: A straight piece of wire in a sealed can, two binding posts connecting the two ends, a piece of lead sealed in to add weight. We gave some of these to our customers free and asked them to try the gadgets out. A questionnaire asked: (1) Did it improve reception, selectivity and distance? (2) Would you pay 25c for this?

Out of 15 people 9 said yes on the first question, 4 said they were not sure but thought there was some improvement and 2 said there was no improvement. To the second question 11 said yes and 4 said no,

Eight, believe it or not, asked us to order one for them!

DUBUQUE, IOWA FRED C. EVEN

## Flowers, For Charts

Very much pleased with Actual Socket Voltages and I, for one, wish you to keep up the good work. I rate *Radio Retailing* "Tops."

TOLEDO W. R. BROWN

We find the various "plates" in your magazine on socket voltages and socket connections very helpful. They are even better than those sent out by the tube manufacturers.

Would it be possible to secure tear-sheets of these pages? We do not like to cut up the magazine to file them for reference.

ASHLAND, ORE. GLEN A. PRECOTT

Sure, we'll supply an occasional free tear-sheet or two, if we have any left. But we can't guarantee to shoot them out in quantities.  
EDITOR

I have been a subscriber to *Radio Retailing* since it first came out and I want to know if you will allow me to use the page in your last issue that shows the serviceman, and what it takes to prepare him to give good service. I would like to have your permission to reprint this in one of the local papers to advertise my service work.

ATLANTA HENRY L. REID  
Permission to reprint: Granted. EDITOR

## Flowers, Assorted

Although my subscription has expired under the Balsam Electric Shop don't think I am without RR for \$1 for 12 months!

Ridiculous! I would not be without it if it was one dollar per copy!

I now receive RR under the name Junction Radio, 3705 Junction Blvd., Corona.

FLUSHING, N. Y. S. S. BALSAM

I received your latest copy of *Radio Retailing* and I am very much impressed with the information you have in store for the radio dealer and serviceman.

I have told my radio friends about your wonderful book and I expect them to get in touch with your office about subscribing.

NANTICOKE, PENNA. JAMES O'DONNELL

Your records show that I have been on your list for a number of years and the big item is the "Tricks of the Trade" section. This section alone is well worth the price of the entire magazine.

PITTSBURGH E. D. MOORHOUSE

# THE ONLY AUTO RADIO WITH AFC



For the first time in radio history, you can sell auto radio with *AUTOMATIC FREQUENCY CONTROL*. It's a sales-clinching feature. Your prospects will appreciate its safe-driving advantage — eyes concentrated on the road — while AFC permits instantaneous tuning for perfect Focused Tone reception. This new, sensational G-E Auto Radio offers the most *dramatic, demonstrable, sales-getting* combination of sales features ever incorporated in auto radio. Three proven profit leaders complete the G-E Auto Radio line.

Ask your G-E Radio Distributor how you can shift your sales and profits into "high" with a G-E Auto Radio **MERCHANDISING PACKAGE**.

DELIVERIES COMMENCE FEBRUARY

### MODEL FA-60

6 G-E Metal Tubes, plus synchronous-type vibrator (8-tube performance).  
6½-inch Speaker.  
Antenna Circuit-matching System.  
4 Watts Output.

### MODEL FA-80

AFC Control.  
8 G-E Metal Tubes, plus synchronous-type vibrator (12 tube performance).  
6½-inch Speaker.  
Compensating AVC.  
Antenna Circuit-matching System.  
3-point Tone Control.  
7 Watts Output.  
Class "B" Amplification.

### MODEL FA-61

6 G-E Metal Tubes, plus synchronous-type vibrator (8-tube performance).  
6½-inch Speaker.  
Antenna Circuit-matching System.  
Tone Control.  
4 Watts Output.

## GENERAL ELECTRIC

### AUTO RADIO

*A Brilliant New Star* IN THE CROSLLEY LINE  
 A CROSLLEY 5-TUBE SUPERHETERODYNE  
 PORTABLE AC · DC RECEIVER

**A NEW HIGH IN VALUE . . . A NEW LOW IN PRICE**

*The Sales Leader That Dealers  
 Everywhere Have Been Awaiting!*

Hitch your "sales chariot" to this new star in the Crosley Radio line—the Crosley Model C-516, 5-tube AC-DC Superheterodyne—for it's headed for the heights in 1937. Never before has such a remarkable set been offered at such an astoundingly low price . . . never before have so many outstanding features been found in any radio near this price range. Have your Crosley Distributor show you the Model C-516 . . . check its long list of selling features . . . hear its marvelous performance . . . and ask for details of the Crosley Franchise that will put this sales leader to work for you.

**CROSLLEY MODEL C-516**

**\$16<sup>95</sup>**

Five tubes (2 dual purpose) Superheterodyne Circuit . . .  
 Full Vision, Illuminated Airplane Type Dial, calibrated  
 in both kilocycles and meters . . . Tuning Range 540-1725  
 kc. . . Standard and Police Broadcasts . . . 5" Full  
 Tone Dynamic Speaker . . . Operates on 110-volt AC or  
 DC . . . No Ground Required . . . Solid Mahogany Cabi-  
 net . . . Litz-wound antenna coils and other exclusive  
 features. Dimensions: 7<sup>1</sup>/<sub>2</sub>" high, 10<sup>1</sup>/<sub>2</sub>" wide, 5<sup>1</sup>/<sub>2</sub>" deep.



*(Prices slightly higher in Florida, Rocky Mountain States and west.)*

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