

JANUARY, 1933

RADIO

INCLUDING
SERVICE
AND
INSTALLATION
SECTION

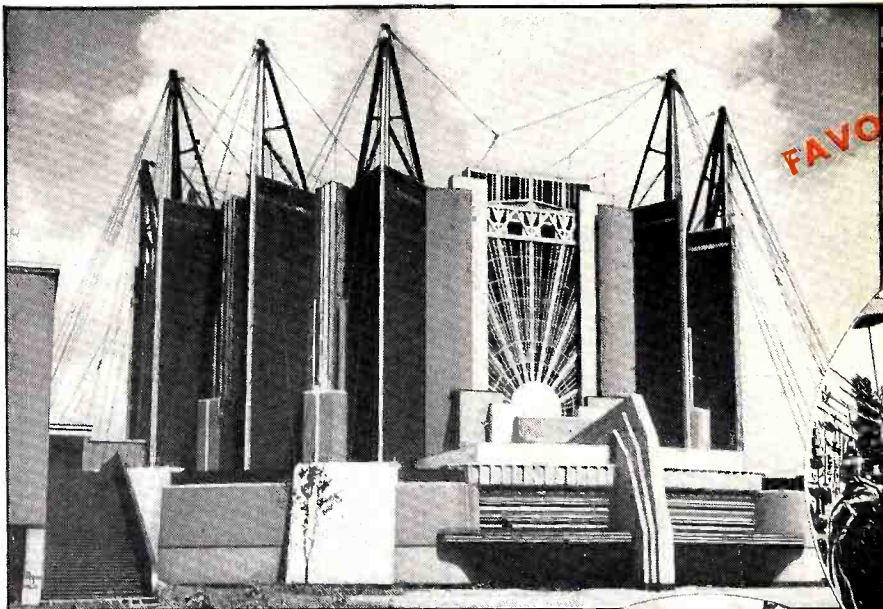
RETAILING

HOME ENTERTAINMENT MERCHANDISING



“Roll Your Own”

Automobile-Radio! 1933's opportunity! And it's your market, Mr. Radio Dealer. But, to sell it, YOUR OWN CAR MUST HAVE A SET. “Roll Your Own.” Apply this slogan to auto-radio. Twenty thousand radio-equipped dealer automobiles . . . 20,000 auto-radio stores on wheels . . . double exposure selling. This should be our objective for 1933 . . . So—“ROLL YOUR OWN!”



FAVORED IN CHICAGO

© GALLOWAY



WELL KNOWN IN BANGKOK



WIDELY USED IN BOMBAY

ARCTURUS

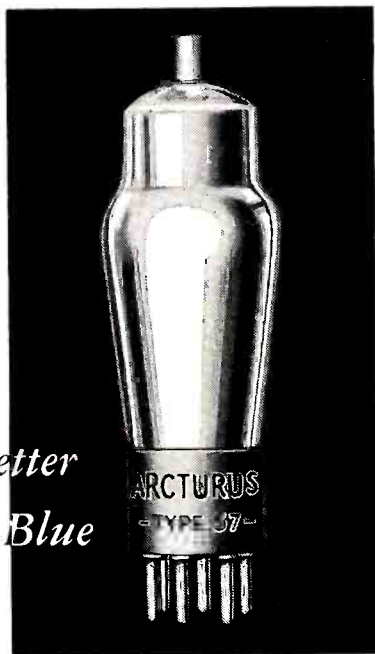
BLUE Tubes are

"speaking" 78 languages today

THROUGHOUT the world, in Bangkok, Bagdad, Bombay—wherever radio is used—Blue Tubes are used. Used in more countries than any other tube on the market.

Blue Tubes are "speaking" 78 languages today. No other tube has this world-wide recognition. The reason—dealers everywhere have found Blue Tubes dependable. They make any set work better. That's why they are standard equipment with more set manufacturers than any other tube, assuring a huge replacement market. And that's why dealers everywhere are switching to Arcturus—the fastest-selling tube today.

ARCTURUS RADIO TUBE CO., NEWARK, N. J.



*ANY Set is Better
with Arcturus Blue*

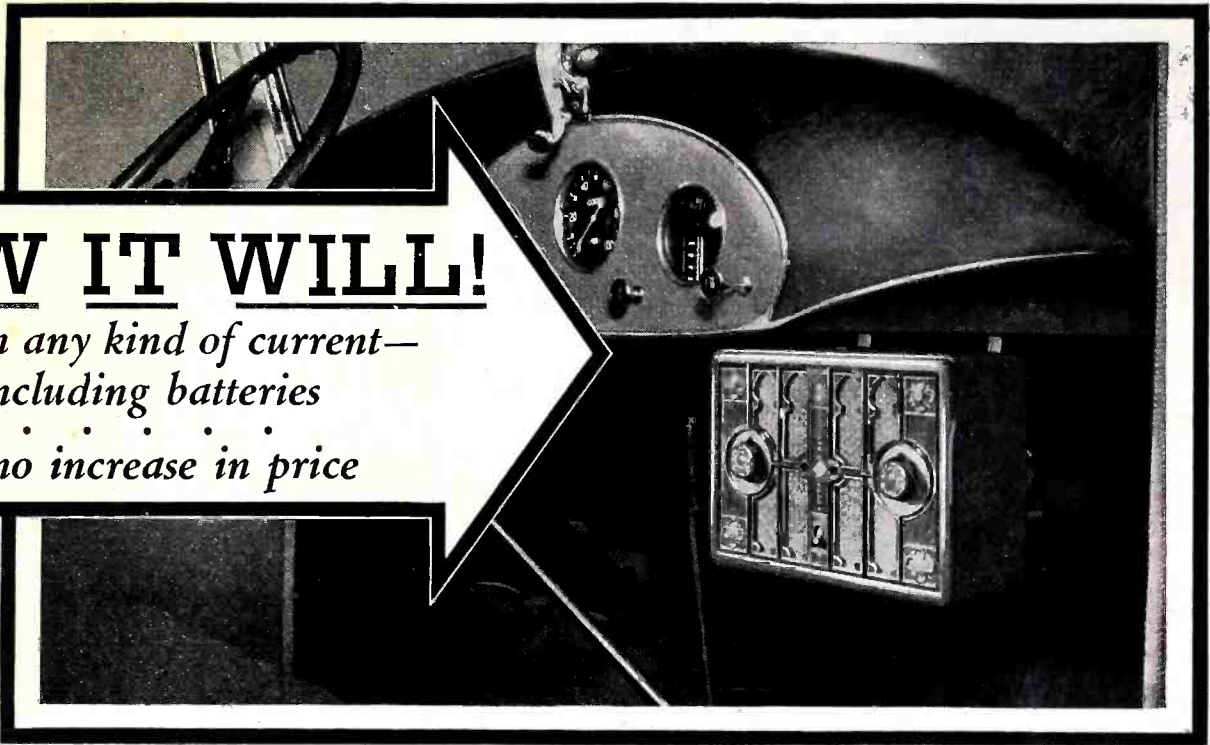
"The BLUE TUBE with the LIFE-LIKE TONE"

THEY ALL SAID:

"If it would only work on a car"

NOW IT WILL!

*and on any kind of current—
including batteries
at no increase in price*



Here's the biggest piece of radio news ever released! The new Kadette now operates on any known lighting current—6 and 32 volt as well as 110 or 220 volt—A. C. or D. C.—Any cycle

Now the Kadette operates in any car! On the farm from batteries or lighting plant; on boats, aeroplanes, in camp, as well as the city home, office, hotel, in Europe. *The most useful radio ever built.*

Think of it! Visualize the tremendous new market for the Kadette. Here's a radio you can use in your car—Detach the plug and it is ready to serve you in the office on D. C.—Take it home and it performs perfectly on A. C.—Travel with it to the country and enjoy the same performance on farm power or batteries.

15 Minute Car Installation

Any car can be equipped with the new Kadette in fifteen minutes. No holes to drill—just a simple easy operation any one can do. The Kadette is the most economical radio on storage batteries—uses less than one ampere.

The Kadette Auto Kit

For the convenience of Kadette owners desiring car operation there is the Kadette Auto Kit containing necessary cables, plugs, rubberized mounting brackets, spark plug suppressor kit and a complete illustrated book of instructions and installation suggestions.

Larger Profits—Less Investment

This astounding announcement to the trade will be quickly followed by a
©International Radio Corp. 1932.

similar message to the public. Thousands will be clamoring for the new Kadette—the first radio operating anywhere radio is wanted—*all for one price.* This is vitally important to every radio dealer. It enables him to serve all customers with one radio—multiplying turnover and profits—at less inventory investment.

Write or Wire For Full Details

Be ready. Get your full share of the big demand that will sweep the country for this sensational radio. Don't delay a single day. Write or wire *now* for the name of the distributor in your locality.



The good looking Kadette, cased in genuine bakelite, appropriately harmonizes with home or office furnishings. Weighs only 5 pounds. Carries like a camera.

**Present Kadette Dealers—
Important Information**

The new Kadette can be identified by the serial number. All sets numbered over 75,000 contain this new ambielectric feature. Check your stock—order Kadette Auto Kits. Be prepared for big business.

LIST PRICE \$25 Kadette
Including Tubes Auto Kit extra

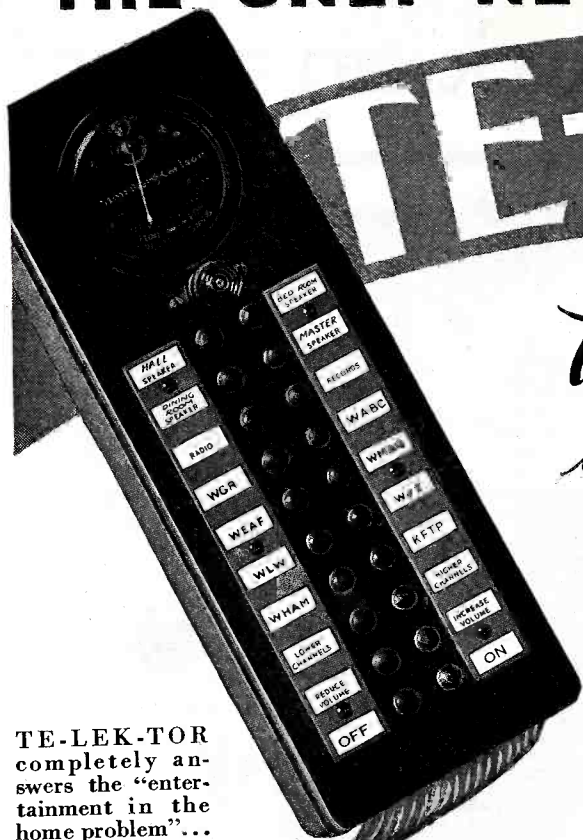
Originated and manufactured by
International Radio Corporation
Ann Arbor, Michigan

THE INTERNATIONAL
KADETTE
Radio



Licensed under patents of Hazeltine, R. C. A. and Associates.

THE ONLY NEW THING IN RADIO



*With a Lure
that lifts the prospect
to a "PROFIT" plane*

TE-LEK-TOR completely answers the "entertainment in the home problem"... because TE-LEK-TOR serves every room and every nook in the home, and TE-LEK-TOR—

*Brings your favorite radio program to any room, or all rooms, at the touch of your finger
Plays recorded music the same way*

Gives reality and brilliance almost unbelievable... particularly to those accustomed to standard radio or phonograph performance

In the old days of the phonograph the sale of records provided the profitable "repeat" feature.

Now in radio there is something with a "repeat" feature—the new Stromberg-Carlson TE-LEK-TOR. You start a customer with a TE-LEK-TOR receiver which alone is a profitable sized item. Soon this customer wants to add more and more items to his TE-LEK-TOR system—to extend it gradually from room to room. This is "repeat" business—a business which may easily build up to several times the original sale.

Let us tell you the experiences (from a profit standpoint) of some dealers who have sold TE-LEK-TOR during the last few months.

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



1894

Stromberg-Carlson

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



1933

Things Happen when you demonstrate the Step-Saving **LEN-A-DOR** and other Leonard Features

INTEREST! ACTION! EASIER SALES!

Leonard is the one electric refrigerator you can demonstrate *dramatically*—with action and sustained interest! No other refrigerator provides the salesman with so many opportunities to *do* something, as well as *say* something, or so many features the prospect can try for herself.

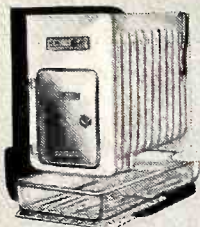
There is *action* when you touch a toe to the **LEN-A-DOR** pedal. The wide door swings gently open; prospects at once see the value of this exclusive feature. So it is with the new Leonard sliding shelf, sliding dairy basket, telescoping shelf, vegetable bin. Leonard's long list of advanced convenience features are *extra* values in a line distinguished for beauty, quality, durability—10 beautiful new models (4 all-porcelain)—4 cu. ft. to 9½ cu. ft. food capacity. Write or wire for details of this profitable franchise.

LEONARD REFRIGERATOR COMPANY
14259 Plymouth Road, Detroit

(523)



THE LEN-A-DOR



ALL-PORCELAIN COOLING UNIT



CHILL-OM-ETER



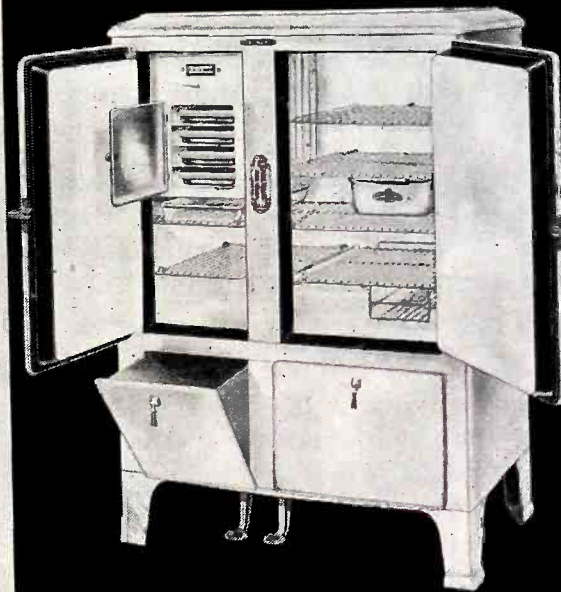
SANITRAYS



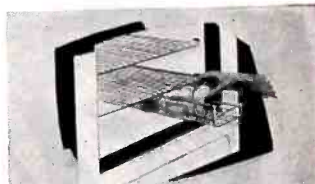
RUBBER TRAY



AUTOMATIC ELECTRIC LIGHT



MODEL L-752—7 1/2 CU. FT.



DAIRY BASKET



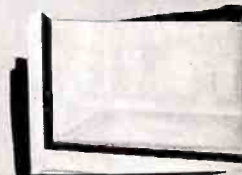
SLIDING SHELF



TELESCOPING SHELF



VEGETABLE CRISPER



ONE-PIECE PORCELAIN INTERIOR



VEGETABLE BIN



The new

LEONARD

ELECTRIC REFRIGERATOR

Please send me details regarding the Leonard line and the Leonard franchise.

Name _____

Address _____

City _____ State _____

14259

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

A NEW

It's NEWS in Electric Refrigeration

NEW Lines And now, THE CRUSADER—a brand-new line of popular price refrigerators to meet the mass demand. And there's more news—it's a *complete* line, not just two or three models, but *five* sizes. Now you can more than meet competition.

NEW Prices The new line supplements the regular Servel Hermetic line. The low priced CRUSADER as a leader—and the quality line SERVEL HERMETIC for quality buyers.

NEW Discounts At last a discount that gives qualified dealers the margin needed to show a profit. It's real news.

NEW Advertising Set-up Local advertising to help you sell—advertising over *your* name—*plus* thou-

SERVEL

DEAL!

sands of messages delivered by special messenger to prospects *you* select. How's that for news—but there's more, too!

NEW Field of Prospects With the same operation Servel opens up *eight* new markets for you. Better ask us what they are—they're profitable.

NEW Factory Help Servel has a new plan of direct help from the factory—help in selling—help in promotion—help in making a profit. How? We'll give you the whole story

IT'S REAL NEWS! Ask us all about it. Write to Servel Sales, Inc., Evansville, Indiana.

COMPLETE LINE OF REFRIGERATION

HOME STORES RESTAURANTS WATER COOLERS
ICE CREAM CABINETS MILK COOLERS AIR CONDITIONING

The ONLY Exclusive Feature in Radio AUTOMATIC TUNING

Attracts Customers to Your Store
AND SELLS THEM ★ ★ ★



\$145

gives your customers this fine Model 420 Zenith with Automatic Tuning and every one of Zenith's 1933 All-Star improvements, complete with Zenith-quality tubes, tax paid.

STAR POINTS IN THE NEW ZENITH

★ New 7-Prong Power Tubes ★ Automatic Tuning ★ Shadowgraph Tuning ★ Visual Treble Tone Adjuster ★ Visual Volume Control ★ Catenary Tone-Volume Equalizer ★ Twin Dynamic Speakers ★ Auto Dash Type Escutcheon ★ Longer Wave Band—Police Calls and new Canadian Station ★ Full Circle 8-Inch Logging Dial ★ Automatic Between Station Noise Suppressor ★ Advanced Superheterodyne Circuit ★ Dominant beauty in cabinets.



ARE YOU getting full demonstration and sales value out of Zenith's Automatic Tuning? Hundreds of dealers are. You can.

This simple device eliminates all tuning fuss and bother. No logs to consult. No stations to remember. No more dial twisting. Just press a button, and there's your station.

It is the only *exclusive* feature in radio . . . and it helps Zenith dealers' sales as only an exclusive feature can.

Easily demonstrated! A window display of Zenith Automatic Tuning, with an invitation to come in and see it operate, brings prospects into the store. After they get in, Automatic Tuning is easily demonstrated by any floor salesman, before the eyes of the customer.

Clears the ground for a sale! Seeing this fascinating device in

operation arouses desire of ownership in nine out of ten prospects, and goes far toward turning the prospect into a customer.

Demonstrate the other outstanding features of the new 1933 Zenith line . . . new 7-prong power tubes, auto type escutcheon with shadowgraph tuning and all controls visual, twin dynamic speakers, finer tone quality at lowest volume or high, longer wave band for police calls . . . and you've usually gained a sale.

Because it gives dealers a profit on sales, as well as stimulates sales, the new 1933 Zenith line is the success of the season.

If you're already handling the Zenith, get full value out of the advantage that Automatic Tuning gives you. If you're not selling Zenith, get in touch with the Zenith distributor immediately.

ZENITH
RADIO

14 NEW MODELS . . . \$44.95 to \$184 (complete)

A CHALLENGE—We challenge anyone to name a single demonstrable improvement in radio not found in the new 1933 Zenith line. Further, we challenge anyone to name another radio line which has all the improvements found in the new 1933 Zenith line.

RADIO RETAILING

HOME ENTERTAINMENT MERCHANDISING

O. H. CALDWELL, *Editor*

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P. WOOTON, *Washington*

HISTORY—*and* 1933

ANOTHER year has been added to Radio's vivid history. In retrospect the following were its *significant* developments. Significant not only because they constitute its most important happenings but because of their influence on the future course of our industry.

Of first importance, in our editorial opinion, was the immediate acceptance of the "personal" or SUB-MIDGET RECEIVER. Its popularity, culminating in December's dominating demand, cannot be ignored. Because of its compactness and unique appearance this model has created many new markets. Low price was not the compelling factor; the public has been offered better—and bigger—values in the past. No, John Consumer bought the cigar box set for exactly what it is—a special purpose model, admittedly of limited range and ordinary tonal quality. This set will remain with us. Wisely merchandised, it will continue to be sold for uses where the console obviously is unsuited.

The historic GOVERNMENT SUIT AGAINST THE RADIO CORPORATION OF AMERICA was settled last year. This "consent decree" may or may not affect profoundly the future prosperity of radio. If RCA will take constructive advantage of the strategic position it legally now enjoys it can exercise cooperative leadership towards the stabilization of manufacturing and merchandising practices which the situation so urgently needs.

AUTOMOBILE-RADIO has come into its own. 1932 witnessed the introduction and practical performance of B-eliminators. The public has accepted auto-radio. It wants it—to the tune of 250,000 installations during 1933, unless all signs fail.

Decreased set business caused a number of dealers to specialize in SERVICE last year. Also

many independent service shops were established. As the year-by-year accumulation of listeners continues the importance of the service specialist will become more apparent.

Elimination of man-made interference came in for serious study during the past ten months. NOISE-REDUCING AERIALS have "caught on." Engineers are meeting to exchange ideas concerning the future development of this aid to listening satisfaction.

The radio industry familiarized itself last year with the advantages and disadvantages of handling MAJOR ELECTRICAL APPLIANCES. In many instances the electric refrigerator and the electric washing machine contributed materially to keeping the radio dealer in business—at a profit. He will continue to favor these products. And he will perfect his sales technique during 1933.

A 7,000,000 HOME REPLACEMENT MARKET. The article which follows this editorial tells the story of our growing replacement market for sets. *Radio Retailing* finds that at least 7,000,000 receivers now in use are obsolete and should be replaced. This is one of the outstanding merchandising opportunities for the aggressive type of radio dealer which 1933 will develop.

Lastly, the TUBE SITUATION. Prices are at a low level. Under the momentum generated in '32, new types of tubes continue to be announced with disquieting frequency. Must dealers' shelves be enlarged to accommodate these "57 varieties" and more? The answer is still a matter of speculation. However, the Tube and Set Engineering Committees of the RMA, working in close unison, are making every effort to "see that only such new tubes are authorized and produced which are a marked improvement in the art."

7,000 Set Owners

How old is your radio
Is it a midget or console
Does it use batteries
How many tubes has it



WHAT ARE THE FACTS about the size of our replacement market for receivers? What, for example, are the chances of selling the present radio owner a new set?

Forty-two out of every 100 sets in use are over three years old, according to figures recently collected for *Radio Retailing*. During the past five months trained radio engineers have been interviewing radio users, right in their own homes. Seven thousand and thirty-nine carefully compiled reports were turned in as the result of this professional survey. They reflect accurately conditions in 79 towns and cities throughout the United

States, from Nashua, New Hampshire to Amarillo, Texas, from the Atlantic to the Pacific. Cooperating with the Institute of Radio Engineers, who employed these observers, *Radio Retailing* has obtained the following, specially prepared information concerning the status of the replacement market: Less than 16 per cent of all the sets in use were purchased within the past year; 39.1 per cent are two years old or less, and 58 per cent have been in use under three years. Stated from the dealer angle, 42 per cent of the 7,039 sets in use, checked by these IRE investigators, were found to be over three years old. If this ratio be projected nation-

were INTERVIEWED

AN UNLIMITED REPLACEMENT MARKET

awaits the dealer who will

Get Out and SELL during 1933

extensive survey reveals

By Ray V. Sutcliffe

ally, based on approximately 17,500,000 sets in American homes today, we find that there are in use 7,350,000 receivers which have none of the recent very valuable improvements. These sets may quite properly be rated as obsolete by the progressive dealer out for business.

Who shall claim that our market is a diminishing one—in the face of this opportunity? *No, the problem for '33 is not one of finding prospects but of selling them.* Without question of doubt there are hundreds of listeners within walking distance of any radio dealer who need a new set—and who could be persuaded to buy one if properly contacted. The situation today, then, calls for intensive and intelligent salesmanship.

Selling a 1933 Model to a 1929 Set Owner

A majority of these owners of sets of ancient vintage were fairly well pleased with their investment—because they did not realize how much they were missing. They hadn't had a *comparative* demonstration, in their own home, of 1933 quality. But this doesn't mean that they're not prime prospects for a new set, or couldn't be interested in a demonstration. Quite the contrary was found to be the case. Time and time again, during these interviews between the 7,000 set owners and our IRE investigators, questions concerning the advisability of buying a newer model or the advantages of "one of the latest sets," were voluntarily asked by the former. They were satisfied, in other words, but willing to be shown.

This type of prospect—7,000,000 of them—can be sold the better type of console. The price appeal is losing its pulling power. The man or the woman who needs to replace an old set with an up-

to-date product can be interested in *performance*. Sell them, therefore, on the idea that a radio set is a musical instrument—and who would buy a tinny piano or a cigar box violin, if the real thing could be had for only \$5 more a month?

But, in these days, even a \$60 difference in price must be convincingly justified. To our readers who keep their back copies of *Radio Retailing* we suggest that they read again the article in the September, 1932, issue: "I Demonstrate the Difference." This article stresses the value of hooking up the old and the new set with a double throw switch, for quick comparison purposes. Then it explains how to play up automatic volume control plus automatic muting—the "free wheeling" feature of the new sets. Call the prospect's attention to the noise between stations and the "blasting" by locals that is observable in his own set as against the absence of these annoying disturbances in your 1933 receivers. Let the prospect tune the new set himself.

Then swing to tone quality. Show where the old set fails to correctly reproduce either the high or the low notes, or both. And don't forget the short wave feature.

We cannot emphasize too strongly the absolute necessity, like it or not, of getting out and calling on users this coming year. "I've got an old set and I think I could be sold a new one—but never, to my knowledge, has a radio dealer called at my home and told me about the new models." I wish I had a dime for every time I've heard this complaint. We think we're doing a selling job . . . but are we?

In the preceding paragraphs we have merely touched upon the practical aspects of the selling job for 1933. We cannot supply the shoe leather or the will to work. But we can point out, based

on convincing proof, the size and character of this replacement market. Cast your eye, for example, over the accompanying list of 287 different makes of sets that were found in these 7,039 homes. Note that 64.5 per cent of these brands no longer are on the market. It is a safe assumption that at least as high a percentage are suitable candidates for that well known scrap pile.

Technical Characteristics

Our investigators* also checked the technical characteristics of each set. They found that 5,056 were TRF (76%) and that 1,486 (22%) used the super-heterodyne circuit. Only 17 were neutrodyne, 10 employed band pass filters and 10 a regenerative hook-up.

With respect to power source: 6,572 (93.3%) used a.c. line current; 55 were d.c.; 46 used A and B eliminators; 130, A battery and B eliminator, and 236 straight battery. Proportion using new air cells was not indicated.

The tube equipment study is especially interesting. Of the 6,304 tube equipments reported, 11 per cent had from one to three tubes, 12 per cent had four tubes, 60 per cent employed either five or six tubes, 12 per cent were equipped with seven tubes, while the balance, five per cent, used eight or more. Here is the tabulation:

No. Sets	No. Tubes	No. Sets	No. Tubes
3	One	1,852	Seven
11	Two	1,858	Eight
21	Three	793	Nine
100	Four	240	Ten
571	Five	85	Eleven
758	Six	12	Twelve

In all, a total of 46,335 tubes were accounted for—in 6,304 receivers. This gives an average of 7.35 tubes per set in use today.

*The Emergency Employment Committee, appointed by the IRE, gave its unemployed members a list of questions. These members then interviewed radio listeners. The Committee pays a specified sum for each list of answers. At times it checks answers by writing to persons interviewed. The office force of the Committee makes up the tabulations using the wording of the answers submitted.

They're All in Use Today

Our investigators jotted down the names of the sets which were found in the 7,039 homes visited. Notice the liberal sprinkling of "old timers" still operating in somebody's sitting room. What a replacement opportunity!

How Many of These Sets Do You Know?

ACME	EAGLE	MAJESTIC	SEARS ROEBUCK
AERO	ECHOPHONE	MASTER	SELECTADYNE
AEROLA	EARL CARROLL	MASTERTONE	SENTINEL
ABOYSHOME	ECHOTONE	MAGNAVOX	SERANADER
AIRLINE	EDISON	MANTOLA	SHERMAN CLAY
ALL AMERICAN	EL REY	MACY	SHAMROCK
AMERICAN	ELLSWORTH	MARTI	SILV. MARSHALL
AMRAD	ELECTRON	MADISON	SILVERTONE
APEX	EMERSON	MAGNAFORMER	SIRENE
ARBORPHONE	ERLA	METEOR	SIMPLEX
ATWATER KENT	EVER-READY	MELOTONE	SILVER KING
AUDIOLA	FADA	MELOTROPE	SKYROVER
AUDIOPHONE	FALCH	MELROSE	SKY RAIDER
AUSTIN	FEDERAL	METRODYNE	SLEEPER
AVON	FINKENBERG	MISSION BELL	SORBER
ARCADIA	FLINT	MIROCO	SONIA
ADMIRAL	FLORETT	MIAMI	SONORA
AIR SERVICE	FREED	MONARCH	SPARTON
AMBASSADOR	FREED-EISEMANN	MONGOL	SPLITDORF
ANGELUS	FREEDSON	MOHAWK	STEWART WARNER
AZTEC	FRESHMAN	MONTGOM'Y WARD	STEINITE
BALDWIN	GAROD	MUSIQUE	STROM. CARLSON
BEL RAD	GARDNER	MUSIC BOX	STANDARADYNE
BELNAP	GERAUD	MUSIC MASTER	STERLING
BELKNAP	GENERAL ELEC	MUSETTE	SUPER GENERAL
BELMONT	GENERAL MOTORS	MC MILLAN	SUN
BALKEIT	GILFILLAN	NASSAU	SUN GLOW
BEVERLY	GLORITONE	NATIONAL	SYMPHONY
BONA PHONIC	GLORINETTE	NORTHLAND	STARNIGHT
BOSCH	GLOBE	NORDEN HAUCK	TAPESTRY
BRUNSWICK	GOLD SEAL	OLYMPIC	TEMPLE
BREMER-TULLY	GOLDEN HALL	ORPHEUS	TEMPLETONE
BROADWAY	GRAYBAR	OZARKA	TELETONE
BROWNING DRAKE	GREBE	PARMAK	THERMIODYNE
BRANDES	GULBRANSEN	PATTERSON	THESOLA
BULOVA	HAMILTON LLOYD	PAYDYNE	THOROLA
BUCKINGHAM	HADAWAY-ELEC	PECK-HILL	THORLA
BUSH AND LANE	HARKNESS	PERRY	TILMAN
BUCHANAN	HARTCO	PETER PAN	TIFFANY TONE
CADILLAC	HAMPDEN	PHILCO	TOM THUMB
CARLTON	HAMPTON	PILOT KIT	TROY
CAPITOL	HARRISON	PILOT	TROJAN
CASE	HERALDYNE	" SUPER WASP	TRUTEST
CHI-RAD	HFL	PIERCE ARROW	TROUBADOUR
CHAMPION	HOLSUM	PLYMOUTH	TRUTONE
CLARION	HOWARD	POLYROAL	TRAVELLER
CLUB	HOWE	POLYDYNE	TUSKA SUPER
CLEARTONE	HUDSON	POLK	UNITED
CLARADYNE	IMPERIAL	POOLEY	UNITED LANSING
CLARITONE	INTERNATIONAL	POWELL	ULTRADYNE
CONTINENTAL	JACKSON BELL	PREMIER	VALLEY TONE
COLUMBIA	JACKSON	PREMIER PRES.	VICTOR
COMMANDER	JESSE FRENCH	PREMIER-TULLY	VICTOREEN
COMPOSITE	JEWELL	PREISS	VIKING
COLONIAL	KEMPER	PUBLIX	WARE
CRESCENTDYNE	KELLOGG	R.C.A.	WASHINGTON
CORONADO	KENNEDY	R.C.A.-VICTOR	WAL-TONE
CRITERION	KING	RADIOLA	WALTHAM
CROWN	KNIGHT	RADIETTE	WESTINGHOUSE
CROSLEY	KOLSTER	RADIOTROPE	WESTNER JR.
COURIER	KROEHLER	RADIODYNE	WESTERN AIR
DAYTON	KYLECTRON	RANDOLPH	" " PATROL
DAY FAN	LARK	RED RAD	WESTERN ELEC.
DAVIS SPECIAL	LANSING	RECEPTOR	WESTMINSTER
DE SOTA	LAFAYETTE	REMLER	WELLS GARDNER
DE FOREST	LANG	REGAL	WESTERNER
DIAMOND	LARKON	REVERE	WILCOX
DICTATOR	LIBERTY	RIALTO	WORLD
DORN BROS.	LITTLE GENERAL	ROYAL	WURLITZER
DREADNAUGHT	LINCOLN	ROLA	ZANEY GILL
EARL	LOFTIN-WHITE	ROOSEVELT	ZENETTE
	LYRIC	SCOTT	ZENITH

Lutto, Inc. (*Jewelry*)

SELLS *Auto Radio*



Broadus & Lucas (*Garage*)

INSTALLS



LUTTO, INCORPORATED, is a Richmond, Virginia, credit jewelry and radio house. Situated on busy Broad Street, where curbside mechanics could not work, boasting only the most cramped of repair shops, it is, one would imagine, probably the least suitable outlet for auto-radio in the entire city. Yet Lutto's, in six weeks during last October and November, sold 38 Crosley "Roamio's" at \$49.95, tacked \$10 extra on 31 bills for installation.

The concern inserted ads one Sunday in the *News-Leader* and in the *Times-Dispatch* offering auto-radio receivers on terms \$1 down. Fifty-seven people responded and 38 were found to be good credit risks. Sixteen were induced to pay \$1 down for their sets plus a \$10 cash installation fee. It was pointed out and this was the arrangement which permitted the store to sell auto sets . . . that Broadus & Lucas, of 2,500 Chamberlain Avenue, must be paid in advance to make the installations. All customers were signed up on Broad Street but went to the cooperating garage to have the sets put in their cars. Five customers were induced to pay \$5 down plus the installation fee in order "to reduce the number of payments."

THEY WORK TOGETHER

Volume auto-radio sales on low credit-terms is not the intended moral of this story. For while Lutto's time-payment financing set-up and credit jewelry experience permits him to do this kind of business it is obviously undesirable, if not impossible, for most radio stores to imitate it, despite the fact that many prospects attracted

by the low terms were induced to pay installation fees in cash, and larger down-payments.

But Lutto has proven that radio stores, even if they have no facilities for making installations, can sell automobile radio equipment and "farm out" the installations. He has no shop into which cars may be run for this latter part of the job—employs a service man who does most of his repairing in customer's homes. Yet by paying B & L a fixed sum for each job he is able to get in on the business. So far, none of the sets have required service.

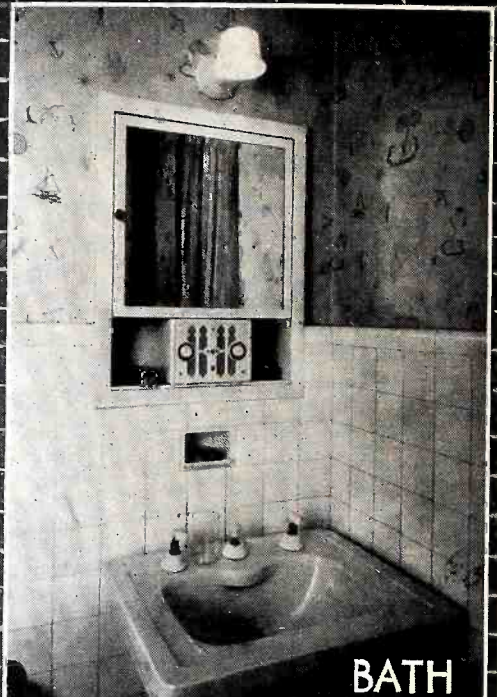
The very location which prohibits Lutto from making his own auto-radio installations insures store traffic and sales. B & L, lacking store traffic has, on the other hand, adequate space for the mechanical work.

Thus the two concerns work together . . . at a profit. And Lutto makes a statement, the logic of which will be instantly grasped by radio merchandisers: "If you can sell a product someone can always be found to *install* it!"

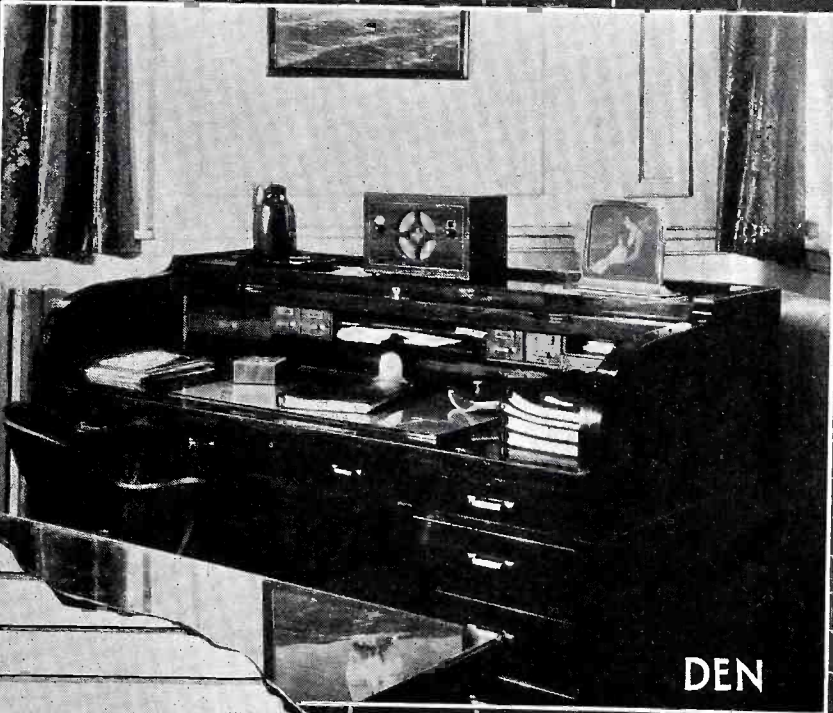
Now — RADIO



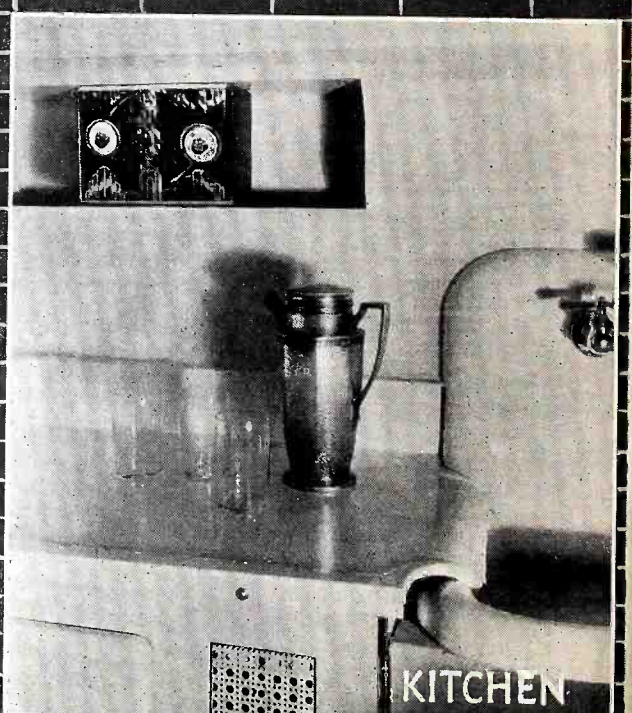
BOYS ROOM



BATH



DEN



KITCHEN

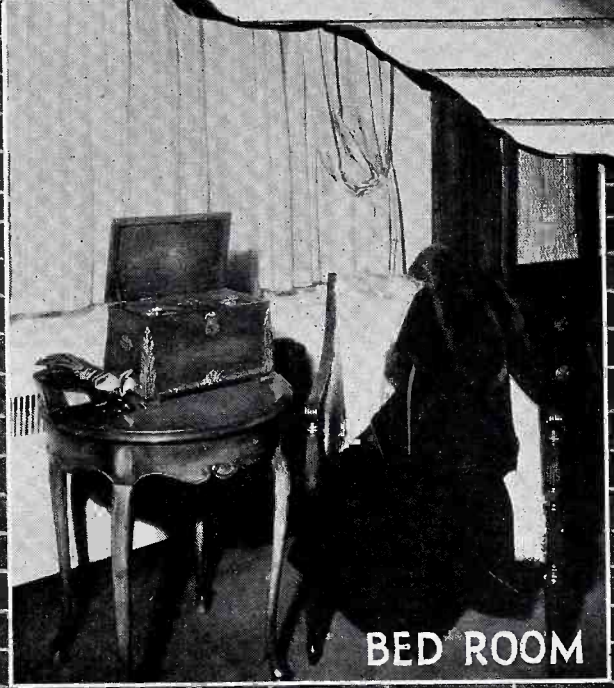
LIKE a swarm of locusts, many small radio sets, or "sub-midgets," have suddenly appeared in our midst. From the dimensions of consoles, models have swiftly contracted to cigar box proportions. Does this trend threaten the radio industry?

Dealers who value the dignity of radio as a business are opposing these Lilliputian receivers; they feel that they tend to demoralize values. Yet this surge of sub-midgets apparently will *not* be stemmed. It is

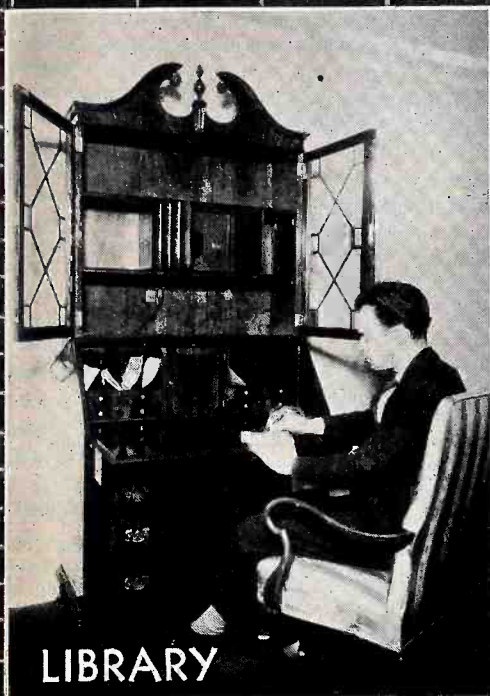
for EVERY ROOM



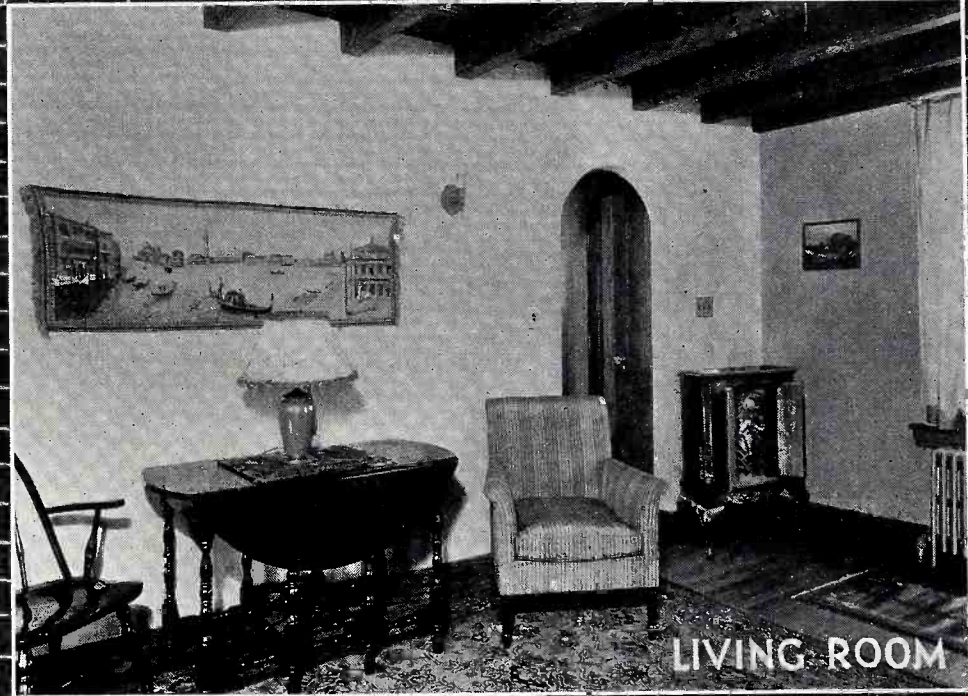
NURSERY



BED ROOM



LIBRARY



LIVING ROOM

sweeping on as the public becomes fascinated with the idea of a "personal" radio set.

So let us examine, from an unbiased viewpoint, this epidemic of "midget-midgets." Is there not, after all, some comfort—and good business—that can be extracted from this situation?

Never, of course, should these little sets be accepted as an entirely adequate substitute for real radio as ex-

(Please turn to page 27)



Service for Six

Repair specialists Lamb and Hoffman grossed \$4,900 in 1932. Sixty-five per cent came from 5 Wheeling, W. Va. dealers and a jobber

RPAIR specialists encounter a serious obstacle when attempting to sell their services to radio dealers. Merchants hesitate to turn over to any outsider the names of customers who will eventually be prospects for new equipment.

William Lamb and Charles Hoffman, proprietor and manager, respectively, of the Radio Service Laboratory, of Wheeling, West Virginia, have partially solved this problem by soliciting difficult repair jobs to be brought to the shop *by the dealers themselves*. RSL's bid for this type of business holds special appeal to those accounts which employ installation men capable of making only minor adjustments.

The regular patronage of six local concerns constitutes the backbone of the organization's business. These are:

The Front Company
 Reichert's Furniture Company
 Greer & Lang (jobber)
 C. A. House Piano Company
 Swan Lumber Company (Marietta)
 Lawrence Electric Company

All work brought to the RSL shop by these accounts is taken on individual estimates, the regular charge being \$1 per hour for labor plus necessary parts at 40 per cent off list. Replacement components are usually purchased nearer 50 off, the difference providing a slight profit margin on the materials.

Contract work, blanket compensation arrangements

with dealers, have been deliberately avoided by the management.

Fifty-five per cent of RSL's revenue is derived from its work for Wheeling dealers. Ten per cent comes from the jobber and the remaining 35 per cent directly from consumers. The trade is charged \$1.50 per hour for labor if it is necessary for work to be done outside while consumers pay \$2 for equivalent time.

Two-thirds of the company's profit is derived from the sale of labor, one-third from the margin on parts.

TWO RSL accounts were questioned concerning their reasons for employing outside repair service.

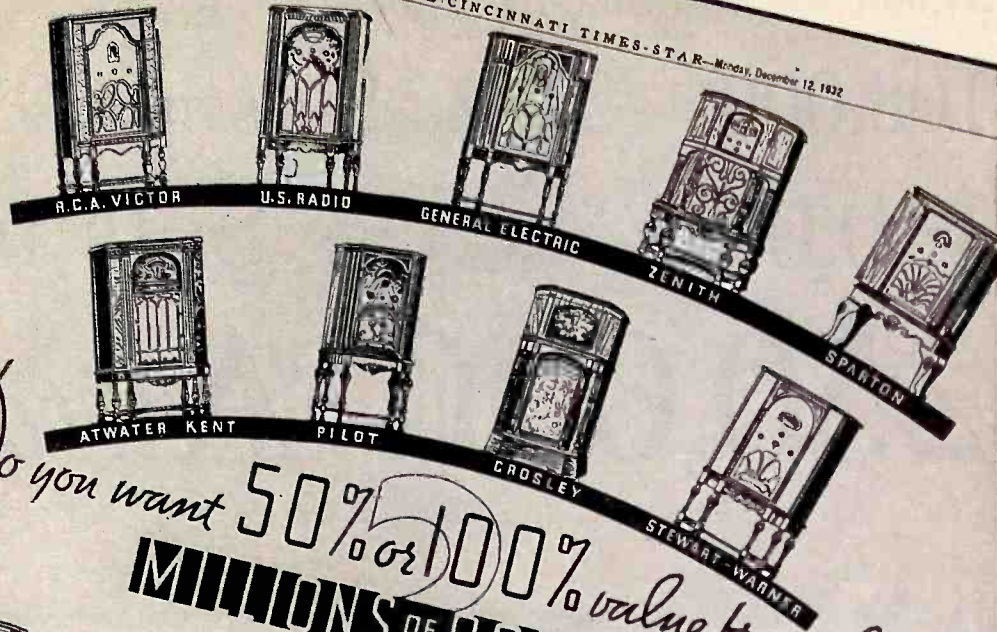
Reichert Furniture reported: "It is much cheaper for us to buy service than to provide it ourselves. We have a boy who makes deliveries and is capable of making minor repairs right in the home. If we were to handle all our own service, another man, whom we would be obliged to pay \$35 weekly, would be required. Our bill for service rarely exceeds \$10 weekly under the present arrangement. Frequently we find it possible even to make a profit on repairs."

C. A. House advised: "We have cut down our own service department in order to reduce expenses and turn all heavy work over to RSL. They do the work quite as satisfactorily as would a distant jobber, at no greater cost, and we save much time."

"Service for Six" enabled Messrs. Lamb & Hoffman to gross \$4,900 exclusively on repair work in 1932.

Radio Retailing
 endorses this campaign.
 To the trade in
 other cities—
 Fall in Line!

THE CINCINNATI TIMES-STAR—Monday, December 12, 1932



Do you want 50% or 100% value from these
MILLIONS OF DOLLARS



Every year an almost fabulous amount of money is spent on the production of radio programs for the enjoyment. The finest artists, for your world events and outstanding educational features go out on the air for the owners of radio sets to enjoy.

Similarly the individual radio stations and the broadcasting chains spend additional millions of dollars in technical improvements so that these programs will be broadcast with tone fidelity and with reliability.

Radio broadcasting stations cannot afford to use a cheap \$8.00 microphone to pick up the beautiful overtones and undertones of the wonderful musical programs they send out. In order to give you the fine tonal qualities they are compelled to use only the finest equipment, costing hundreds of thousands of dollars.

cast they must purchase a radio of equal high quality—one with precisely made, well-designed component parts? In other words, a radio that is designed with these thoughts in mind by pioneers in the industry who do have an interest in the set they purchased and paid for it.

So taking these facts into consideration, doesn't it seem false economy to butcher up beautifully conceived and transmitted programs with a cheap, unbranded radio set that has been dumped on the market at bargain counter prices?

The distributors whose names appear at the bottom of this advertisement all represent manufacturers whose products will give you the full beauty of modern radio performance. It will be to your advantage to purchase one or more makers.



The Jobbers FIGHT BACK

PHILCO

U.S. RADIO
 The York Supply Co.
 1001 and 1003 Ave. Parkway, 2nd Fl.

AMERICAN BEACH
 The Doermann-Rohrer Co.
 419 East Front St. Main 2524

COLONIAL
 Graybar Electric Co.
 314 5th St. Main 3004

SPARTON
 Cincinnati Radio Corp.
 1000 and 1002 St. Liberty 2922

PHILCO
 The Tri-State Distributing Corp.
 22 East 10th St. Parkway 306

COLONIAL
 The Fisher-Aeschbach Co.
 222 Walnut St. Main 3024

MAJESTIC
 Schuster Electric Co.
 2146 Spring Grove Ave. 1932 0214

AC-VICTOR
 Griffith-Victor Distributing Corp.
 2401 Broadway St. Parkway 126

GENERAL ELECTRIC
 General Electric Supply Corp.
 212 West Third St. Parkway 200

STEWART-WARNER
 Auto Rad Supply Co.
 1001 and 1003 Ave. Parkway 2nd Fl.

PILOT
 C & D Auto Supply & Radio Corp.
 220 West Broadway St. Parkway 224

ZENITH
 The Harten-Knodel Distributing Co.
 1110 1/2 One Eighth and Sprague Sts. Parkway 1018

ATWATER KENT
 The Johnson Electric Supply Co.
 419 East Front St. Main 2524

Sponsored by the Undersigned Members of the Radio Wholesalers' Division Cincinnati Electric Club:

THIS full page advertisement is one of five which appeared during the pre-Christmas season in the Cincinnati Times-Star. We have copies of this entire series available for any other cooperative group wishing to study them or desiring to promote a similar educational campaign. Write to

the editors of this magazine if you wish details. Radio Retailing endorses this aggressive, constructive action of the Radio Division of the Cincinnati Electric Club. It recommends that radio dealers and jobbers elsewhere in the country also tell the public the truth about radio.

34,000  Sets in 1930

108,000  Sets in 1931

140,000  Sets in 1932

250,000 *Auto-Radio*

AUTOMOBILE-RADIO will be very much worth while this year—for the radio dealer. Whereas in 1930 less than 35,000 receivers for motor cars were sold, the year just closed reveals a total of 140,000 installations, according to reliable reports recently received by *Radio Retailing*. Based on the growing receptiveness of the public for this kind of entertainment, on the satisfactory performance of today's auto set and on the aggressive promotional plans of certain motor car manufacturers and of many set makers, at least a quarter of a million of these devices should be sold during the next twelve months. This promising outlook for automobile-radio should make it one of the most important industry activities during 1933.

And right now is none too soon for the radio dealer to start laying his plans to get the lion's share of this market. In fact he will find that many sales can be closed in January, February and March because the demand for auto sets has shown no marked diminution this winter, a trend which has not previously been in evidence.

To sell an automobile set one must first get in touch with a car owner; to install an automobile set, properly, requires garage facilities. Because of these conditions the automobile dealer, the auto accessory house and the auto service station has had a finger in this pie. But auto sets must be installed and serviced by a person possessing a technical knowledge of radio. Furthermore, radio dealers, too, have plenty of friends and know plenty of prospects who drive automobiles. Then again, garage space isn't so difficult to obtain and the 1932-33 set goes in the average car without a great deal of trouble. Lastly, there's the automobile-radio specialist who gladly will cooperate with the radio dealer who wants to enter into a fifty-fifty sales and installation agreement with him.

The radio dealer has a choice, therefore, of completing the job himself or of cooperating with someone already provided with installation facilities. The first policy is gaining in favor. In fact certain radio dealers have found it good business to make installations in the prospect's own garage, featuring in their advertising:

"NO NEED TO LEAVE YOUR CAR DOWNTOWN.
WE INSTALL RIGHT IN YOUR OWN GARAGE."

Such a plan insures complete control of the transaction and an extra profit, from the installation, of from \$5 to \$10.

From the buyer's angle the auto sets now being offered meet every requirement. Although the average price,

three years ago, was \$133, today an excellent outfit may be obtained for \$65, including the B battery eliminator. Installation cost seldom exceeds \$15. The problem of suppressing ignition noises, in the hands of an experienced installer, invariably can be solved. A large proportion of the 1932-33 motor cars have built-in antennas and provide special facilities for radio equipment.

It will be seen that the real job ahead consists in locating prospects, in giving a convincing demonstration and in providing proper installation service.

A POSSIBLE TREND

An excellent illustration of how automobile radio equipment may be sold and serviced this spring is seen in the case of an active specialist in this business, located in a large New England metropolis. Originally this man owned a small radio store and did his own repairing. Attracted by the wide open opportunity for an auto-radio expert in his town he studied the problem of installation and of suppressing ignition interference. Then he rented a combined garage and sales room. Because of his success in turning out perfect installations his fame soon spread throughout the county. Recently, because of this reputation, he was approached by the maker of a well-known radio for motor cars and offered state distribution rights. This is what he told the writer:

"I have found that the radio dealer, if properly instructed, is the best retail outlet for auto-radio. When I go into a town I first call on the leading radio merchant. In less than five hours I can train his service man so that he can install the average job and locate every source of ignition interference. Occasionally a car will be found which gives trouble. When this happens my wider experience and special testing facilities are available."

In many respects this set-up appears to be ideal. Here, the newly appointed dealer is not left to his own devices but operates under the experienced eye of an expert. This policy may have far-reaching possibilities. It fits in, for example, with the thinking of the music-store type of dealer, if the following incident is any criterion: Discussing the worth of merchandising automobile-radio with the leading music merchant in the same city, the writer discovered that this gentleman previously had been luke warm on the subject—didn't see how it fitted into his business. But it wasn't a difficult matter to excite his keen interest once the new trends were explained. The final upshot of the matter was that he was introduced to my specialist friend and, between them, a mutually agree-

SETS in 1933!

able plan was evolved. It was agreed that the radio-music dealer would buy a set for his own demonstration car, would place another in the store and would sell on a 40 per cent commission. The specialist, for the time being, was to make the installations on a time and material basis.

Indicative of the technical progress in this field are the joint meetings of the auto-radio committee of the Society of Automotive Engineers with the Committee on Automotive Radio of the Radio Manufacturers Association. At the September 16 gathering of these two committees there were present eleven prominent automobile technicians and twenty set and tube designers. At the latest meeting of these groups, December 2 at Detroit, even greater interest was manifested.

ENGINEERING STANDARDS AND PRACTICES

So far the main activity of this joint committee has had to do with the preparation and acceptance of engineering standards and installation practices. As a result of this close cooperation many matters vital to the success of auto-radio are well on their way to a satisfactory solution. For example: allowing ample space for the radio chassis and speaker; the proper design of the ignition system so that a minimum of interference will be generated; designing the charging generator and the storage battery so that they will pack the necessary extra punch needed to operate the radio; the right type and correct location of the built-in antenna; furnishing spark plugs with built-in suppressors; grounding the engine and transmission to the frame and properly insulating the high tension ignition cables.

Quoting from the minutes of the September meeting of these committees, to further illustrate the nature of the constructive thinking that is taking place behind the scenes: "With regard to the suggestion that the automobile manufacturers furnish and install the ignition suppression equipment, it was shown that this is very likely to become compulsory as the ignition systems cause interference in other than the broadcast bands and the problem will undoubtedly be taken up by the Federal Radio Commission . . . It is recommended that the automobile manufacturers, rather than the radio manufacturers, furnish and install the ignition suppression equipment."

At the meeting held last month it was proposed that the RMA committee prepare standardized instructions covering ignition suppression methods, specifications for

a standard "suppressor kit" and instructions for car antenna installation. Thus the radio industry would act concertedly in presenting uniform information to the dealers and car manufacturers on this subject which is of such importance right at this time.

"UP TO THE DEALER," SAY MOTOR CAR MAKERS

Last month *Radio Retailing* questioned all the automobile manufacturers concerning their plans for radio equipment on the new, 1933 models. With few exceptions they still are vague as to ultimate policy. They have decided to equip few, if any, models at the factory and either to offer it as additional equipment or to let the car dealer sell and install the auto-radio set he prefers. Dodge was an exception to this majority policy. Quoting from a letter, under date of Dec. 5, received from the Dodge Brothers Corporation: "Our radio set and control unit is purchased complete from an established manufacturer . . . In the near future all sets will carry the Corporation trade mark only . . . All cars are designed complete for the installation of the radio set in order that the final installation be a built-in feature . . . A number of thousands of radio sets have been installed in Dodge cars over the past few years. These sets are installed at the factory on dealers' orders."

The Ford Motor Company is another automobile manufacturer out with its own set. It has a B battery eliminator, automatic volume control and an electro-dynamic speaker; sells for \$49.50 installed. Ford buys this outfit from a prominent radio concern. It does not come as initial, built-in equipment but is catalogued as an optional or added accessory.

General Motors' cars will be equipped with aerials for 1933. Its various divisions plan to purchase their radio sets direct from a radio manufacturer and not to buy parts and assemble their own jobs. Each car division, however, will use its own trade-mark in designating the auto-radio which it will be prepared to supply as optional equipment. Most of General Motors car concerns will install radios in the field through their dealers but will not arrange for initial, built-in production.

To summarize: Demand is growing, sales resistance is less, the sets deliver the goods and their correct installation offers no serious difficulties.

Yes, automobile-radio will be very much worth while this year—for the radio dealer who measures up to his opportunity.

Broadcasts Build Service Business

The DEALER

solicits service business. Hertel gives daily talks about radio and . . . Profits from sale of parts and labor charges. Business shows amazing growth

The STATION

donates "Radio Clinic" time on the air to its dealer friend and . . . Profits from sale of tubes and batteries, larger audiences and increased interest

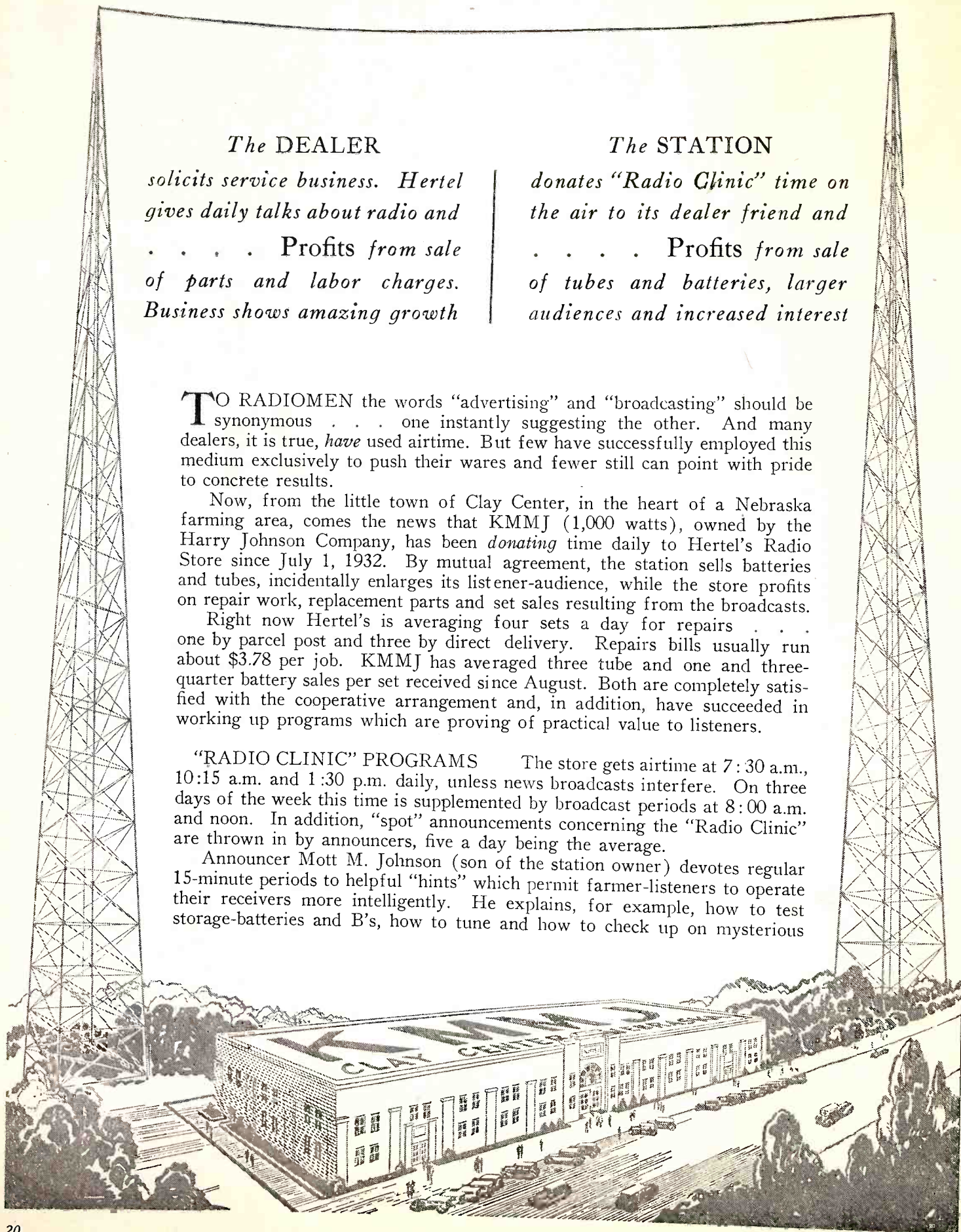
TO RADIOMEN the words "advertising" and "broadcasting" should be synonymous . . . one instantly suggesting the other. And many dealers, it is true, *have* used airtime. But few have successfully employed this medium exclusively to push their wares and fewer still can point with pride to concrete results.

Now, from the little town of Clay Center, in the heart of a Nebraska farming area, comes the news that KMMJ (1,000 watts), owned by the Harry Johnson Company, has been *donating* time daily to Hertel's Radio Store since July 1, 1932. By mutual agreement, the station sells batteries and tubes, incidentally enlarges its listener-audience, while the store profits on repair work, replacement parts and set sales resulting from the broadcasts.

Right now Hertel's is averaging four sets a day for repairs one by parcel post and three by direct delivery. Repairs bills usually run about \$3.78 per job. KMMJ has averaged three tube and one and three-quarter battery sales per set received since August. Both are completely satisfied with the cooperative arrangement and, in addition, have succeeded in working up programs which are proving of practical value to listeners.

"RADIO CLINIC" PROGRAMS The store gets airtime at 7:30 a.m., 10:15 a.m. and 1:30 p.m. daily, unless news broadcasts interfere. On three days of the week this time is supplemented by broadcast periods at 8:00 a.m. and noon. In addition, "spot" announcements concerning the "Radio Clinic" are thrown in by announcers, five a day being the average.

Announcer Mott M. Johnson (son of the station owner) devotes regular 15-minute periods to helpful "hints" which permit farmer-listeners to operate their receivers more intelligently. He explains, for example, how to test storage-batteries and B's, how to tune and how to check up on mysterious





ROGER H. HERTEL
DEALER

the man who had the idea



WALTER M. ELY
MANAGER

the man who directs repairs



MOTT M. JOHNSON
ANNOUNCER

the man who writes "copy"

noises which mar reception. This information is much valued out in the rural districts where servicemen are not just around the corner.

Then he advertises the "Radio Clinic" service maintained by Hertel's. Inquiries concerning radio troubles, he points out, will be cheerfully answered by mail and over the air free of charge. The listener's attention is also called to the repair service available through the station and Hertel's. The radio store, he announces, will be glad to completely overhaul sets, re-align them, adjust neutralizing condensers, test tubes and batteries for the small sum of 50 cents. Replacement parts required for repair will be sold at list price and installed free.

Time is devoted to a description of the construction of good A, B and C batteries. The necessity for testing tubes every 3 months, replacing them annually, is also stressed. The names of people who have sent in sets for adjustment or repair, together with a description of the troubles found and method of repair, go on the air daily.

OUT-OF-TOWN BUSINESS Although three-quarters of all sets repaired are "drive-ins," coming from users near Clay Center, the business is by no means limited to these. Farmers several hundred miles away, even over in Kansas, ship sets by mail. Most of these people are located some distance from repair shops and, knowing no servicemen, prefer to send their sets to a shop sponsored by a broadcast station. The repair of a set for a customer located some distance out in the country frequently brings more business from that section, Hertel's has noted, and one job for a customer 175 miles away brought in seven more in rapid succession.

Writing under date of December 4, Hertel's says: "Our service business is holding up very well. We have just recently got some sets from Oklahoma and Alabama and inquiries from three other states."

Repair work has not been limited to consumers. Several small dealers who do not maintain service departments of their own and others who are not equipped to handle difficult jobs patronize the shop—they were booked solely through broadcast advertising.

Practically all of Hertel's set sales in the past year

were directly or indirectly traceable to the "Radio Clinic" broadcasts. This includes several shortwave receivers and a number of auto-radios put out in the last few months. The company also does a profitable business in used replacement parts. Old receivers are purchased and their components salvaged. These are installed in repair jobs, the customer choosing between used replacements and new, at suitably different prices.

All repairs are guaranteed for three months and, backed by KMMJ, there is little question of the reliability of work. Fully 80 per cent of all sets sent in for service are battery types. Many of these have been altered to use the new low-drain tubes.

HANDLING INQUIRIES Roger H. Hertel, who owns Hertel's Radio Store, is also chief broadcast engineer for KMMJ and this close connection helped greatly in establishing the contact which has since proved so mutually profitable. Since June, 1932, the store has been managed by Walter Ely.

An engineer is in charge of the repair department and, with two assistants, it is also his duty to answer all technical inquiries received in response to radio invitation. Some of the more generally interesting inquiries are answered over the air but the bulk of them must be handled by mail, hence an extensive correspondence has grown up. Repair work has been Hertel's chief source of income in the last few months, due to the decline of set sales but it is obvious that he has his finger tips on a market which will produce much replacement business when conditions change.

"We were inspired to use broadcasting as our chief advertising medium by the article in *Radio Retailing* and by your Mr. Caldwell's excellent broadcasts in which he told the listeners to, 'See Your Radio Dealer,' " writes this Nebraska dealer. "The matter was discussed with the station manager. The data and ideas we were able to present soon sold him on the mutual worth of putting a 'Radio Clinic' program on the air."

Hertel is convinced that he has hit upon an airtime advertising plan which is valuable to his store, to KMMJ and to the rural listener.

Qualified Sets to Bear

January, 1933

Other News of the Month,

REAL IMPETUS TO "QUALITY FIRST" MOVEMENT SEEN IN THIS JOINT ACTION OF SET MAKERS

*Designed to Help Dealers "Sell Up"—
Should Increase Volume and Net Profit*

HERALDED as the beginning of a new era in radio merchandising, the directors of the Radio Manufacturers Association announce the inauguration of RMA's "Certified Seal" plan for approved receivers. Sometime this month all radio sets meeting the standards of the newly appointed RMA Engineering Institute, will leave their respective factories with a special RMA metal seal affixed in a prominent position. This seal, see illustration, reads as follows: "This Model Approved by RMA Engineering Institute."

Final plans for this new RMA merchandising project for the industry were made Dec. 14 by the Board, meeting at the Commodore Hotel, New York, president Fred Williams presiding. Leading manufacturing executives were present. Only RMA members may use these seals. Receiving sets thus distinguished should, it is hoped, gain the confidence of jobbers and dealers as well as the buying public.

To be Given Wide Publicity

Vigorous promotion and publicity, first with the radio trade and second with the public, will accompany use of the seal plan, which has been most successfully used by the Good Housekeeping Institute and also in promoting sales of many other industries. The RMA seal is being registered as a legal trade mark and its use will be amply protected.

The plan was developed by the Set Division, Arthur T. Murray, Springfield, Mass., chairman. There was established by the Association a new RMA Engineering Institute to provide engineering standards and requirements for receiving sets bearing this official seal. The Institute has an engineering board, appointed by Franklin Hutchinson, chairman of the RMA Engineering Division. It comprises leading radio engineers. These are: Ray H. Munson, Rochester, N. Y.; L. F. Curtis, Springfield, Mass.; Dr. C. S. Brigham, Newark, N. J.; Walter E. Holland, Philadelphia, Pa., and E. T. Dickey, Camden, N. J.

Performance Requirements

To insure reliability of manufacture and performance, receiving sets bearing the seal must meet the requirements of the new Institute. Sets bearing the seal shall have been submitted to and approved by the National Underwriters Laboratories; shall cover the entire U. S. and Canadian broadcast band from 540 to 1,500 kilocycles; shall be non-interfering in accordance with RMA standards; shall not exceed 10 ft. radiation from the chassis and five ft. radiation from the



antenna, and shall meet the quality and performance standards of the RMA. These are the initial standards in inaugurating use of the official seals and are flexible, being subject to future development.

Many leading set manufacturers already have placed large advance orders for the new seals. In addition to the industry promotion in connection with the seals, manufacturers using them will widely supplement the RMA promotion by advertising and efforts through their jobbers and dealers.

While the initial use of these seals will be confined to sets, their application to other radio apparatus is contemplated.

Wells Now "Chief Engineer"

A. S. Wells, president of the Gulbransen Company, Chicago, is the new "Chief Engineer" of the RMA. He was elected unanimously by its Board to head the Association's Engineering Committee, succeeding Franklin Hutchinson, of New York, who resigned.

To Standardize Parts

The RMA Parts Division, headed by Leslie F. Muter, of Chicago, and the Standards Committee of its Engineering Division, are both engaged on the important work of standardization of component parts. In this connection a meeting of Chairman Muter's Executive Committee is planned this month to receive a report from F. C. Best, of its

sub-committee, on the question of standardizing new parts developed early in 1933 for submission to set manufacturers. On January 6, at Cleveland, there will be another meeting on the question of parts standardization to which engineers of parts manufacturers have been invited by Chairman Virgil M. Graham of the RMA Standards Section. At this meeting the Standards Section will undertake preparation of specifications of tests on component parts to be worked into requirements for use on the RMA seal on radio receivers.

For Fewer New Tubes

The Board of Directors, RMA, at its meeting Dec. 14, took further steps to reduce the number of minor new and unnecessary tubes. The Tube Division, headed by S. W. Muldowny, New York, and the Set Division, chairman Arthur T. Murray, detailed the serious problems in connection with unnecessary minor tubes. Further cooperative measures between the set manufacturers and their engineers with tube interests were planned with a view to preventing injection into the industry of minor and unnecessary tubes but without substantially retarding the art. Engineers of set manufacturers are being urged to make no request upon tube manufacturers for any new designs unless there is some substantial and real improvement involved.

The Tallest Radio Tower in America



Fourteen miles out of Nashville, Tenn., the new vertical radiator type antenna of Station WSM rises 878 feet in the air—the tallest radio tower in America. This 150-ton shaft is the tangible symbol of WSM's increase in power from 5,000 to 50,000 watts. It operates full time on a cleared channel.

RMA Seal of Approval

Arranged for the Busy Reader

New York, N. Y.

Radio Wholesalers Join League of Niagara Frontier

Co-operative radio market development on the Niagara Frontier received its greatest boost last month when the directors of the Electrical League of the Niagara Frontier announced they had approved the application of a group of prominent radio wholesalers to form a Radio Wholesalers Section.

Under the sponsorship of this new section a radio window trimming contest was conducted prior to Christmas as well as a "radio show" in the sales rooms of the Buffalo General Electric Company.

The Radio Wholesalers Section at the present time includes the following companies: H. B. Alderman, Inc., W. Bergman Co., Bihl Bros., Buffalo Talking Machine Co., General Electric Supply Corp., Graybar Electric Co., C. Kurtzman Co., McCarthy Bros. & Ford, New York Talking Machine Co., Philco Distributing Corp., Jos Strauss Co. and L. A. Woolley, Inc.

Auto Sets Taxable at 2%

The U. S. Treasury has ruled that automobile radio sets specifically designed and primarily adapted for use in automobiles are considered automobile accessories within the meaning of section 606 (c) of the Revenue Act of 1932 and are taxable when sold by the manufacturer at the rate of 2% under that section, rather than at the rate of 5% under section 607.

"When such sets are sold by the manufacturer to a dealer for resale or for installation by him, or to a consumer, the tax is imposed at the rate of 2% under section 606 (c)," this reports reads.

Silvey on Pacific Coast for Tung-Sol

Chas. Silvey, who has spent all of his active business life in wholesale merchandising on the West Coast, has been appointed manager of the Pacific Coast Division of the Tung-Sol Lamp Works, Inc.

RMA Moves Office to Washington, D. C.

The Radio Manufacturers Association soon will be numbered among the many prominent trade organizations maintaining headquarters at the National Capital. RMA offices this month will be moved from their present location at 307 North Michigan Avenue, Chicago, to Washington, in charge of Bond Geddes, executive vice-president and general manager of the Association.

INSTITUTE OF RADIO SERVICE MEN CONVENE AT CHICAGO JANUARY 9-11

Holds "First Intersectional" at the Sherman

The service profession will take a step forward when, at Chicago, January 9-11, the Institute of Radio Service Men holds its first intersectional convention at the Hotel Sherman. All service men, whether they are members of the Institute or not, are invited to attend any part or all of the two day meetings.

Fifty-seven exhibit spaces have been leased to manufacturers, distributors, schools, laboratories and publishers. The first technical session will start at 1:30 p.m. Monday, and will continue, with a recess for dinner, until

late that evening. The mornings of the 10th and 11th will be devoted to trips to various points of interest in Chicago, including the World's Fair Buildings, one of the Commonwealth Edison substations, Underwriters' Laboratories, Western Television transmitting station studio for a demonstration of reception, National Broadcasting Company's studios, Columbia Broadcasting Company's studios, and one or more radio factories.

The following partial list of qualified speakers and their subjects gives a good idea of the "meaty" character of the material to be discussed:

J. N. Golten, service manager, Stewart Warner Corp., "Necessity for Education in Radio Servicing."

Tobe Deutschmann, president, Tobe Deutschmann Corp., "Problems Involved in Installation of Noise Reducing Antenna Systems."

Walter Jones, commercial engineer, Hygrade Sylvania Corp., "Manufacturing Practices that Determine Performance of Vacuum Tubes in the Field."

W. W. Garstang, vice-president in charge of engineering, Electronics Laboratories, Inc., "The Use of Electrolytic Condensers in Radio Circuits."

E. W. Butler, engineering department, RCA-Radiotron Company and E. T. Cunningham, Inc., "Tubes."

Arthur G. Mohaupt, president, Radio Training Association, "Noise Suppressor Circuits—Automatic Volume Control."

E. N. Rauland, The Rauland Corporation, "Public Address System and the Service Man."

Addresses will also be delivered by John F. Rider, editor of "Service"; by J. C. Hoover, president of Hoover Laboratories, Inc., Detroit; by H. W. KaDell, engineering department, Eveready Raytheon Company; by A. J. McMasters, G-M Laboratories, Inc., and by H. S. Williams, assistant sales manager of the American Automatic Electric Sales Company.

Tubes, photo-electric devices and the remote control applications to the industrial field, will be discussed by these gentlemen.

Major credit for the promotion of this affair goes to Kenneth Hathaway, executive secretary of the IRSM, who has labored long and faithfully to organize service men on a national basis.

Plan to Attend!

**Institute of
Radio Service Men**
(Gen'l. Hq.: 510 N. Dearborn St., Chicago)
CONVENTION
Hotel Sherman, Chicago
January 9-11, 1933



Hear these speakers, and others:

JOHN F. RIDER, Radio Treatise Co.
ENGINEER, Weston Elec. Inst. Co.
J. C. HOOVER, Hoover Laboratories
H. W. KADELL, Nat'l. Carbon Co.
ENGINEER, Chi. Telep. Sup. Co.
WALTER JONES, Sylvania Tube Co.
W. W. GARSTANG, Electronic Laboratories
J. N. GOLTEN, Stewart-Warner

EXHIBITION OF
LATEST SERVICE DEVICES

Fada Fights Price Cutting

To combat year-end dumping, the Fada Radio & Electric Corp. comes out frankly, in a series of special bulletins to its dealers and jobbers, exposing the sly technique of these practitioners and giving helpful suggestions for meeting this situation.

"Stick with the set maker who never undercuts its own dealers," suggests General Manager R. M. Klein in a message entitled: "What Are You Doing to Protect Your Interests?"

We were particularly intrigued by the poem which headed the second bulletin on this subject. Here it is:

"Firm upon the solid rock
the ugly mansion stands
Come take a look at my palace
built upon the sand."

The D. R. Bittan Sales Co., Inc., 27 Park Place, New York City, has been appointed Eastern representative for the American Microphone Co., of Los Angeles, Calif.

3,500,000 Radio Fans Can't Be Wrong



A special force of seventy tabulators worked for weeks classifying and counting the returns. Is the public losing interest in broadcasting? Look at these stacks of ballots and write your own answer.

Downey, Dragonette, Vallee, Wynn, Rubinoff, Gordon, and Young Winners in American Bosch Radio Star Popularity Poll

EXCEEDING in magnitude the expectations of its most enthusiastic sponsors, the First Annual Radio Star Popularity Poll, conducted by the United American Bosch Corporation, Springfield, Mass., closed under a deluge of 3,500,000 ballots.

There were eight classifications: Morton Downey was hailed as 1932's most popular man singer, to the tune of 1,597,786 votes. Diminutive Jessica Dragonette lead the women singers with a total of 905,846 votes. Rudy Vallee's popularity, according to the expressions of sentiment registered in this contest, continues with amazing strength from year to year—1,565,857 fans voting him the gold cup as Radio's outstanding orchestra leader. And, in the comedian class—well, there's only one Ed Wynn. But it was a battle royal among the funny fellows. The "Perfect Fool" pulled 856,634 votes, "winning" (pardon our pun) by a neck over those comers, Eddie Cantor, Jack Pearl, Jack Benny and Burns and Allen. In the instrumentalist classification Rubinoff lead, 1,312,985 votes. Another favorite, in the actor group, received first honors, Richard Gordon ("Sherlock Holmes") heading the list. The A & P Gypsies rang the bell as the most popular "miscellaneous" act. And last, but not least, the announcers: John S. Young pulled 1,211,334 ballots.

The race was a close one. Here are the four "runners up" in each class: Men singers—Frank Parker, Lanny Ross, Ralph Kirberry and Bing Crosby; women singers—Kate Smith, Ruth Etting, Pickens Sisters and the Boswell Sisters; Orchestra leaders—Guy Lombardo, Ted Weems, George Olsen, Vincent Lopez, Paul Whiteman and Ben Bernie; Comedians (see preceding); Instrumentalists—Harry Reser, Ann Leaf, Ernest Hutcheson and Little Jack Little; Actors—Raymond Knight, Phillips Lord, Joe Bell and Elsie Hitz; Announcers—David Ross, Milton Cross, Ted Husing and Graham McNamee.

It is of interest that, although the contest was national in scope and many ballots came from points West, New York chain artists, won most of the honors hands

down. Stage celebrities, replanted in broadcasting studios, are holding the "spot" these days.

Presentation of the golden cups was done in the grand manner. A Ludington air liner took the fortunate ones, Jan. 3, to Washington, D. C. There, on the steps of the Nation's Capitol, Vice-President Curtis did the honors—aided and abetted by a Coast-to-Coast national hook-up.

We are advised that the names of 3,100 different radio performers were written on the 3,500,000 ballots received and that it was necessary to classify and count over 25,000,000 names.

P.A. WINDOW TRIM WINS FIRST PRIZE

*Robert Lehfeldt, Miami, Fla.,
Submits Best Sales Idea in
Shure Brothers Contest*

What can be done to increase the sale and use of public address equipment? Shure Bros. Company, Chicago, Ill., sound amplification specialists, wanted to find out, so it staged a "PA Sales Idea" contest.

First prize, a portable P.A. system, goes to Robert H. Lehfeldt, of the Flagler Radio Company, Miami, Florida. Here is the gist of his prize winning idea:

"The idea that went over," writes Mr. Lehfeldt, "was a window display of public address equipment such as amplifiers, large tubes, dynamic speakers and microphones. These mikes stopped the passer by more than any thing else. The public has seen many pictures of microphones but not the actual article. Hundreds stopped, looked—and came in.

"A show card explained the many uses of P.A. and our renting plan. Formerly we displayed only radios in our windows; now, at least one week every two months, we put in a P.A. trim. It certainly brings business we otherwise would miss. Direct results to date: one outright sale and five rentals. And it is, by far, the cheapest advertising we do."

Second and third prize winners in this contest were, respectively: Paul L. Thornburg, Huntington, W. Va., and George Gimera, Bradford, Pa.

Sales Tax Relief

RMA, under the leadership of Paul B. Klugh, Chicago, chairman of its Legislative Committee, is behind an effort to secure relief from the radio excise tax.

Microphones Speed Service and Save Space in Soda Store



Is the honorable profession of "soda jerker" doomed to disappear—"Her Hero" being relegated to the basement to concoct sundaes in solitary "confinement," taking his orders by mike and loudspeaker from an attractive waitress on the ground floor?

At Loft's, New York City, this has actually happened. Sodas are mixed in the basement and delivered to the waitresses by dumb waiter. Service is speeded and customers deal only with this young lady behind the counter.

Mr. Skinner Justifies Philco's Price Policies

"It isn't so!" declares Philco, in a frank letter, under date of Dec. 21 to its distributors. This four-page justification of Philco's price policies, signed by James M. Skinner, president of the Philco Radio & Television Corporation, contains much of general interest to the industry. Space does not permit the inclusion of the more personal or promotional parts of this document. Apart from these omissions, the letter follows:

"The radio price situation is undoubtedly bad. Our competitors accuse Philco of creating this situation, which isn't true. There have always been and there probably always will be radios selling below Philco. RCA royalty figures prove this. Every year the average selling price of Philco sets has been above the average selling price of all radio sets paying RCA royalty.

"We have been fairly successful in producing better radios at prices near enough those of competition to capture a good share of the market. We have never led the price cutting, but have always defended our leadership against the price cutting of others, gypps or otherwise. At the same time, we have, year after year, successfully merchandised 'selling up' models offering real value and greater profits.

"To defend its leadership Philco is producing today radios in the low price field which meet all comers, but Philco does not believe and never has believed that the ultimate goal of radio is a \$9.99 midget. Philco believes and always has believed that the public will buy a radio as a musical instrument, at prices which will give them value for every dollar they pay, and still enable dealer, distributor and factory to make a fair profit.

"It was probably inevitable that the radio price war should occur. If it had to occur, it was probably better it should go all the way to the bottom, so that no doubt would be left in any dealer's mind that only losses lay along that path.

"But now, from the standpoint of self-preservation, the time has come when thoughtful dealers must ally themselves with some strong manufacturer who has the reputation, ability and courage to give them the kind of merchandise and the kind of advertising which will help return a profit to the dealer's pocket."

Insolvency Record Improves

According to Dun's Review, the insolvency record of the radio industry has taken a turn for the better during 1932. While the number of failures for the eleven months of 1932 was slightly larger, 180 compared to 175 for the entire twelve months of 1931, the involved liabilities of the defaulting firms this year was less by 60.8 per cent. That is, the firms in both the manufacturing and distributing branches that failed during the current year were chiefly small ones. The special compilation of insolvencies in the radio industry made by R. G. Dun & Co. shows that the total defaulted indebtedness in 1931 reached a peak level of \$9,067,804, which during the 11 months of 1932 dropped to \$3,551,487.

DETECTOR

Howard's unit sales spurred to a 48 per cent increase, upped 41 per cent in dollars, following the adoption of its new Guaranteed Direct Profit Plan. The books recorded a 200 per cent increase in dealers. Writes adman Burton Browne: "This is no hokey. It's true. And the plan is based on *Radio Retailing's* editorials!"

Have you a photographic mind? Can you remember all the technical dope on new tubes? Sylvania has a new characteristic chart complete with socket connection details. Write to Emporium, Pa., for it—or to the new New York office at 500 Fifth.

May Radio, Philco's New York distributor, is ballyhooing its second annual "floating" convention. All dealers have to do to qualify is reach their quota of "X" model sales. Time: Next Decoration Day. Place: Havana, "Pearl of the Antilles," "Paris of the Western Hemisphere," "Monte Carlo of the Americas."

Lee McCanne, son of president W. Roy, became head of the "Telektor" division of Stromberg-Carlson in December. Lee is a product of M.I.T.

Capehart sends in the following gossip: C. W. Emley is now district sales manager for the New England territory, New York City excluded. George Shaffer manages the Philadelphia district, including Jersey, Delaware, Maryland, D. of C. and eastern Pennsylvania.

Pierce-Airo, maker of DeWald and Motortone receivers, obtained Hazeltine and Latour Corporation licenses late in

December. The outfit has had RCA's okeh for the last 10 years.

Jack Leban is peddling sets in and around Philadelphia for Radio Chassis.

Charles Silvey is Tung-Sol's new West Coast manager, with headquarters in L. A.

Walt Coogan of Arcturus is back in the States after a 10-week tour of Europe, bragging about his personal "auditions" with the President of Spain and the Sultan of Morocco, both Blue Tube users.



Sears - Roebuck's battery-set sales have been moving forward steadily and now constitute 50 per cent of the concern's radio business, 30 per cent being through rural stores, 70 per cent via the mails. Manager V. A. Kamin attributes continuance of set

sales to shortwave programs, police broadcasts and improvement in battery set models.

Edwin C. Hill, CBS's news commentator, received this letter the other day: "Dear Mr. Hill—Whether you know it or not, your broadcasts have cost me \$50. My three children insist upon listening to a series of bed-time stories and my wife and I insist upon tuning in on your programs at the same hour. So I had to buy another set." Here's a tip salesmen!

Another Display Car Hits the Trail



Over 500 people pass through this display car, when it's parked in front of a dealer's store. It was designed by the president of the firm which owns and operates it, A. M. Cronin, Jr., of Cronin Distributing, Inc., Portland, Oregon. It's wired for 110 volts and provided with loudspeaker equipment



RECORDED *Music*

WHAT is the greatest adjunct to disc sales once the records are released and ensconced in the dealer's shelves? Naturally, an up-to-date catalogue of all publications. Sales people and customers dislike thumbing through three or four old catalogues and as many supplements in order to locate desired recordings. Victor's last complete catalogue appeared in 1930. Since then billions and billions of musical vibrations have passed through microphones to be engraved on discs. A new complete catalogue has been badly needed. The news of the month, we believe, is the current publication of a new general RCA Victor record catalogue listing, after a judicious process of elimination, the Red Seal and Standard music contained in the 1930 edition and issued since. But that is not the most important thing.

For the first time in the history of record making, the public is taken into Victor's confidence as regards future recording plans. A great number of recordings listed are marked "in preparation." These are works which have been scheduled for recording or that have been recorded; but for one or more of a variety of reasons, must await their opportune moment. It is announced that these "in preparation" discs will be available within twelve months. Just what does this highly commendable idea portend?

Lovers of recorded music will better be able to budget their disc purchases for a year or more. They will know in advance Victor's Red Seal and Standard recording plans. *Dealers will be able to take advance orders, previous to release dates, and thereby justify the quantity of their own buying.* Because of this every Victor dealer and sales person should study the new lexicon diligently.

Current popular discs—jazz, vocal, hot numbers—are not listed in the new edition, which is just as well because generally these hits of the hour are seldom in demand three months after their initial release.

The procedure throughout the alphabetical listing maintains the splendid standard of easy location and identification which characterized every Victor catalogue. There is a special section devoted to long-playing records and Musical Masterpiece sets.

RECENT Philadelphia Orchestra recordings have displayed unusual qualities of tone and general reproduction. The *Tristan and Isolde* Symphonic Synthesis (an

arrangement of Wagner's passionate music by Leopold Stokowski) and the Sibelius *Fourth Symphony* recordings mark additional advances in the art of musical reproduction. Play them for your more cultured customers. Demonstrate also the long-playing versions of these masterpieces.

Be on the lookout also for the new Victor records of music from *The Dubarry*, the most popular Broadway operetta. Grace Moore, star of the show, and Richard Crooks made two ten-inchers the other day of this melodious and lilting music. Nat Shilkret conducted four songs from the Millocker score.

Long-playing discs have taken a spurt lately, due mostly to the availability of two-speed turntables. Victor's job is constructed in three models to fit most Victor instruments. The Audak Duo-Disc, one of the finest bits of mechanical engineering we have ever examined, may be adjusted to any motor regardless of model or make.

COLUMBIA'S new Masterwork set, Beethoven's *Violin Concerto*, played by Joseph Szigeti with an orchestra conducted by Bruno Walter, is one of the finest recordings we have ever heard. The new Royal Blue material does away with almost all surface noise. Maestro Walter is now to be heard on the Sunday broadcasts (Columbia Network) of the New York Philharmonic-Symphony Orchestra. Push this set. It is priced at a ridiculously low figure, considering the talent one gets, and will have an appeal for all lovers of good music.

Other Columbia discs include new dance orchestra records by Rudy Vallée, Ben Selvin, Frank Trumbauer and Fletcher Henderson.

BRUNSWICK'S march of triumph continues: Ethel Merman and Al Jolson recently signed Brunswick contracts and made a series of recordings to be released in the near future. Look for them.

Three Brunswick records that shoot right down the alley for a strike are: *What a Perfect Combination* and *Look What You've Done*, from Eddie Cantor's picture "The Kid from Spain," played in Ozzie Nelson's best manner (No. 6447); the "hit of the hour" *Night and Day*, Cole Porter music from "The Gay Divorce," by the aristocratic Eddy Duchin and his Central Park Casino Orchestra (No. 6445); and *The Man from Harlem* and *My Sunday Gal* (No. 6450) scintillated by the irrepressible Cab Calloway.

Dealer Brackenridge Comments on the Cincinnati Campaign

W. W. Brackenridge, owner of the Broadway Radio Mart, Harrison, Ohio, presents a dealer's viewpoint on the price situation and concerning the Cincinnati campaign for quality in radio (see page 17), when he writes *Radio Retailing*:

After we thought we had the radio public priced and sold "up" and out of the midget zone all our dealer efforts were "shot" for the year by the introduction of the "less-than-\$20" set; and the sales of the hard working retailer further undermined by the persistency with which "off" brands and "wild cats" were thrust before the buyer.

I hope you read—and publish—that splendid ad, which appeared recently in the *Cincinnati Times Star*. It "rings the bell." More jobbers should fight back in this manner and educate our prospects. Here's *real* cooperation and a "buy up" lesson for the consumer.

W. W. BRACKENRIDGE

"Uncover Agents" are Lead Producers

DELIVERY truck drivers, milk and laundry men, for example, and all other persons whose work brings them into contact with the daily life of the people, will dig up more and better sales leads than any other medium I know of," declares E. T. Shields, proprietor of

Shields Radio Shop, Riverside, California. He calls these assistant salesmen his "Uncover agents." Sometimes they complete the deal unaided.

"Owing to the economic situation a full-time salesman finds it hard to make a living selling door-to-door for a neighborhood dealer," continues this West Coast merchant. Therefore house canvassing is practical, in my case at least, only when done as a side activity by one whose regular work takes him into homes constantly.

Via Mail Box to Phone Book



OUR Chicago representative found the above little gummed label in his mail box the other evening. "Stick me on your phone book," says this clever piece of "reminder advertising." SOS is getting 100 per cent neighborhood coverage at the cost of a few dollars.

A Radio for Every Room (Continued from page 15)

pressed in today's highly developed console receiver. Because of the necessary technical limitations of the midget it cannot be expected to occupy the place in the living room around which the family gathers for musical enjoyment. But a simple comparison of a mantle model with a real console musical instrument is needed to—"Demonstrate the Difference."

But, are there not many places where a second set, a compact set, or a *personal* model, is *needed* and has a *real usefulness*? We think so. Here are some of those places:

Radio for the kitchen. To while away the tedious hours of food preparation or dish-washing for the housewife. Or to give the maid her own selection of programs.

"Just a little set for the old folks." People of the passing generation have their own distinctive taste in radio entertainment. Chiefly they like lectures and eavesdropping on meetings and dinners. The midget is at its best on speech.

A business man's set. Frequently the man of affairs wants to hear some address, scheduled for the daylight hours. Or he must know the latest commodity or stock market quotations. These figures are there, *waiting in the air*, yet without a desk radio they are lost to him.

For the student at college. Radio today is the world's greatest educational force. Yet the student without a set is out of touch with our greatest thinkers. Such a receiver must be personal, compact, easy to carry and not too loud.

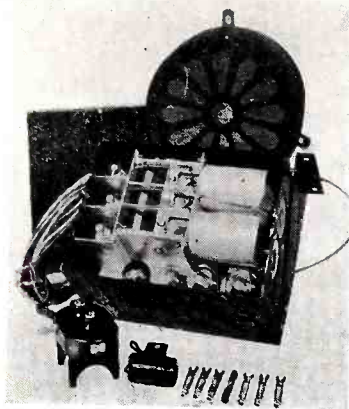
For the nursery and young folks. Parents have been driven to distraction by listening to Uncle Willy stories and tales of ogre adventures, in which their offsprings delight. Parental paresis can be forestalled, and the children made happy in their isolated playroom, by giving them a radio of their own.

For the servants. The girl "in service" leads a lonely life. She cannot share in the household's radio entertainment. And she has her own ideas about what she likes. To the maid a personal set is a godsend. And the chauffeur, who waits for calls more hours than he actually drives. A small set will make his job endurable—and "on call" when needed.

In the recreation room. The oil-burner has added another room to the modern house, converting the erstwhile cellar into a place of cheerfulness. People playing ping-pong are not exactly in a tone-critical mood, yet they want a background of spirited music. Or they may want to interrupt the game to listen to Wynn or Cantor. Another place for a compact, auxiliary set.

The tiny radio *never will take the place of the full-tone quality receiver*—the paramount musical instrument for the home. If anyone doubts the shortcomings and tone crudities of the little set, let him hear both kinds—"Demonstrate the Difference." But, after a household has been sold adequate quality reception, it is possible, by enlisting the personal set idea, that more radio merchandise can be sold to that home than would be the case if this opportunity were ignored.

NEW AUTO-RADIO SETS



Autocrat Auto Radio

Model A-6 automobile radio of the Autocrat Radio Co., 3855 North Hamilton Ave., Chicago, Ill., is a 6 tube set employing a t.r.f. circuit using the following tubes: 2-239's, 1-236, 1-237 and 2-238's. It lists at \$34.90 complete less B-batteries. It has two shielded connecting cables with plugs for quick connection to all accessories. Accessories include illuminated dial, lock switch, remote control for attaching to steering column, dynamic speaker and spark suppressors. It covers from 195 to 550 meters and is adjustable to 175 meters (police calls) if desired.

The Dictator model has 7 tubes, a.v.c., and uses two 29's, a 36, two 37's, and two L.A.'s in push-pull. This model lists at \$69.50 complete with accessories but less batteries and aerial. Both prices are factory, Chicago.—*Radio Retailing*, January, 1933.

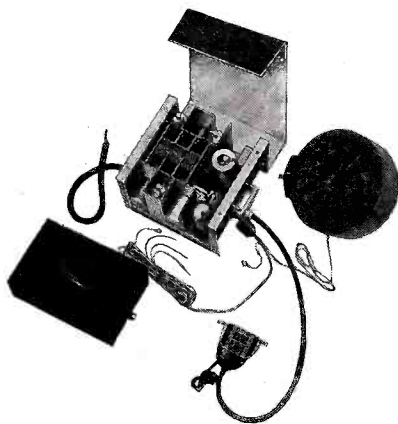
"Automatic" Auto Radios

Two automobile radio sets have been placed on the market by the Automatic Radio Mfg. Co., Inc., 112 Canal St., Boston, Mass. The first is a four tube receiver using a 36, a 41, and two 39's. \$19.95 complete.

The second is a six tube set using one each of the 36, 79 and 41 types, and three 39's. This set is priced at \$39.50 complete.

Both receivers are compact and constructed so as to enable the ordinary individual to make complete installation himself in approximately thirty minutes, the folder states.

Automatic also announces a new B eliminator said to be constructed on an entirely new principle.—*Radio Retailing*, January, 1933.



Motovox Auto-Radio

An all-electric and a battery operated motor car set bearing the trade name "Motovox" can be obtained from the Moto-Meter Gauge & Equipment Corp., Toledo, Ohio. These sets employ the "Moto-Tetradyne" circuit, a circuit three years in development.

Battery model 10-E takes four 36 type

tubes and a 41 and electric model 10-A uses three 36's, an 85 and a 41.

These sets have remote control, one knob taking care of both tuning and volume control. The complete receiver, speaker, control and harness are assembled at the factory so no soldered connections are necessary to install. Removal of the entire unit for installation in another car takes about 15 minutes and leaves no visible marks. The power unit in the all-electric model is separate. A.V.C. is incorporated.—*Radio Retailing*, January, 1933.

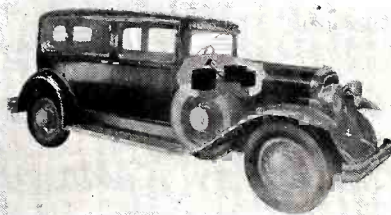
Karadio Automobile Sets

The 1933 models of the Karadio Corp., Minneapolis, Minn., consist of a six-tube, one-piece all-electric superheterodyne using three 36's and one each of the 85, 41, and 82 types. List, \$59.50.

A seven-tube all-electric superhet employing three 36's, an 85, two 41's and an 82 is \$74.50.

Karadio is also going to make a two-piece, all-electric superhet five-tube set (3-36, 1-85, 1-41), which will carry a list price of less than \$50.

This company manufactures the "No-Bee" unit in two sizes. One a No. 2 unit which delivers 180 volts, 135 m.a., with an input of 6 volts at a 1½ amp. drain and a No. 1 unit which delivers 135 volts, 35 m.a., and has an input of six volts with less than 1 amp. drain. Price of either unit is \$19.80.—*Radio Retailing*, January, 1933.



RCA Victor Motor Car Set

A low priced auto radio set is now being made by the RCA Victor Co., Inc., Camden, N. J. For battery operation the price of the M-32 is \$49.95; with dynamotor, \$69.50. The battery box lists for \$4.50 and the antenna plate for \$2.75.

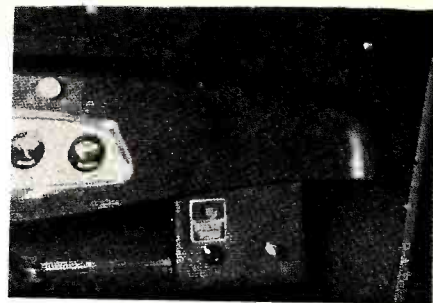
This is a six tube superheterodyne job with a.v.c. It is housed and completely shielded in a steel case 7½ in. high, 6½ in. wide, 8½ in. deep, designed for ease of installation. The tubes used are three 39's, a 37, a 35 and one 89. The speaker is equipped with tone equalizer. The illuminated dial clamps on the steering column.

Standard equipment includes a set of six spark plugs suppressors, one distributor compressor, and two capacitors. While the plate antenna may be used, it is suggested that a roof antenna be used for best results.—*Radio Retailing*, January, 1933.

Atwater Kent Auto Radio

Model 756 auto radio set is for under-the-floor mounting and Model 636 is for dash mounting. Both are the product of the Atwater Kent Mfg. Co., Philadelphia, Pa. The tubes used are two 41's output; an 85 second detector, a.v.c., and first audio; two 39's, r.f. and i.f. and a 36 first detector oscillator. The speaker is a large sized dynamic and this set uses a Dynamotor.

The dimensions and design of the two types are such that installation is easily accomplished at small expense.—*Radio Retailing*, January, 1933.



Auto-vox Auto Radios

Easily installed in any car, bus, motor-boat, Model 66 Auto-vox receiver of the J. A. Brookman Co., 1341 S. Broadway, Los Angeles, Calif., has a.v.c. and illuminated dial. The tubes used are four 39's and a 41. Priced at \$39.75 complete.

Model 75 is a six-tube superheterodyne listing at \$47.75. This set features Wunderlich full wave detector and a.v.c. Six tuned stages in a high gain intermediate amplifier are incorporated.

Both sets can be used as all-electrics.—*Radio Retailing*, January, 1933.

Acme "Moto-Midget"

The "Moto-Midget" of the Acme Mfg. Co., Miamisburg, Ohio, is self contained, that is, the set, speaker and controls all are housed in the same cabinet. For this reason it can be moved to any position. It is a five tube set: two 78's, a 77, a 76, and a 79.

Full vision dial and spot light tuning are a feature of this radio which sells for \$29.50. It is shipped complete with all necessary suppressors and condensers, adjustable mounting brackets, cable and hardware.

An all-electric model, also self-contained, may be had for \$39.95 with the same accessories. This set is a 6 tube superheterodyne with new full wave rectifier circuit and using a new time delay a.v.c. The tube equipment consists one each of the 78, 77 and 58 types, two 85's and a full wave rectifier.—*Radio Retailing*, January, 1933.

GE Auto Radio

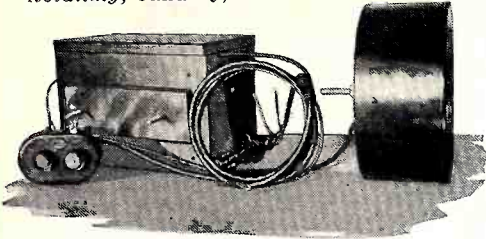
A six-tube superheterodyne all-electric motor car radio can now be obtained from the General Electric Co., Bridgeport, Conn. The new set is a six tube superheterodyne. The dynamotor is of the generator type and has no vibrating parts or tubes.

The chassis, which occupies but small space, is cushioned with felt and rubber, making it vibration-proof. Tubes include three exponential pentodes, a type 85 for a.v.c., and a pentode power amplifier type 89 in the output stage. The electrodynamic speaker is equipped with a tone equalizer. The compact size of the set and the minimum amount of time and labor required for installation make this outfit easily removable to a new car if desired.—*Radio Retailing*, January, 1933.



Auto-Dial Auto Radio

A radio set for automobiles, motor boats or airplanes can be obtained from the J-M-P Mfg. Co., Inc., Milwaukee, Wis. It is designed for either B battery or B eliminator operation. The set uses a 47 power output tube, two 224's, a 235, and a 227. This receiver can be easily attached, only two holes being required for bolting the set to the car. A wood template is furnished. The speaker is a full dynamic. All power connections to the set are made by two plugs, which can easily be disconnected. The dynamic speaker uses one of these plugs, and if desired, it can be removed and another speaker with a similar plug inserted and extended any distance from the car. The price is \$40.—*Radio Retailing*, January, 1933.



Magnavox Auto Speakers

Magnavox Co., Ltd., Ft. Wayne, Ind., is in production on a six inch permanent-magnet dynamic speaker, Model 250, especially adapted for automobile use because there is no drain on the battery. These speakers are especially desirable for police cars that cruise along without battery attention. The list price is \$12.50.—*Radio Retailing*, January, 1933.

Audiola Motor Car Set

A 7-tube all-electric self-contained superheterodyne auto radio has been added to the line of the Audiola Radio Co., 430 S. Green St., Chicago.

The tube line-up includes two 39's, and one each of the 36, 37, 85, 89, and 8R rectifier types. The speaker is a Jensen full size dynamic and the set has steering column remote control. Accessories included are 6 spark-plug suppressors, one distributor suppressor and a generator condenser. The Elkonode power supply is incorporated within the set. Price complete with accessories and tubes is \$74.95.—*Radio Retailing*, January, 1933.

Freed Auto-Radio

An automobile set is being added to the line of the Freed Television and Radio Corp., 22-17 41st Ave., Long Island City, N. Y. It is a 6 tube superheterodyne model will full a.v.c. and dynamic speaker. Power supply is a small motor generator.

Speaker, radio chassis and motor generator are all built into one unit, simplifying installation problems. Remote control fastens to the steering column. Tubes used: 2-39, 1-36, 1-85, 1-89 and 1-79.—*Radio Retailing*, January, 1933.

column. This set has a.v.c. Made for use with B batteries or eliminator in either police or private cars.

Model 33 has five tubes with full a.v.c. It uses a special detector tube and circuit and has dynamic speaker.

Model 41 takes 5 tubes in a t.r.f. circuit. Made for police work.

Model 42 is a 6-tube t.r.f. receiver designed for installation in police scout or cruising cars. B battery or eliminator operation. Special attention has been given this set to make it adaptable to the needs of police work.

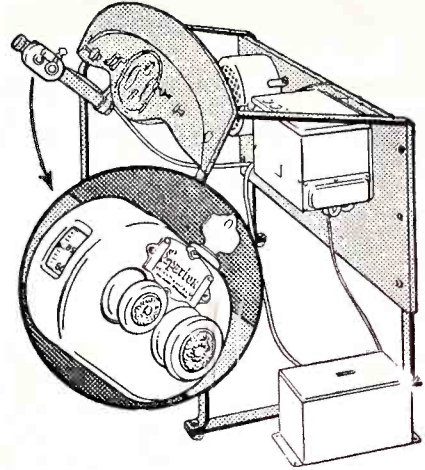
A police desk set, Model 56 (7-tube superhet) is designed to receive shortwave broadcast between 1,500 and 3,600 kc.

Sparton also makes a "police stop light" of chrome or nickel plate. It is made for mounting near the headlights.—*Radio Retailing*, January, 1933.

Sparton Automobile Radios

Sets both for private and police car use are made by the Sparks-Withington Co., Jackson, Mich.

Model 34 is a 7-tube superhet taking 2-39's, 2-38's and one each of the 36, 37 and 70 types. The control unit, with illuminated dial, is mounted on the steering



OTHER NEW MERCHANDISE



Sentinel AC-DC Superhet Midget

A five-tube portable receiver using the superheterodyne circuit, dynamic speaker and operating on a.c. or d.c. of any frequency has been announced by the Sentinel Radio Corp. (successors to the Radio Div. of the United Air Cleaner Corp.), 9705 Cottage Grove Ave., Chicago.

This set, listing at \$22.50 complete, measures 10 in. wide by 7 in. high by 4½ in. deep. Weight, 7½ lb. Easily carried in a small suitcase or in the special zipper carrying case which may be obtained at a nominal price. All surfaces of the cabinet are embossed leatherette finished in soft colors and the body material is wood especially selected for acoustical properties.

Different models will use a wide range of colors so the set will be ideal for living room, kitchen, bedroom, etc. A deluxe model will be supplied in an all-wood cabinet of unusual cabinet design.—*Radio Retailing*, January, 1933.

ABC Washers

Two new washers will be announced this month by the Altorfer Bros. Co., Peoria, Ill.

They are the Imperial Model 16 and Model 66. The former will retail at \$50 and the latter, unusual in design and operation, is \$100.—*Radio Retailing*, January, 1933.

Philco Lazy-X and Other New Sets

New and different is the Lazy-X model of the Philco Radio and Television Co., Philadelphia, Pa. It has remote control housed in a cabinet similar to the Lazy Boy model, designed to be placed next an easy chair or davenport. The controls are under a hinged lid. The sounding cabinet is an attractive piece of furniture with the inclined sound board. The only connection is a single flat tape.

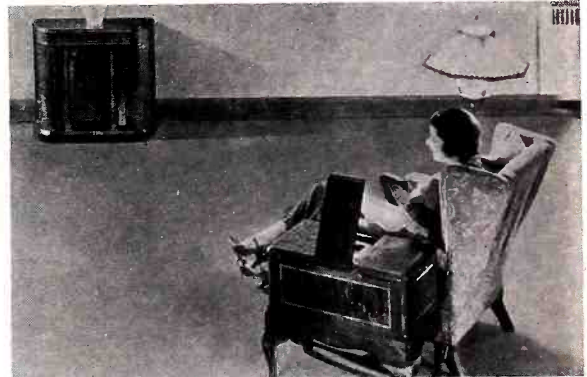
Remote control is achieved by purely electrical means. Not a moving part has been added. Tuning, regulating volume, adjusting tone, all can be done without leaving the chair.

Lazy-X comes in two models—14LZX priced at \$150 and a slightly smaller Model 19LZ priced at \$100.

There is also a model 19-LZ using the same chairside table but the speaker is mounted inside the table. \$65.

Another X type receiver is the Model 71X with the slanting sounding-board front and shadow tuning. This model uses the new tubes and has a list price of \$80.

Philco now makes two d.c. models in cabinets similar to the 52C and 52L. Model



One of the Lazy X Radios in Philco's "Convenience Line"

48C is \$35 and 48L is \$50.

Philco's new a.c. portable is also ready. Carrying the model number 80P, this set lists for \$25. It contains the same chassis as the 80B and is housed in a brown leather finished case with handle. 11½ in. x 9½ in. x 11½ in. When cover is closed, a switch automatically shuts off the radio.—*Radio Retailing*, January, 1933.

Antenex

M. M. Fleron & Son, Inc., 113 N. Broad St., Trenton, N. J., is now making the "Antenex" indoor aerial. It is said to reduce static, noise and interference and is connected to a ground. \$1.—*Radio Retailing*, January, 1933.



L & L Tube Tester

To test four, five, six and seven prong tubes, (no adapter required) the L & L Electric Co., 336 Madison Ave., Memphis, Tenn., has placed on the market its Model E-33 tube tester. It tests the new 56-57-58's, Wunderlich, etc., as well as numerous other types including Sparton and Kellogg new and old models. The following tests can be made; short, grid change, oscillation and total filament emission. The nine sockets and the selector switch offer a range and flexibility of operation. The dealer's net price is \$19.80.—*Radio Retailing*, January, 1933.



Stewart Warner Radio Line

The popularity of the "Magic Dial" has warranted an extension of this line by the Stewart Warner Radio Corp., 1826 Diversey Blvd., Chicago, Ill.

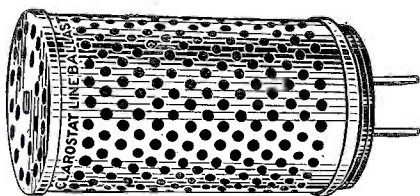
Two all-wave receivers have been introduced, each with the same 11 tube duosuperheterodyne chassis formerly employed. The two consoles are of English period design. Model 55-A is \$119.75 and 56-A is \$129.75.

A new 7-tube superheterodyne circuit has also been designed using three 58's in the r.f., i.f. and first detector stages, a 56 type oscillator; a 58 in the output stage; a 55 double diode triode in the second detector stage, and an 80 rectifier. Inter-Station noise suppressor is incorporated.

Model 63 lowboy is \$68.95. With two electro-dynamic speakers \$74.95. Model 65 is \$83.95 with twin speakers.—*Radio Retailing*, January, 1933.

Replacement Line Ballasts

In order to fill the replacement need for line ballasts now going bad in the numerous sets over two years old, the Clarostat Mfg. Co., 285 N. Sixth St., Brooklyn, N. Y., offers a new ballast replacement item. This service enables dealers and servicers to get the correct type for the set, even where manufacturers have discontinued replacements. A guide book shows exactly the correct type for the receiver.—*Radio Retailing*, January, 1933.



Lynch Short-wave Antenna Blocks

The new improved Lynch transposition blocks offer prevention of moisture accumulation and ease of threading wires. Reduced capacity is attained by the large center hole. These blocks are made of Lynchite which has a power factor higher than glass and is non-hygroscopic with high tensile strength. Lynch Mfg. Co., 1775 Broadway, New York City.—*Radio Retailing*, January, 1933.



Audiola Receivers

New additions to the radio receiver line of the Audiola Radio Co., 430 S. Green St., Chicago, include Model 844, an 8 tube superheterodyne low-boy with a.v.c. and inter-station noise suppressor, \$58.

Model 868, also an 8 tube set with the same features, is \$65 in a highboy.

Model 1068D, the same cabinet, but with

a 10-tube circuit and two dynamic speakers is \$73.

Model 1054, low-boy is also a 10 tube set. This set has one speaker, \$68.

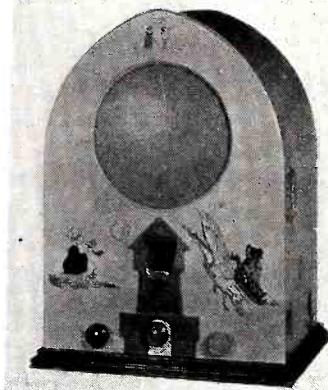
Model 10300D is a 10 tube set with dual Jensen dynamic speakers and all the features of the other sets. The cabinet is a six legged high-boy. \$85.

Model 12300D, a 12 tube superheterodyne with class B amplification in the above console is \$100.—*Radio Retailing*, January, 1933.

RCA Victor-Nursery Radio

A playroom model to give children access to their favorite programs is being made by the RCA Victor Co., Inc., Camden, N. J. It is a 7-tube superheterodyne table model selling for \$49.50.

The cabinet is attractively lacquered in cream and blue, and decorated with brightly colored motifs from the standard nursery tales. The set carries the model number R-70-N.—*Radio Retailing*, January, 1933.



Automatic Combination

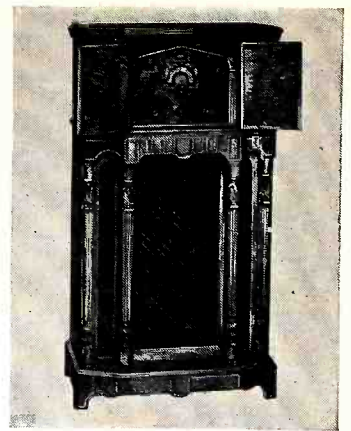
The custom-built Chateau Model 404-A is a new offering of the Capehart Corp., Fort Wayne, Indiana. It takes its place as a member of the DeLuxe 400 series and embodies an automatic record changer which handles from 3 to 22 records, ten and twelve-inch sizes intermixed, playing each record on both sides. The radio is a 14-tube superheterodyne using the new tubes and having a.v.c., noise suppressor and meter tuning.—*Radio Retailing*, January, 1933.



Yaxley Replacement Volume Controls

Yaxley Mfg. Co., Indianapolis, Ind., has developed the new "H" type replacement volume control which is quite different from the conventional type and offers many features for service work. The contact arm is of entirely new construction. By means of this arm the contact pressure is held uniform and definite.

The new "RP" type replacement controls are now made on the "H" type base. They contain a Yaxley built-in a.c. switch. When the switch is not desired, a screw is removed which cuts out the a.c. switch.—*Radio Retailing*, January, 1933.



Clarion Receivers

Six sets have just been put out by the Transformer Corp. of America, Ogden and Keeler Aves., Chicago.

Model 321, Clarion, Jr., is a five-tuber in a Moderne midget cabinet. Superhet circuit; 6 in. speaker. \$19.95 complete.

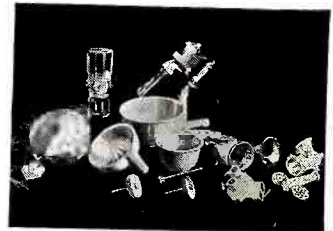
Model 322, same specifications with the exception of the speaker which is 8 in., \$29.95 in a console cabinet.

Models 340 and 341, eight-tube superhets with a.v.c., are priced at \$29.95 and \$39.95. The former is a midget in a Moderne cabinet and the latter is a six-legged console.

Model 360 has the "organ type" cabinet, class B amplification, 10 tubes, a.v.c., power drive stage and 10 in. speaker. \$49.95.

Model 300, the de luxe model of the series, is a 14-tube set in a walnut cabinet of Hepplewhite design. It has class B amplification, tuning indicator, twin 10 in. speakers, delayed a.v.c., continuous variable tone control, automatic selectivity control and variable noise level control. \$89.50.

A replacement chassis with speaker (same chassis as Model 360) and metal panel may be obtained for \$39.95, complete.—*Radio Retailing*, January, 1933.



"Magic Maid" Attachments

In addition to mixer, beater, juice extractor, the Magic Maid of the Fitzgerald Mfg. Co., Torrington, Conn., now provides: coffee roaster, coffee grinder, vegetable slicer, vegetable shredder, silver polisher, knife sharpener and meat grinder. These additional attachments list at from \$.50 to \$4.75 each.—*Radio Retailing*, January, 1933.

Cleanaire Refrigerator Deodorizer

Introduction of the "Cleanaire" solves the problem of eliminating and reducing offensive food odors in refrigerators. It is compact in size and two small clips enable one to hang it on the under side of a shelf out of the way. Gas masks during the war contained some of the same material now used in Cleanaire. This material lasts on an average of three months before replacing is necessary.

The Cleanaire is made by the Ohio Carbon Company, Cleveland, Ohio, and comes attractively packaged in a display carton. Each unit is wrapped in cellophane. List price \$.50.—*Radio Retailing*, January, 1933.



SERVICE SHORTCUTS

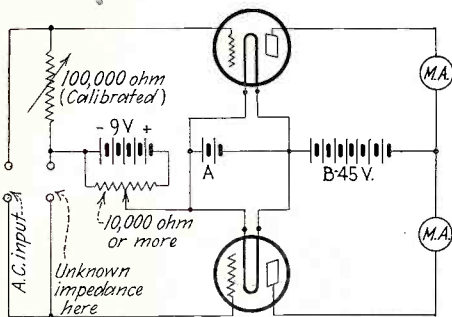


Technical Section of "Radio Retailing"

Impedance-Measuring Instrument

By Morris Chernow

The impedance of transformers and speakers may be quickly measured with the instrument diagrammed. It "weighs" an unknown value against a known value, and,



if required, permits impedance to be plotted against frequency.

The two tubes function as v.t. voltmeters. The 100,000 variable resistance, which should be calibrated, connects across the input of one tube and the unknown impedance is connected across the input of the other. An a.c. signal, which may conveniently come from a calibrated oscillator, is simultaneously applied across both the known and the unknown resistances. By varying the calibrated resistance until the same input voltage is applied to both tubes the plate currents, indicated by separate milliammeters, may be made to balance. When this condition is reached the unknown resistance equals the resistance of the calibrated resistance.

The calibrated resistor should be a good, non-inductive type. The potentiometer need not be an expensive type. Care should be taken that impedances are measured near the frequency at which they will normally operate.

Cure for Flickering Pilots

By W. T. Golson

Dial lights, especially those used in automotive sets, have a nasty habit of

jiggling loose in their sockets. Wind a rubber-band tightly around them and then around the socket to stop flickering.

Another method is to squeeze the socket slightly with pliers, just enough to make the bulb turn down hard.

Tube Short-Tester

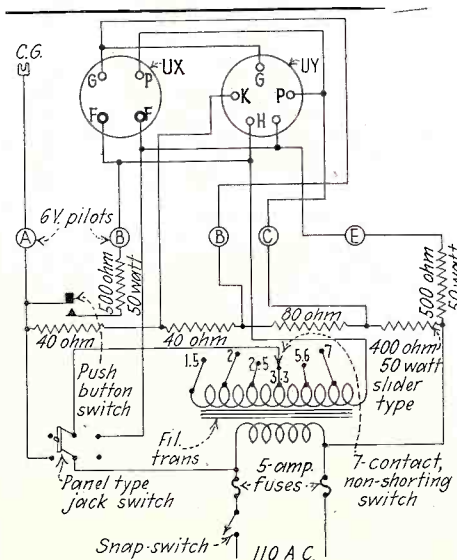
By Joseph E. Soos

I have built a tube short-tester which is superior to most devices of this kind in that the filaments of the tubes under test are lighted. Instruments which check tubes when "cold" fail where elements do not touch until heat causes expansion.

Lighting of the pilot lamps indicates inter-element shorts of the following variety:

- AControl grid—cathode
- BControl or screen grid—cathode
- CPlate—cathode
- BE.....Heater or filament—control or screen grid
- CE.....Heater or filament—plate

The indicating lamps are mounted in Christmas-tree miniature sockets and may, of course, be lacquered different colors for easy reading.



Cars With Antenna

Check-up among leading automobile makers indicates that many new cars are antenna-equipped. Here's a list of those that do and don't:

Auburn	No
Buick	No
Cadillac	Yes
Chevrolet	Yes
Cord	No
DeSoto	Yes
Dodge	Yes
Essex	No
Ford	No
Franklin	Yes
Graham	No
Hudson	No
LaSalle	Yes
Marmon	No
Nash	Yes
Packard	No
Pierce-Arrow	Yes
Plymouth	Yes
Pontiac	No
Rockne	Yes
Studebaker	Yes
Stutz	Yes
Willys	No

New Tubes for Old

By J. P. Kennedy

The volume of four-tube midgets, particularly of the 1932 variety, may often be snapped up by the substitution of the new 50-series tubes for older 27's, 24's, 35's and 51's. Using six-hole wafer sockets with the suppressor tied to the cathode a considerable increase in volume is obtained when substituting a 57, for example, for a 24 detector and a moderate increase when substituting one for a 24 r.f. tube.

There is a tendency of r.f. stages to oscillate after such changes in certain models but this may be eliminated by including a 750 ohm, 1/4 watt carbon resistor

(Please turn to page 37)

Noise Elimination in Auto-Radio Installations

How to reduce interference from the ignition system, other electrical devices in the car and from non-electrical sources

By C. G. SERIGHT

IT WOULD be a reasonably conservative assertion to state that not one automobile radio installation in five is all that might be desired as regards freedom from interference due to causes within the car itself. The purpose of this article shall be to point out ways and means whereby those undesirable interferences can be reduced.

The first step consists in ascertaining the exact nature of the interference that is to be eliminated. It is impossible to eliminate, or even reduce, outside interference due to overhead wires, static, etc., so it may be excluded from any further consideration. Other interferences fall naturally into three main classes:

1. Interference from the ignition system.
2. Interferences from other electrical devices in the car.
3. Interferences from non-electrical sources in the car.

How Ignition Systems Work

Interference from the ignition system claims first consideration as it is universal to all gas-engines and is as well usually the hardest to reduce. Interference from non-electrical sources also is sometimes quite bothersome, whereas that of Class Two rarely give serious trouble.

The ignition system is composed of two circuits, the primary or battery circuit, and the secondary or high-tension circuit. The primary circuit includes the storage battery, ignition-coil primary, breaker-points of the distributor, by-pass condenser across same, and the attendant wiring and return circuit through ground (motor block and car frame), as indicated by the light lines in Figure 1. The secondary circuit is composed of the ignition coil secondary, distributor, spark plugs and leads, and the return circuit through ground and the primary circuit wiring, as indicated by the heavy lines in Figure 1.

During the period of time when the breaker points are closed, it will be seen by reference to Figure 1 that the condenser across the points will remain discharged (being short-circuited, and that the storage battery will send a current through the coil primary, charging its core with magnetic flux. A cam which is geared to the engine opens the breaker-points at the proper instant, and

since the battery voltage is thereby disconnected from the coil, the magnetizing force acting on its core is removed, and the magnetic energy stored in the core reverts to electrical energy, establishing a train of damped "oscillations" in the primary circuit. But the values of inductance and capacity comprising this oscillatory circuit preclude any notion of the generation in it of frequencies high enough to cause radio interference in the broadcast spectrum. We must obviously look to the secondary circuit for the cause of the radio interference.

"Grief" is in Secondary

The secondary winding of the ignition coil consists of some thousands of turns of fine wire, and being closely coupled to the core it has a very high voltage induced in it by the sudden reduction of the magnetic flux in the core occurring upon the opening of the breaker-points. This high voltage is transferred to the correct spark plug by the high tension cables through the selective action of the rotating arm in the top of the distributor. At the instant when the voltage across the plug-points attains a sufficiently high value (probably in the neighborhood of 15,000 volts), the gas mixture between the plug points ionizes (a spark forms), and the path between the plug points instantaneously becomes conducting. A current of a few milliamperes is almost instantly established through the spark plug and as the high-tension cables have some reactance and the ignition coil has very poor voltage regulation, there is a concurrent practically instantaneous drop in voltage across the plug. It is important to note that this change in potential across the spark plug, amounting to sev-

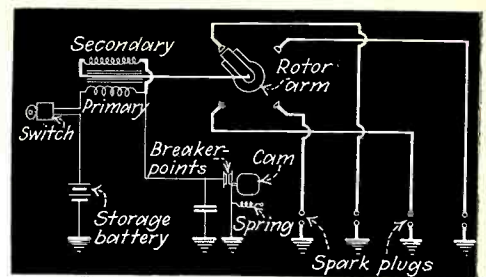


Fig. 1—Simple ignition circuit. High-frequency disturbance is present in the secondary (heavy lines) and some passes to the primary circuit (light lines) via the common portion of the wiring and the capacity between the coil windings

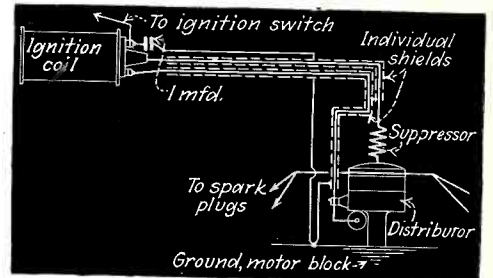


Fig. 2—Suggested coil-to-distributor cabling. If primary and secondary leads are shielded from each other but run side by side high-frequency disturbances leaving the coil and returning to it will usually "cancel" out

eral thousands of volts, occurs in the incredibly brief space of time when the spark is forming between the plug points.

Effects of Spark

The disturbance so generated travels along the high-tension cables and its energy is dissipated in several ways. Part of this energy is utilized in setting up on the high-tension cables a highly-damped train of oscillations of extremely high frequency, the frequency being determined by the resistance of the spark, and the inductance and capacity of that portion of the high-tension cables through which current is flowing at the time. Part of the energy of these oscillations is in turn converted into radiated waves, similar in every respect to those produced by a high frequency spark transmitter. Relatively more important, another portion of the energy of the transient is converted into induction and electromagnetic radiation waves; waves of a nature to excite by shock the tuned circuits of a radio set installed in the car.

There is also a gap in the distributor which must be bridged by a spark, and at that point likewise there are also generated waves in the manner and of the nature just described.

This type of interference manifests itself by a "ticking" sound in the speaker each time a plug fires, although the intensity of the disturbances may vary considerably from cylinder to cylinder.

Other conditions being equal, the least interference will be suffered from the high-tension circuits when the distributor is located at the front of the motor, near the radiator, and the most when the distributor is located at the rear of the motor, near the dash, due to

the fact that the intensity of the interference waves decreases rapidly as the distance from the radiating device increases because of the spreading of the wave energy through a greater amount of space, just as a transmitter's signals fall in intensity with increasing distance from the transmitting antenna.

Quieting Battery Circuits

The primary circuit, as indicated above, generates very little interference on its own account, but it frequently feeds high-tension interference into other wiring about the car. Of course there is some little sparking at the breaker-points, but a condenser, necessary to the proper functioning of the ignition system, is already provided across them, which effectually stops radiation from that source. Some interference from the high-tension circuit gets into the primary circuit via the common portion of the wiring of the two circuits and the capacity between the windings of the ignition coil; this can be minimized by the use of a 1 mfd. condenser from the battery side of the coil primary to ground. Occasionally an additional 1 mfd. condenser from the ammeter or some other point in the car wiring to ground will make a noticeable further reduction in the ignition interference.

It is important that interference currents be kept out of the car wiring and lighting circuits to as great an extent as possible, and to this end the leads connected to the ignition coil should be carefully isolated with respect to all other wiring. If these wires are cabled with others going to the lights and elsewhere, new ones must usually be substituted following a different course.

The primary and secondary wires from the coil to the distributor should be shielded from each other, but are preferably run side by side, and with these should be run the grounding lead for the by-pass condenser on the battery side of the ignition coil, which should be grounded to the motor block. The theory behind this arrangement, which is illustrated in Figure 2, is that the sum of the high-tension currents leaving the coil and returning to the coil is zero, and as these three leads carry practically all of the high-tension current their electro-magnetic induction effects on other wiring will cancel if they are bunched closely together.

Ground-Point Selection

Installation instructions almost invariably read, in substance, "Be sure that the set and speaker are well grounded to the dash" I, personally, believe that is usually the wrong thing to do for there are high-frequency interference currents set up in the metal panels of the car body by radiation and induction from high-tension circuits. These currents are especially strong near and around the engine and they give rise to appreciable differences in potential between points that are all supposedly at "ground" potential. If the set is grounded at random to the dash some portion of these voltages is almost certain to be included in the antenna circuit and so will actuate the set. A typical installation, in which this has not been taken into consideration, is shown

in Figure 3-A at the bottom of the page.

The set, speaker, and control units should, in my estimation, be insulated from the body of the car and the entire system grounded at some "best" point only, this being determined by experiment. By selecting some neutral point at which to ground the set, the interference from the ignition system can frequently be reduced by a ratio of as much as four or five to one. The filament leads from the set should usually be run directly to the storage battery, rather than to the ammeter or elsewhere, as there is less likelihood of picking up interference at that point. Such an installation is shown in Figure 3-B.

How "Suppressors" Work

And now let us take up the treatment of the high-tension circuits. First, of course, the suppressors are installed, one at each spark plug and one in the main high-tension lead at the distributor end. They should be of a long, slender type having low surface leakage and low distributed capacity. In many cases the use of suppressors will reduce the high-tension interference to the point where its intensity does not compel the additional expense of shielding.

The accepted theory of suppressor operation is that they add sufficient damping to the high-tension circuits to prevent those circuits from oscillating at their own natural frequency. In addition, the suppressors limit the rise in current through the high-tension circuit and so narrow the induction field around the high-tension cables. Further, they assume part of the change in potential that occurs across the spark plug when its gap is spanned by the spark, thus limiting the voltage change along the high-tension cables and so reducing the strength of the radiation field thrown off by the high-tension circuit. There is reason to believe that the last described function of the suppressor completely outweighs in importance the first two given; reason, indeed, to suspect that the first mentioned effect of the suppressor

Some "Gems" from the Text . . .

- "Gear" noise, loudest when free-wheeling and present even with the ignition off, can be reduced by bonding the transmission and rear-end housings together
- The cutout winding may be utilized for its choking effect, in conjunction with condensers, when filtering out generator noise
- Sheet-iron .040 inches thick makes good, cheap shielding
- If filament leads can be carried directly to the storage battery there is less likelihood of noise pickup
- A 1. mfd. condenser from the battery-side of the ignition coil primary to ground minimizes passage of high-tension interference to the battery circuit through the capacity between windings

is actually detrimental, in that, given the same original amplitude, the more highly damped the oscillations are which it is intended to suppress, the more readily will they excite a tuned circuit of a radio set.

The value of suppressing resistance that may be used is limited to about 25,000 ohms by its effect on the spark, which can not be weakened to any great extent without impairing the efficiency of the engine.

Shielding Must Be Complete

If the use of suppressors, plus the precautionary measures described, does not secure a satisfactory diminution of the ignition interference, the only thing

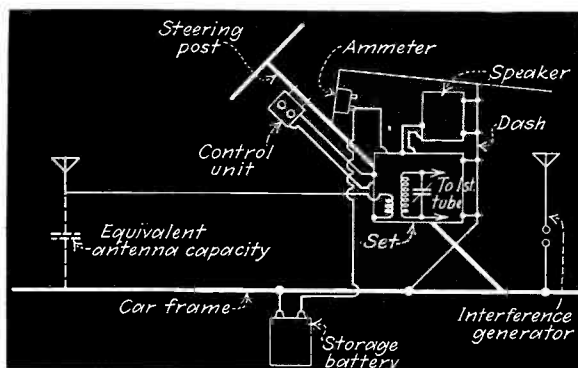
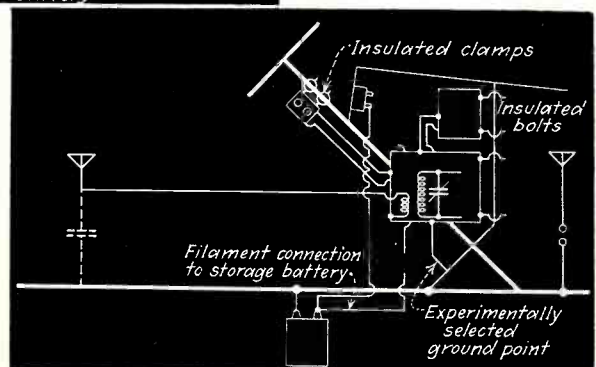
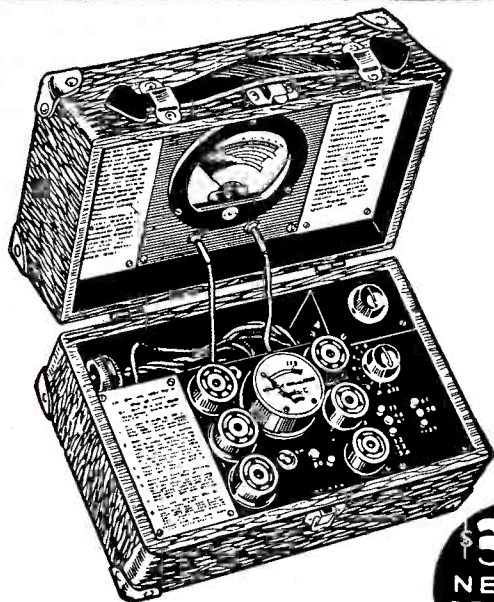


Fig. 3A—Common installation, in which both chassis and control unit are grounded. Interference currents set up in metal panels, differences of potential between points supposedly neutral, sometimes introduce noise into the antenna system

Fig. 3B—Recommended installation, in which interference currents set up in metal panels are kept from influencing the receiver by the use of insulating clamps and direct filament connection to the battery



A More Profitable Tester for Dealers!



Readrite Tester No. 443

\$33.00
NET TO DEALERS
List. \$55.00

NOW you can test tubes over the counter and out of the set quicker and more economically than ever before. Why pay more for a high grade tester than \$33.00 (the net price to dealers)? Send the coupon today for additional facts. See for yourself the reasons why dealers prefer this tester. Besides being lower in price, it accepts or rejects tubes as effectively as testers costing many times its low price.

A Remarkable Instrument At a Remarkable Price!

This new counter and portable tube tester has six colored scales . . . for testing conductance of good, doubtful and poor tubes. It tests all the new tubes. It is equipped with a line voltmeter and regulator. A large precision meter, in the cover, is placed at a right angle for counter use. A handy chart, besides the meter, contains a scale reference for every tube.

If your jobber cannot supply you, we will ship the No. 443 Readrite Tester directly to you—when remittance accompanies your order at dealer's net price of \$33.00.

Readrite Meter Works
41 College Ave., Bluffton, Ohio

MAIL COUPON NOW

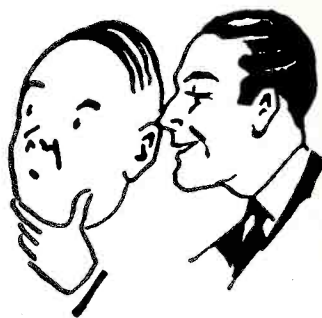
READRITE METER WORKS
41 College Ave., Bluffton, Ohio

Gentlemen:
Please send me information about Readrite No. 443 Counter Tube Tester. Also catalog of other servicing instruments.

Name

Street Address

City State



TAKE A TIP from

A 1932 Winner for 1933 Success

WITH 1933 here—everybody's offering advice—but fortunately there are no "I told you so" fellows because everyone knew what to expect of '32.

However, our record for 1932 speaks for itself and for every dealer and jobber handling OHIOHMS. We made money in '32. Together with our customers we've got greater prospects in view for this year. If you haven't been in on OHIOHM merchandising-success, let's give you the story now. A tailor-made plan for every type and class of radio tradesman.



- FIRST-AID Resistor Kits.
- Dealer Resistor Server.
- Jobber Metal Cabinets.
- Spark Suppressor Sets for eliminating ignition interference on auto radios.

OHIOHM RESISTORS

THE OHIO CARBON COMPANY, Cleveland, Ohio
Ohiohm Resistors are made in Canada by
C. C. Meredith & Co., Ltd., 67 Bay Street, Toronto

SOMETHING NEW!

CLEANAIRE ICE BOX AND REFRIGERATOR DEODORIZER

Absorbs and destroys food odors. Stops tainted foods. Add it to your line.

left to do that is certain to effect an improvement is to completely shield the high-tension circuits including the distributor, suppressors, spark plugs, and all high-tension wiring. The use of shielded high-tension cables only is rarely of enough benefit to warrant the expense, for the suppressors, plug ends, and distributor cap which are so left exposed constitute quite an appreciable portion of the interference radiating surface.

Shielding should be so designed and constructed as to permit of its easy removal and reinstallation in case repairs or adjustments must be made to the engine or ignition system, and due care should be taken to eliminate the possibility of shorting out all or part of the ignition system; at least $\frac{3}{4}$ of an inch of clearance should be allowed over all exposed metal parts in the high-tension circuits. Sheet copper makes excellent shielding because of its high conductivity, but sheet iron of about .040 in. thickness will be found sufficiently effective for all ordinary installations besides being much more economical and having greater mechanical strength.

Coil, "Rotor", Plugs

Occasionally it will be found desirable to move the ignition coil. The nearer to the distributor it can be placed the better, for the main lead from the coil to the distributor carries all the high voltage impulses and a short lead will reduce the chances of radiation at that point. If it is found necessary to mount the coil over the motor, care should be taken that it is so mounted as to stay sufficiently cool.

Those engaged in installing and servicing automobile radios will have noticed that when a set is installed in a new car the ignition interference tends to grow worse as the miles mount on the speedometer. The explanation of this phenomenon is that the gaps in the plugs and distributor slowly burn wider, and continuously higher voltages are required to produce the sparks which bridge those gaps.

It is a relatively simple matter to adjust the spark plug points to compensate for the metal that is burned away, but effectively closing the distributor gap is a more difficult feat. Building up the rotor arm with solder is not to be recommended, as the solder very soon burns away. The rotor electrode may also be lengthened by hammering, but this process must be conducted with a degree of caution and nicety. It is generally best, and not very costly, to substitute a new rotor.

Generator, Accessories

After the noise from the ignition system has been eliminated it is necessary to make a careful check-over for other sources of extraneous noises. Those coming under Class Two (Interference from other Electrical Devices) will be considered next. The set should be operated with the volume turned to maximum and should not be tuned to a station. Any attachments or accessories such as electric windshield wipers and heater motors should be turned on and checked for interference. A 1 mfd. condenser across these motors, mounted on the motors, will greatly eliminate any interference that they create. The car

generator also emits interference, partly due to sparking on its commutator, which is distinguished by a characteristic whine, increasing in pitch as the engine speed is increased. A 1 mfd. condenser on each side of the cut-out relay will entirely eliminate this interference in practically all cases and usually only one will be required. These condensers should be mounted and grounded by the screws that hold the cut-out to the generator frame. The reactance of the cut-out winding is taken advantage of for its choking effect.

Condensers used for the purpose of filtering out interferences should be non-inductive in construction and should have the lowest possible R.F. resistance. Electrolytic types are not suitable.

Non-Electrical Noise Sources

There still remain to be considered the interferences emanating from what are, at least to all outward appearances, non-electrical sources (Class Three). Such interferences put in an appearance only when the car is in motion and for that reason are frequently attributed to causes outside the car. They are more pronounced at high speeds and on rough roads.

A little care in the installation of the set will forestall one group of quite obnoxious interferences of this class. If the battery, speaker, and control unit cables are enclosed in metal shielding, as they usually are, they should be well insulated wherever there is any likelihood of them coming in contact with any other metal part of the set or car. Any metal parts about the set making imperfect or intermittent contact with each other will cause noise in the speaker when the car is subjected to a jolt, whether there is any measurable potential difference between those parts or not. This interference is due to the instantaneous change in the resistance of the set to ground that occurs when another grounded conductor touches or is disconnected from the set.

To preclude the possibility of such noises in the automotive installation, choke wires, speedometer cable, copper tubes, battery cables and the like should not be allowed to rub on the speaker or set cases. If the set is hung on hooks or a previously mounted bracket, it should be so suspended that there will be no possibility of the contact resistance to ground changing.

Spotting "Gear" Noise

Another type of interference coming under Class Three that is encountered in all makes of cars may be serious when the antenna is located underneath the car. This noise is of two kinds, often heard concurrently. One consists simply of more or less disconnected plops, which usually may be associated with irregularities in the road. The other is a steady rasping sound, the period of which is governed by the car speed. It somewhat resembles the interference from a trolley line or is suggestive of ill-fitting gears or of a slowly running brush motor, and gets louder with increasing car speed, being loudest when the car is coasting or free-wheeling. That these noises are independent of interferences emanating from the electrical system of the car is proved by the fact that

all electrical devices in the car including the ignition may be shut off without in any way affecting their nature or intensity.

This interference is due to the driving elements of the car making poor and variable contact with each other and with the frame and body of the car, the action of the springs, the back-lash in the gears, etc., allowing them to break contact momentarily or change contact resistance, which results in a change in the characteristics of the antenna system. Thus, if the drive shaft of the car is in the field of the antenna and the contact resistance of its connection to either the transmission or rear system changes, a voltage will be induced in the antenna circuit and may excite the tuned input circuit of the radio set.

When the engine is pulling the car, or when the car is pushing the engine, the drive system is in a state of stress that maintains its various units in more nearly perfect electrical contact, accounting for the interference being less than when the car is free-wheeling or when the clutch is disengaged.

Bonding Helps

It is utterly impossible entirely to eliminate interferences generated in the manner just described, by any means at the disposal of the radio service man or mechanic; probably these interferences will never be entirely eliminated. The best solution for troubles of the kind seems to be to change the antenna to the top of the car where it will be more nearly out of the sphere of influence of disturbances created by the drive system.

If it is not found possible to put the antenna in the top of the car, the next best remedy is to bond the transmission and rear-end system to each other and to the frame of the car with heavy, flexible conductors such as braided copper tape or tubing, the idea being to connect the offending units so closely together electrically that the changes in contact resistance between them will be rendered unimportant.

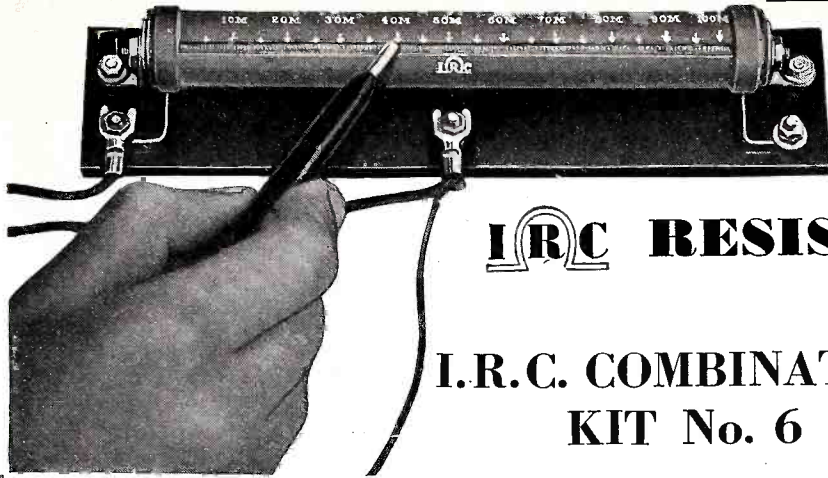
Loose brake rods and similar appurtenances are other sources of interferences of this type, the noises caused by these appendages being of the kind described first above, i.e., that which is associated with irregularities in the road surface. Once the seat of trouble is located, these more minor interferences will ordinarily be fairly easy to eliminate by bonding the offending unit to the frame of the car at the points of intermittent contact.

Locating Open Condensers

By Harry Pike

Two test prods connected in series with a 1. mfd., high-voltage condenser are particularly handy in locating open condensers in a circuit. Merely touch the prods to units suspected and replace these if reception is improved. The 1. mfd. size is common enough to work in most positions well enough for testing.

A resistor-open tester may be made on the same principle. A high value of resistance should naturally be used to avoid trouble.



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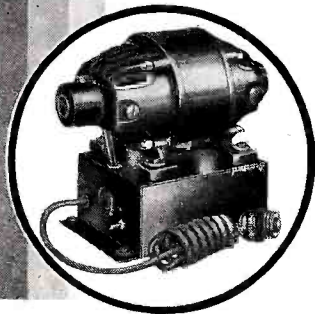
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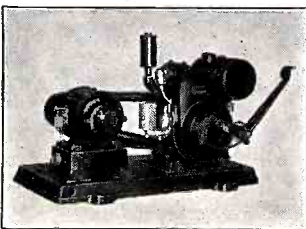
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SERVICE SHORTCUTS

(Continued from page 31)

in the grid circuit. This may be easily accomplished by unsoldering the grid clip and including the resistor between grid wire and clip. Most of the old shields are quite satisfactory. The type 58, when substituted for type 35 or 51 detectors in superheterodynes produces a marked increase in volume. The gain in r.f. and i.f. stages, on the other hand, is noticeable only on an output meter. Trimmers should of course be re-adjusted when substituting new tubes for old.

Sets using 24 r.f. amplifiers and 27 detectors do not respond with audible gain when 57's and 58's are substituted for 24's. They can be improved, however, by the substitution of a 56 for the 27, both tone and volume responding.

For Rattling Voice-Coils

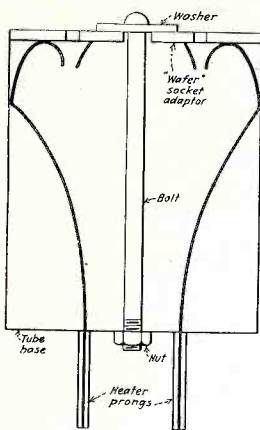
By Frank L. Bowers

Dynamic speaker cones sometimes develop rattles which re-centering does not cure. Remove cone. Wipe hot glue all over the voice-coil, removing excess. Apply hot glue also to all cone joints. Let the speaker stand until dry. This cures free vibration.

Simple Pre-Heater

By J. Richard Kearns

An adaptor constructed along the lines



shown in the illustration, of a discarded tube base, a "wafer" type adaptor socket and a long bolt, makes an excellent portable pre-heater. Connect the two heater terminals of the wafer socket to the heater prongs of the tube base. When testing tubes on a job with an analyzer plug the adaptor in one of the sockets of the set and heat up tubes while others are being tested.

Auto-Radio Battery Box

By Boris S. Naimark

Don't throw away old Philco socket power cases. These measure 8 by 11 $\frac{1}{8}$ by

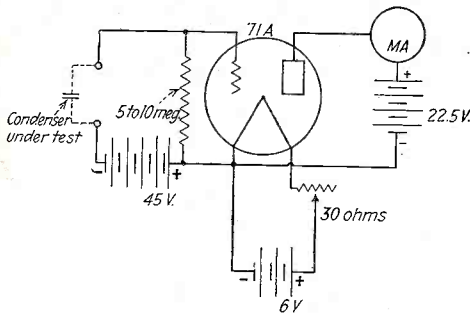
13 $\frac{1}{8}$ inches and make excellent battery boxes for auto-radio installations. Four heavy-duty B's easily slip into them.

Low-Capacity Condenser Tester

By Elmer Schulz

I have constructed a simple device which quickly tests condensers up to .0005 mfd. for open circuit and leakage. It is particularly valuable in damp climates and for checking shortwave receivers.

The construction of the tester is shown in the accompanying diagram. It is im-



portant to use a gridleak of at least 5 megohms resistance. A milliammeter having a 10 ma., or 25 ma. scale is suitable and I use the filament voltmeter from an old RCA superheterodyne with the series resistor removed. A 4.5 volt C battery may be used to light the 71A filament. It is important to use well insulated, dry test leads.

Adjust the filament rheostat so that some convenient deflection is obtained on the meter. Test the instrument by touching the test-prods together. The high negative bias should cut plate current to zero. Now, connect the condenser to be tested and note the action of the meter-needle. It should "kick" toward zero and then return to within 85 per cent of the original deflection. The amount of kick is dependent upon the capacity of the condenser.

If it is open-circuited no kick will be obtained. If it is leaky the needle will not return to its original position and if the condenser resistance is very low the needle will go to zero and remain there. Do not try to check condensers larger than .0005 mfd. as the needle will not return to its original deflection or anywhere near it. A .05 mfd. capacity, for example, produces only a 30 per cent reading.

We PAY for These

RADIO RETAILING pays regular space rates for acceptable letters from experienced servicemen describing original repairing methods or equipment.

Items appearing on this page are good examples of the type of material desired. Schematic diagrams and drawings need not be artistic, merely clear.

Mail SHORTCUTS to W. MacDonald, Technical Editor, RADIO RETAILING, 330 West 42d Street, New York City.

TRICKS of the TRADE

RCA 48. Cutting in and out of reception is sometimes caused by sluffing off of the plating on tuning condensers. Hum, noticeable only when records are played, is cured by a 5,000 ohm resistor shunted across the secondary of the pickup input transformer.

MONTGOMERY-WARD 62-11, 12. Lack of sensitivity may be corrected by removing the filter choke and 25 mfd. shunt condenser entirely from the circuit, then removing the second dry-electrolytic filter condenser and replacing this with a 4 mfd., 450 volt type.

PHILCO. Where dial cables show a tendency to slip at several points smear the cable with rosin.

CROSLY 40S. When tone is bad, pep lacking and an analyzer check shows positive bias on the first audio tube, replace the by-pass condenser connected between the detector and the first audio grid.

AK 37, 38, 40, 42. Use of a 1 mfd., 400 volt condenser between the filament of the 280 where it connects to the first choke and ground increases pep and reduces hum. Try it next time it is necessary to rip open one of the cans.

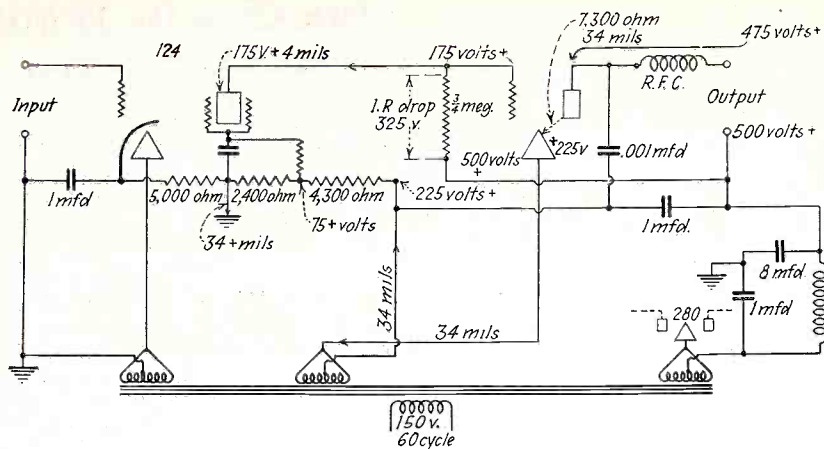
EDISON, SPLITDORF. When double-section carbon volume controls connected across two plate coils fail a good replacement repair can be made by grounding the center arm of a 10,000 ohm, variable-taper potentiometer, connecting the off-side point to the antenna post through a shielded lead and the on-side point to the end of the 600 ohm bias resistance on the 226's which formerly went direct to ground. The leads to the plate coils from the original controls could be cut off and taped. Then the regeneration switch control should be converted into a local-distance switch, throwing a .003 condenser across antenna and ground to provide control on loud locals.

GE, RCA. In avc equipped models locals sometimes snap in and out as they are tuned-through. Substitute a new 35 for those in RF and IF stages until the trouble is found.

AMRAD 81. If hum develops after about 30 minutes of operation replace the two 18 mfd. electrolytic sections with paper condensers. The breakdown rating need not be high as this circuit feeds only screens and the detector plate. Reforming the electrolytic rarely gives permanent results as the voltage is not high enough to keep it active.

AK 37 to 60. When dial belts are not obtainable use heavy dial cable. Anchor to pulley-pins, spot with drop of solder. Move condenser to take up slack.

(More SHORTCUTS on page 38)



Servicing Direct-Coupled Amplifiers

By Boris S. Naimark

Direct-coupled amplifiers are not clearly understood by many servicemen. In order to clarify servicing of the system I have calculated approximate voltages and currents appearing at various points in a typical circuit. This makes possible an explanation which, I hope, will be helpful.

To begin with I calculated that the d.c. plate to filament resistance of the 45 tube is approximately 7,300 ohms. I have assumed the over-all voltage from B-plus maximum to ground to be 500 volts. The plate current of the 24 tube is approximately 4 milliamperes.

Carefully studying the accompanying diagram we see that 175 volts positive is applied to the plate of the 24. The same positive voltage is applied to the grid of the 45. This seems puzzling until we discover that the filament of the 45 is actually 225 volts above the ground so that with reference to its filament the grid of the 45 is actually 50 volts negative, while its plate voltage, with reference to the same point, is 250 volts positive. Thus despite the seemingly incongruous fact that a high positive voltage is applied to the grid of the power tube the latter actually operates at standard recommended operating potentials.

The important point of distinction to remember is that the grid bias of the output (45) tube is a function of the plate current of the input (24) tube.

Thus a low emission '24 tube results in a lowered current flow through the 1/2 meg. coupling resistor—the IR drop is thus reduced—a higher positive voltage is applied to the grid of the '45 so that when this positive voltage reaches a value of 225 volts the power tube, in effect, has its grid bias removed just as effectively as if the 1/2 meg. coupling resistor were open or removed.

The same condition will obtain when the screen-grid series resistor (1/2 meg.) is open because this causes the plate current of the '24 to drop to an exceedingly low value, effectively removing the grid bias from the power tube or even making the grid of that tube positive with respect to its own filament.

Remembering the above circuit conditions we are ready to shoot trouble in the direct coupled amplifier.

First—test all tubes. Second—measure the plate current of the output ('45) tube; this should be approximately 34 mils. and a correct value denotes that all the re-

sistors in the network are O.K.; if too low or high a value is obtained check all resistors for both continuity and ohmic value.

Last, but not least, check the power supply and filter circuits. These tests, being no different from tests in any power amplifier unit, need not be gone into here.

Operating On 230 A.C.

By M. H. Dover

The other day I received an order for a set to be worked on 230 volts a.c. It had to be delivered immediately. I mounted a lamp socket in series with the a.c. leads of a 110-volt receiver, placed a lamp requiring exactly the same wattage as the set in the socket and made the delivery.

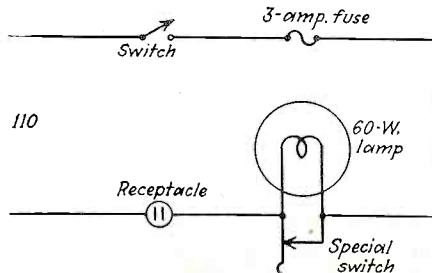
It worked fine.

Soldering Iron Saver

By R. A. Johnston

When soldering irons are left floating on the line under full load they quickly corrode, with the result that work is slowed down while points are cleaned and frequent replacement is required. This may be avoided in shops where it is necessary to keep the irons on for long periods by constructing a "jack" switch of scrap-brass and a piece of phonograph spring.

Cut piece A, shown in the drawing, from a piece of 1/8-in. thick brass and drill out the two holes shown. Now bend the piece at right angles on the dotted line near the



center hole and bend it again in the opposite direction on the dotted line near the point.

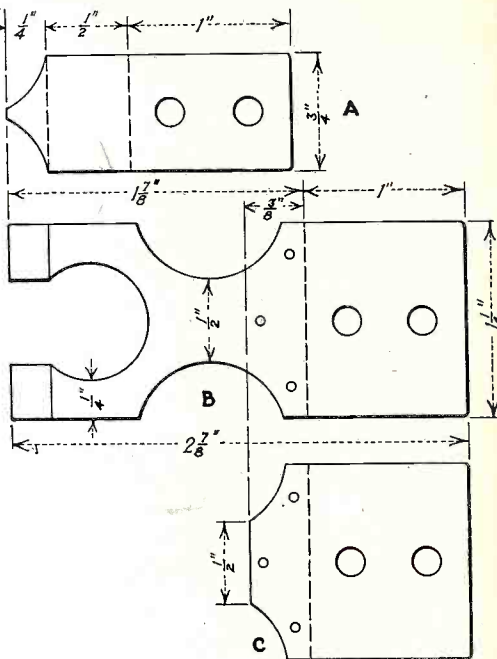
Cut piece C from a similar strip of brass and drill the two holes but do not bend this piece. Cut piece B from a piece of flat

phonograph spring and rivet it to piece C through the three small holes indicated. Then bend B and C, which are now in one piece, to right angle at the dotted line.

Bolt piece A to the front edge of the bench so that the sharp tip points straight at the floor. Then bolt the other assembly directly beneath it so that when a soldering iron is suspended from the phonograph spring its weight opens the jack while when the iron is removed the point of piece A and the phonograph spring touch firmly, closing the jack.

Connect this home-made jack in the circuit shown, including a toggle switch, a three-amp fuse, a 60-watt lamp and a plug receptacle for the soldering iron leads.

To heat the iron for the day's work close the toggle and remove the iron from the phonograph spring from which it is normally suspended when not in use. This cuts out the lamp and permits the iron to heat quickly. Now replace the iron on the



jack and it will stay heated without ever getting too hot.

A larger or a smaller lamp may be substituted to suit the fancy of the user or the particular iron selected.

Keeping Irons Clean

By Hardus Sorkness

Where a.c. supply voltage is higher than normal, soldering iron tips may be prevented from burning up in this manner. Remove all the wire from an audio transformer and re-wind 250 turns of number 20 enamelled wire tapped at 150, 175, 200 and 225 on the core. Insert this unit in series with one side of the supply line, using the tap which gives best results.

This method is superior to straight resistive control as the coil wastes less current. It should, of course, not be used on d.c.

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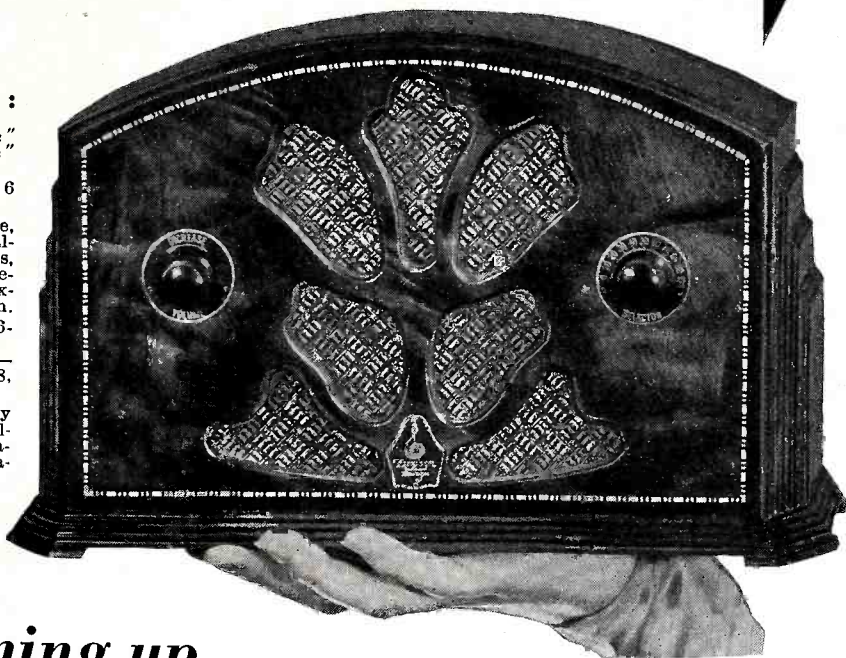
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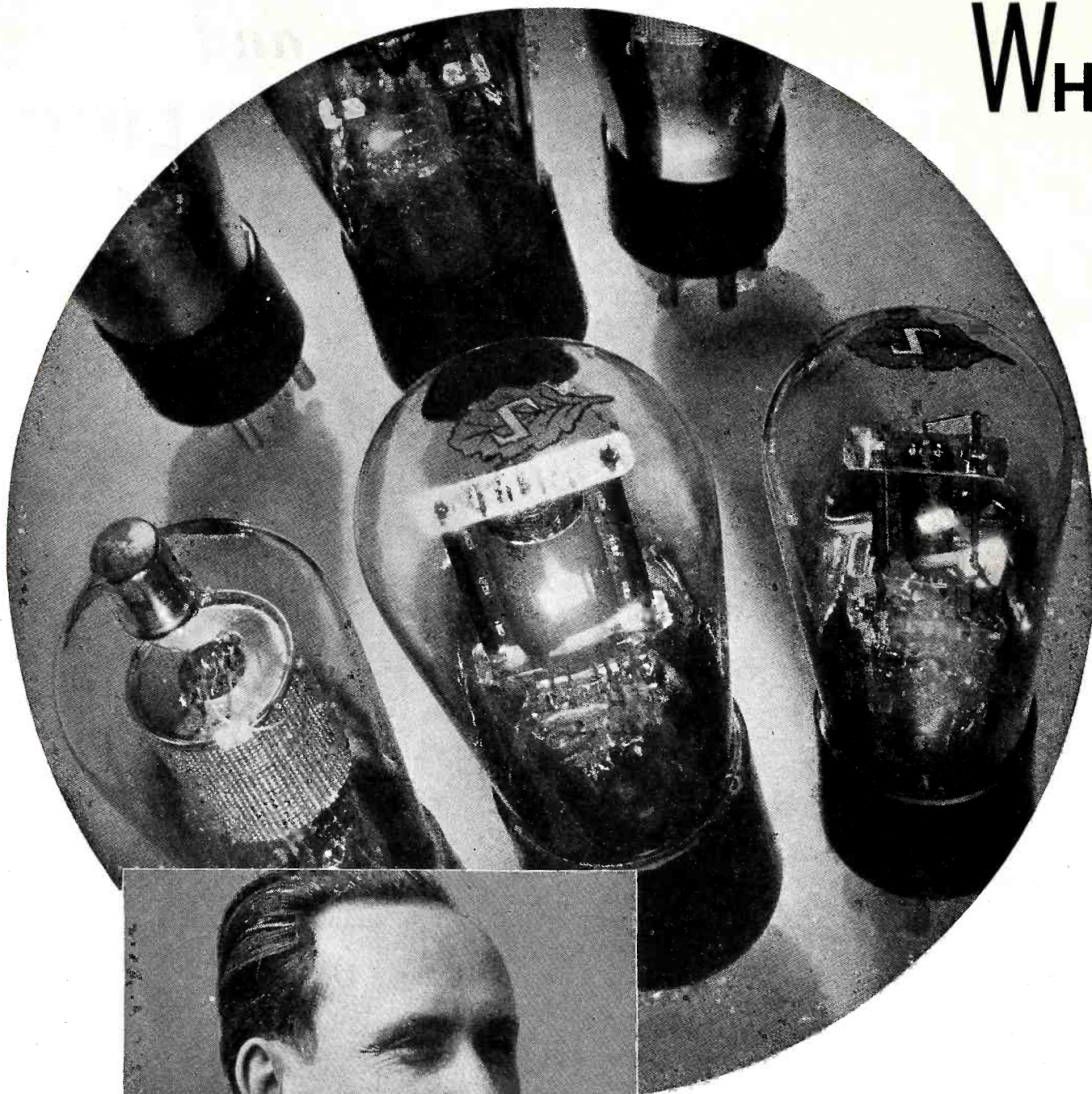
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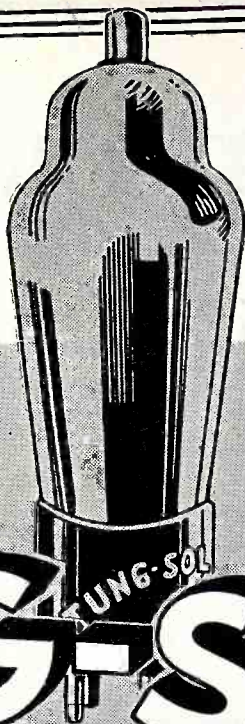
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REGARDLESS of whether you are a prospective Kelvinator dealer or a competitor, you will be interested in knowing that Kelvinator goes into 1933—the 19th year—with the *most salable* line of merchandise Kelvinator has ever had—and with the largest advertising campaign and the most comprehensive sales promotion program in Kelvinator history.

Space doesn't permit a long discussion of the line. But, we must point out such noteworthy features as the KeepCold Defroster which permits refrigeration while defrosting, 4-Zone Cold, *fully automatic operation*, World's Fastest Freezing Speed and the Kold-Keeper—all of which are *exclusive with Kelvinator*, and each of which represents an important engineering feature and an immensely valuable sales feature.

Also, we must point out the fact that the 16 new Models reach practically *every prospect for an electric refrigerator*, which means that the Kelvinator dealer is not confined to one market, or one price field, but that *every prospect for an*

electric refrigerator in his town is his prospect. Dealers, who, during the past year, have tried to overcome the handicap of an incomplete line, will appreciate the significance of that statement.

Kelvinator distributors and dealers who have gone over our advertising and merchandising plans for 1933 say that they are the most complete—the most helpful they have ever seen. We shall gladly explain these plans to dealers interested in the Kelvinator franchise, knowing that any good merchandiser will see in our program an opportunity to *make money*.

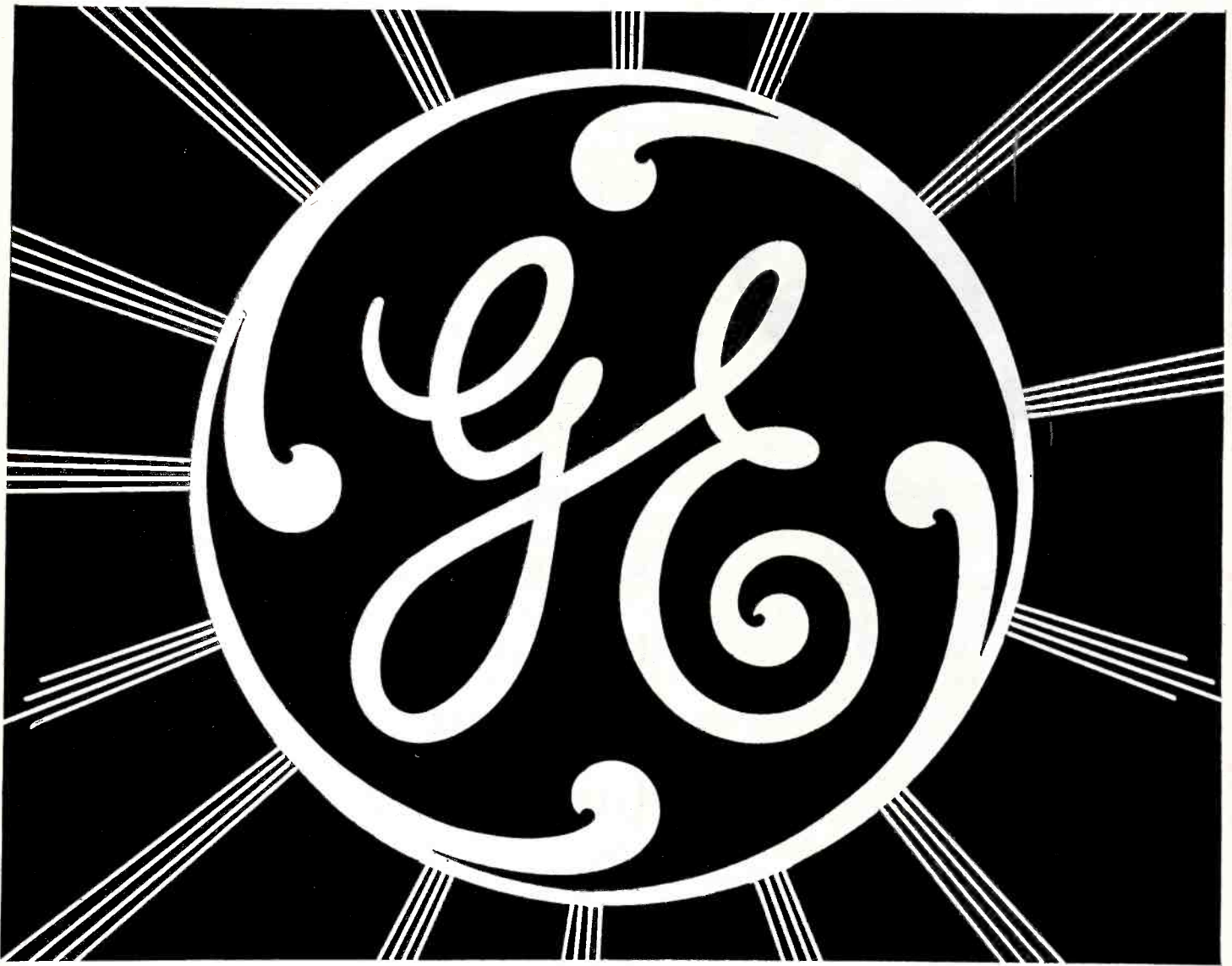
We are looking forward to 1933, confident that it will be another great year for Kelvinator. And, if you are interested in getting the complete Kelvinator story for 1933, write us and we shall ask a representative to call, with full authority to *talk business* with you.

☆ ☆ ☆

KELVINATOR CORPORATION, 14263 Plymouth Road, Detroit, Michigan. Kelvinator of Canada, Ltd., London, Ontario. Kelvinator Limited, London, England.

Kelvinator ⁽⁶³⁰⁾

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Clip this coupon and learn how *you* can share in the profits that are coming from the *new* General Electric Radio Plan for 1933. Mail this coupon *now!*

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GENERAL  ELECTRIC RADIO

FORWARD



That command . . . ever the signal for an advance . . . has been given to the entire organization—engineers, factory workers, sales force—and today they are ready, mobilized into one great fighting force—the RCA Victor Company.

This spirit of cooperation

RCAVictor

MARCH !!!

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This spirit of cooperation

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MARCH !!!

has paved the way for advanced and assured progress in radio and its allied fields.

Our dealers are invited to join with us in a new, progressive, aggressive sales program, to make 1933 an epochal year and re-emphasize RCA VICTOR'S leadership.



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* * *

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- new tubes
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- new circuits
- testers and meters
- microphones
- multiple installations
- service costs
- parts and supplies
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ADVERSE business conditions have forced many people, who normally would have purchased a new set, to use the old model for another year. That means another service job and with it another problem for the service man. Because of this increased emphasis on service work, Radio Retailing is increasing its service information and publishing more and more of those practical, "bread and butter" articles that have become so popular with dealers and service men throughout the country.

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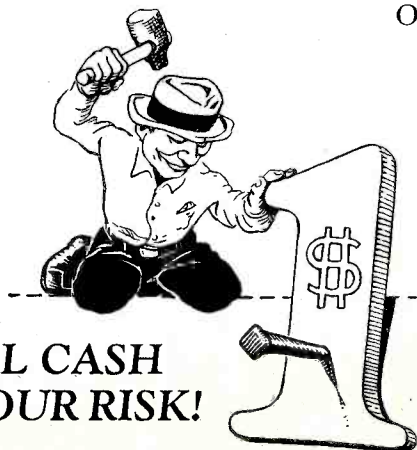
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THE Ken-Rad Corporation is one of the few old-established radio tube manufacturers in business today. It was founded and has been built upon a solid foundation. Ken-Rad is still making, and will continue to make, the best possible radio tubes — tubes that can be relied upon to deliver dependable, long life.

THE KEN-RAD CORPORATION, OWENSBORO, KY.
Division of Ken-Rad Tube and Lamp Corporation

**Service Men
and
Managers:**

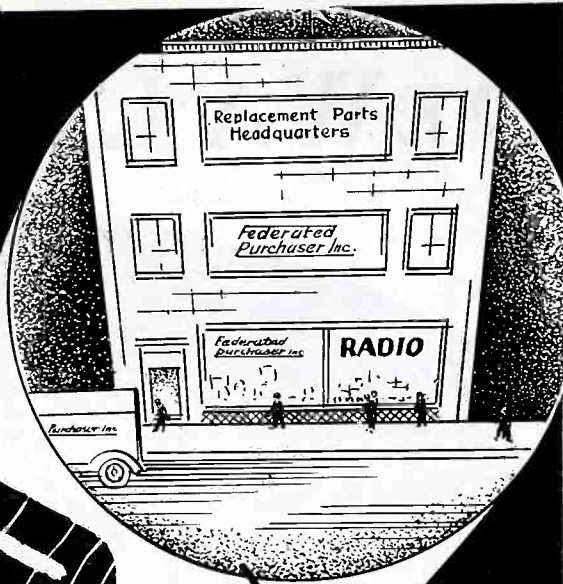
▲ THIS issue of *Radio Retailing* contains six solid pages of usable service helps — service tools in type — commencing on page 31. A regular feature of *Radio Retailing's* editorial co-operation.

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& SERVICEMEN**

You Boys need
**SPEEDY
SERVICE**

and
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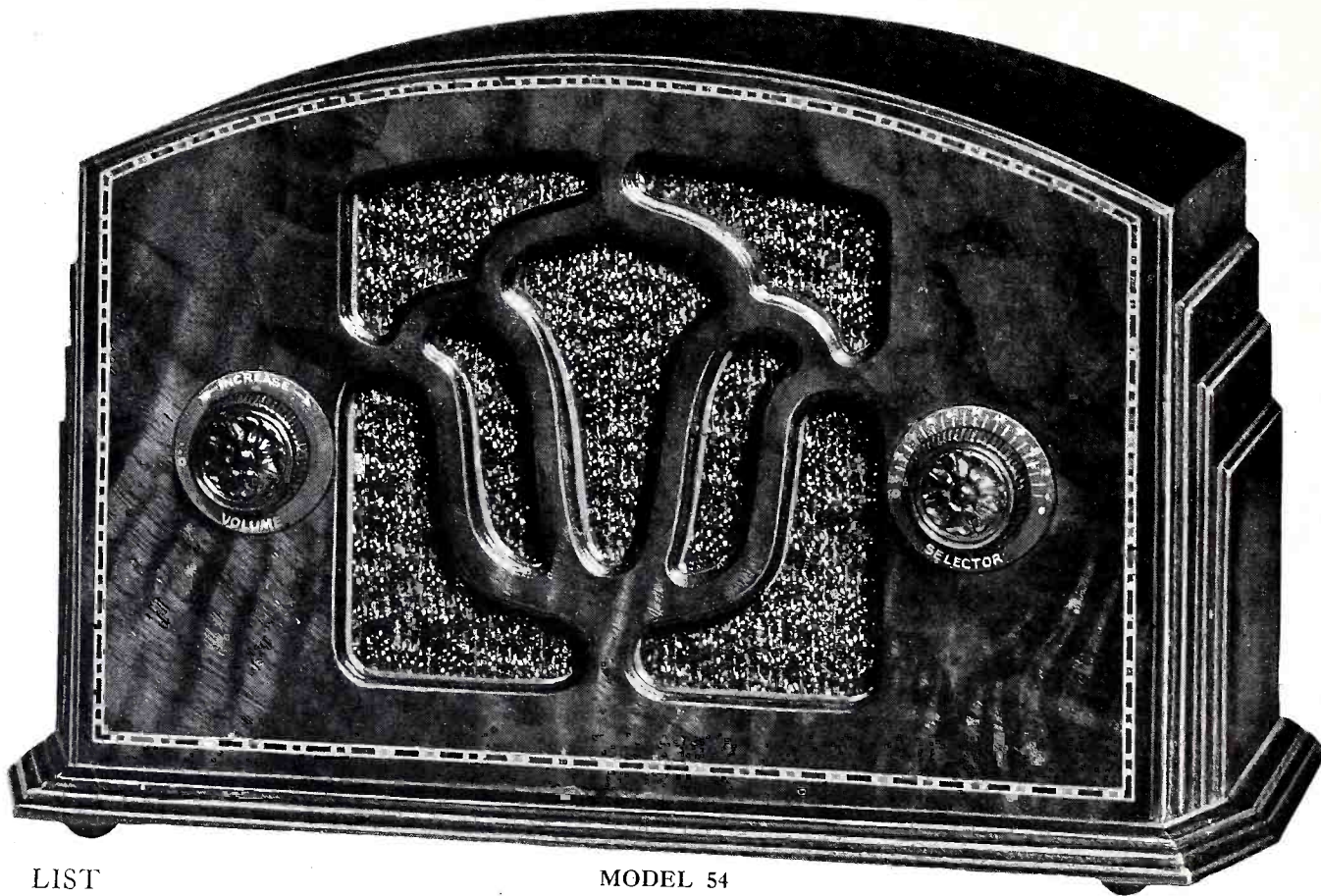
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