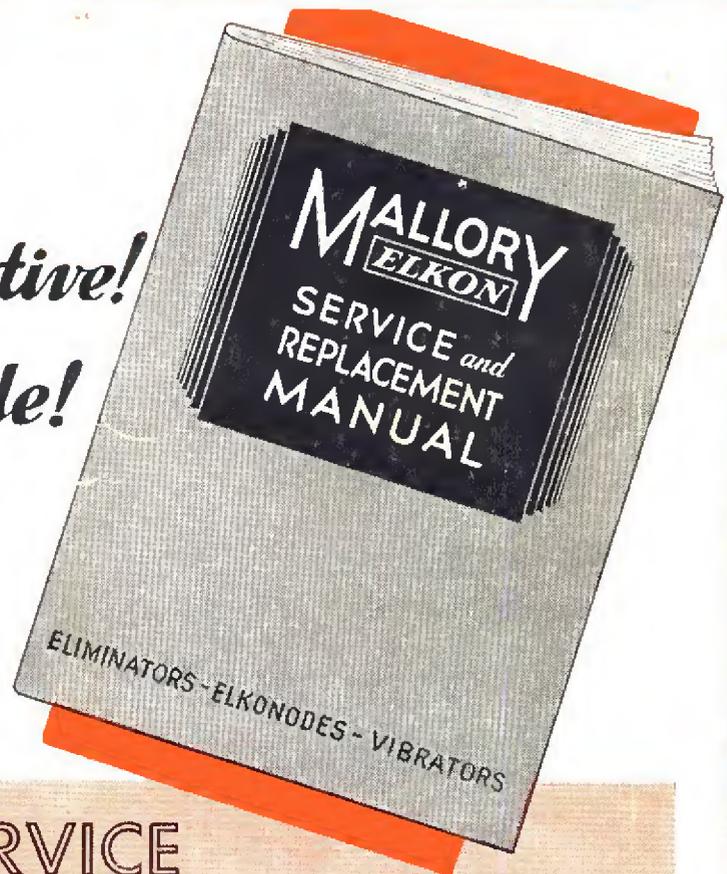


RADIO RETAILING

INCLUDING
SERVICE
AND
INSTALLATION
SECTION

HOME ENTERTAINMENT MERCHANDISING

- *it's Complete!*
- *it's Authoritative!*
- *it's Invaluable!*
- *it's Free!*



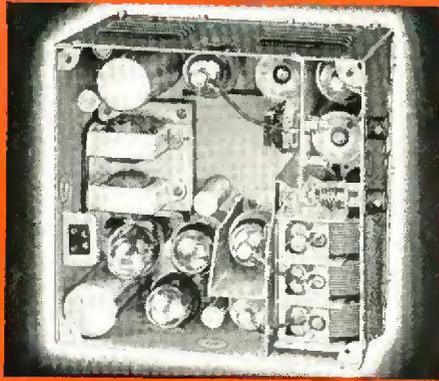
WHEN YOU SERVICE
AUTOMOBILE RADIO SETS...

Save Time and Money with this Book

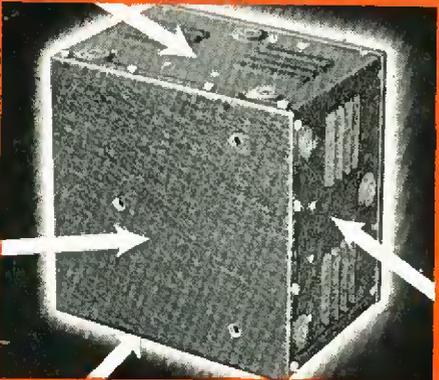
● Mallory put information in this Manual that will put money in the pockets of any man who wants to be prepared to meet the ever-increasing requirements of the automobile radio industry. ● Containing 28 pages of authoritative information, it will prove a tremendous help in making 1935 a more profitable year. Don't fail to write for your copy today—it's absolutely free!

P. R. MALLORY & CO., Incorporated
INDIANAPOLIS, INDIANA

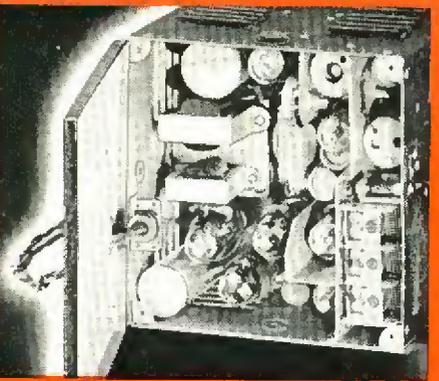
CABLE ADDRESS FELMALLO



Standardized Chassis Design—All three models in metal case of the same size. Tubes and other parts exposed for service by removing the front cover. Model 27 chassis above.

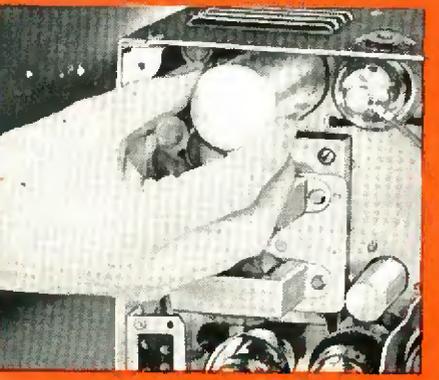


4-Way Mounting—Easy to mount all models in best position for every make of car. Holes for mounting studs are on three sides and back of case to give choice of four positions.



Chassis construction integral with mounting case. Eliminates the causes of many car radio service problems—simplifies and reduces service required. Model 37 chassis with front cover removed, above.

Double Sound-Proofed Plug-in Fibrator is as easy as a tube to remove as shown below. Sound-proofing insures silent operation.



Features that Make

the New Arvins Easy

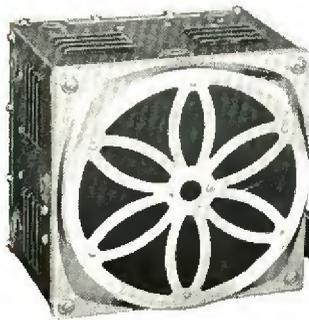
to Sell and Service

● Everyone who hears the new Arvins is convinced that car radio performance has never reached such a high degree of perfection before. It's truly magnificent—and all due to the advanced ideas of design and construction that Arvin engineers have introduced—features that improve Arvin Car Radio reception and make it easy to sell, install and service the new Arvins.

The new Arvin Car Radios are being backed by the most powerful merchandising program in car radio history—full-color "bleed" pages appearing in *The Saturday Evening Post*, starting this month—everything in the way of dealer display material and other selling helps to build a big sales volume for you on the modern, distinctive and beautiful new Arvin Car Radios.

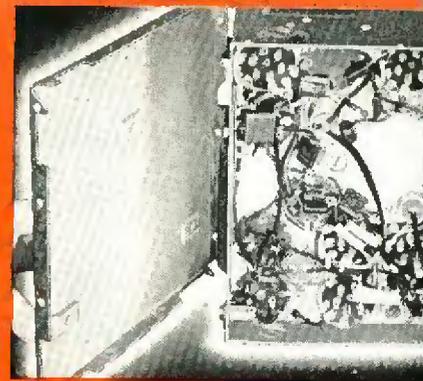
Arvin offers you the outstanding money-making proposition on car radio. Cash in on it! See an Arvin jobber or write for full information.

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

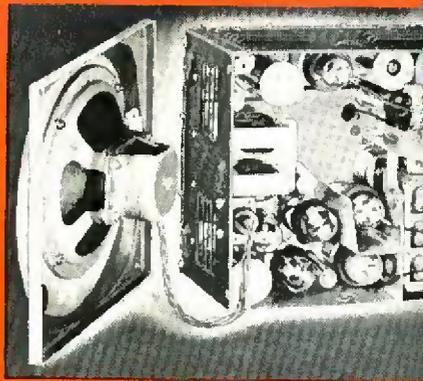


Model 27—one of the new Arvins with airplane type dial and streamlined remote control. A 7-tube set to retail for **\$54.95**

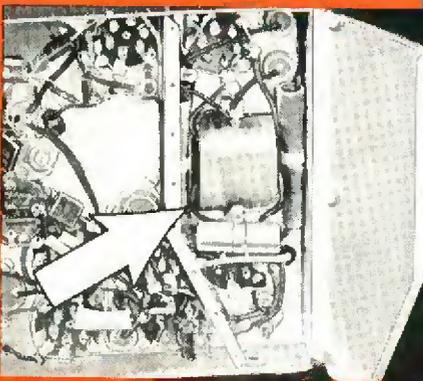
Model 17 is a 6-tube set \$44.95. Model 37 is a twin-8 for \$64.95.



All Vital Parts Easy to Reach by removing back or front cover of set. Everything that ever needs service is readily accessible. Makes it quick and easy to service the new Arvins.

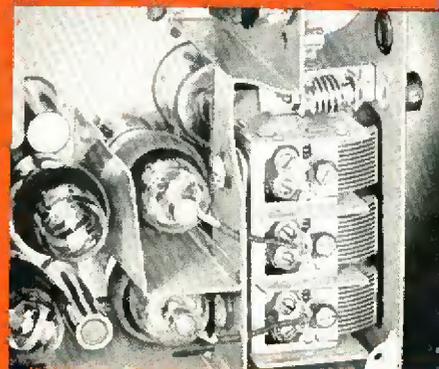


Heavy-Duty Tone-Matched Speaker built in front cover of single-unit models. Comes out with front cover, exposing radio chassis, without taking set from car.

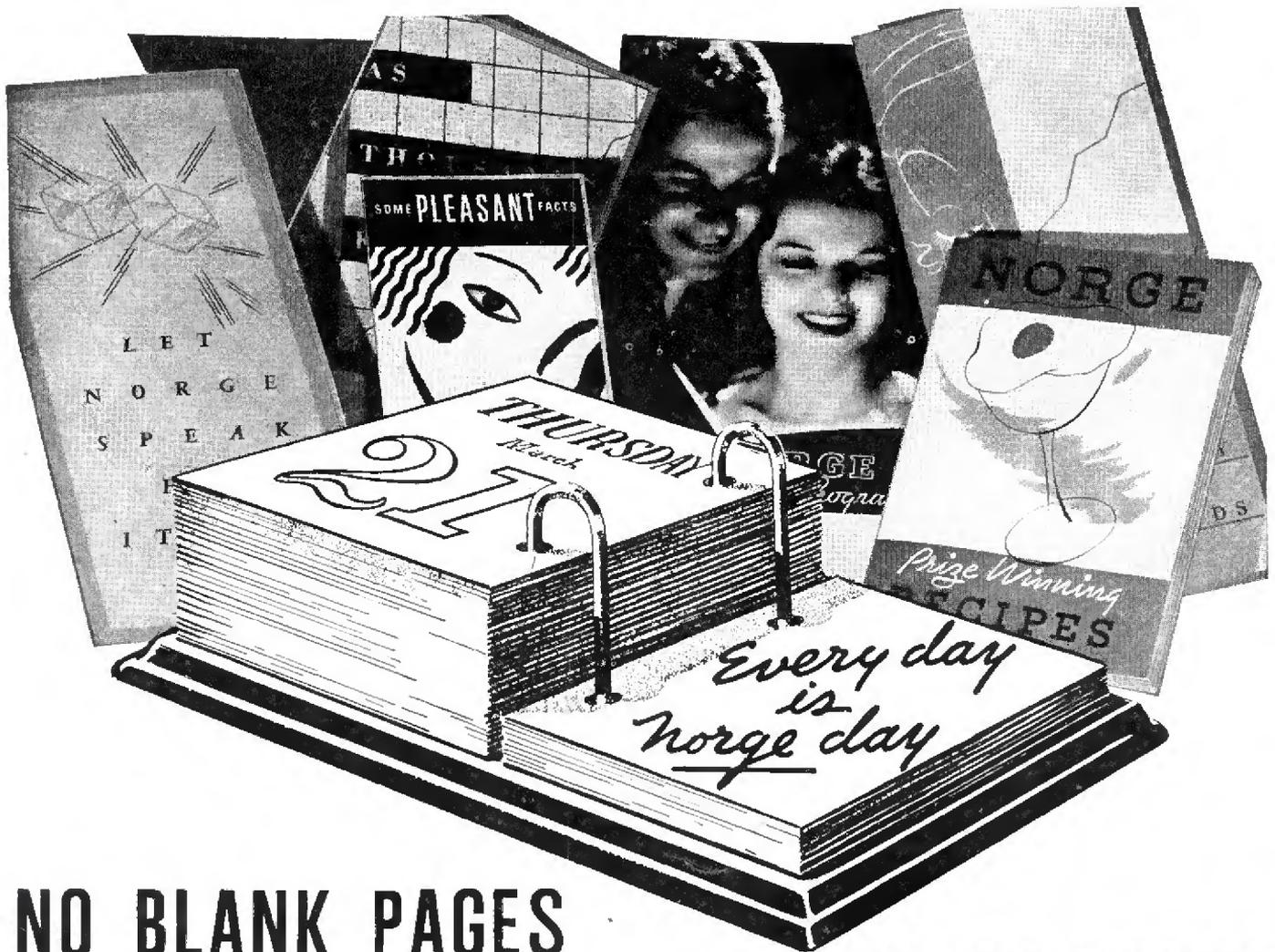


Built-in Motor Noise Filter System. Shown above with compartment cover removed. Eliminates need for spark plug suppressors on many cars and contributes to Arvin performance.

Velvet Drive Tuning System with high ratio worm drive which provides greater station selectivity and tuning accuracy. Pictured below.



ARVIN
THE MAGNIFICENT
Car Radio



NO BLANK PAGES IN THE NORGE DEALER CALENDAR

● Norge dealer co-operation, Norge advertising, Norge progress are never-ending. Like the waves on a stormbeaten coast, one surge follows another, and Norge dealers are constantly backed up with aggressive seasonal sales support.

The mechanical superiority of Rollator Refrigeration has national consumer recognition. Norge has long led the field in the modern beauty of its design, in convenient appointments. Norge originates. And the customer who has "shopped around" always sees *Plus Values* in the Norge.

Norge advertising is always planned to stop the reader and make him think; window displays pay the rent; sales plans inspire enthusiasm of salesmen to profitable effort.

With Norge there is no dull season—a sales plan for every month. And as evidence that they work, witness the Norge march of progress throughout the years . . . its steady rise to prominence in the refrigeration field.

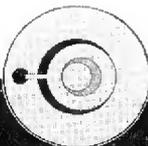
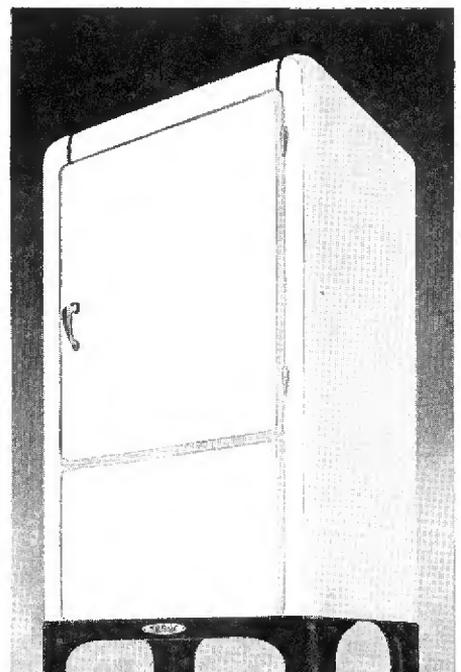
As further assurance of year-around profits for the dealer, Norge now offers

a washer, an oil burner, an electric range, a gas range, a Broilator and an Aerolator air conditioner.

Write, wire or phone for details of the Norge program and line of products.

NORGE CORPORATION
Division of Borg-Warner Corp., 606-670
E. Woodbridge St., Detroit, Michigan

- Norge Rollator Refrigeration
- Norge Electric Washers
- Broilator Stoves
- Aerolator Air Conditioners
- Whirlator Oil Burners
- Norge Gas and Electric Ranges

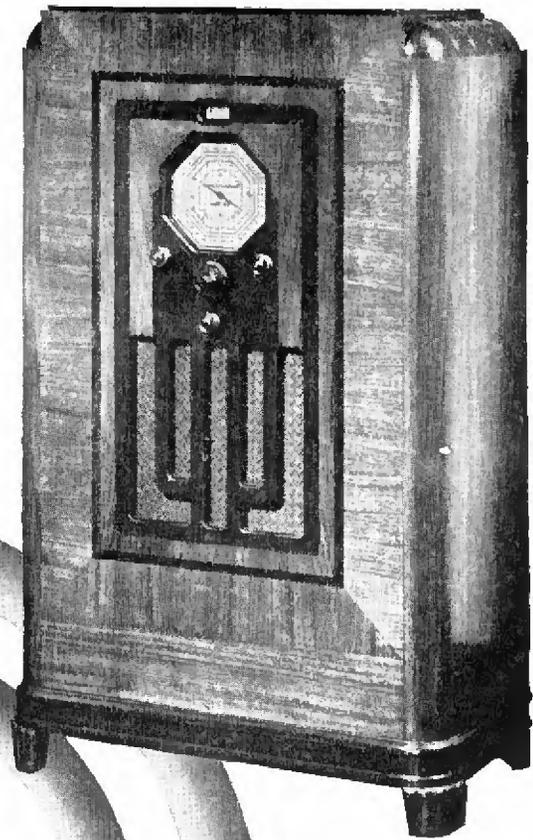


THE ROLLATOR... Smooth, easy, rolling power. Result—more cold for the current used. Only Norge has the Rollator cold-making mechanism.

NORGE

Rollator refrigeration

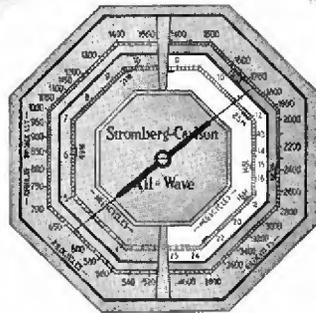
Send these
sets out
SELLING!



No. 68
ALL-WAVE

Price, East
of Rockies,
\$185

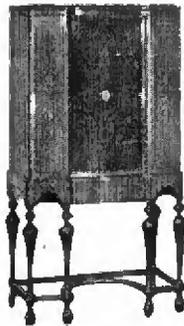
View of the exclusive Stromberg-Carlson Selectorlite Dial showing one of the four tuning sections illuminated, indicating that the range switch is set for tuning in that section.



**EVERY ONE SOLD
SELLS MANY MORE**



NO. 68-R ALL-WAVE.
Covers from 540 to 25,000 kc. Push-Pull Class A Triode Amplification. Output 15 watts. Automatic Volume Control. Visual Tuning Meter. Tone Control. Low Tune Compensation. Unusually large, acoustically correct baffle. Height 48½ in. Price, East of Rockies, \$225



NO. 60-II TREASURE HIGHBOY. Covers from 540 to 1570 kc, and 5500 to 15,500 kc. Reception from all over the world. Sliding doors. Push-Pull Class A Triode Amplification. Automatic Volume Control. Tone Control. Height 47½ in. Price, East of Rockies, \$135

Never before have there been radios that bring in so many unsolicited inquiries, for every one sold, as do these new Stromberg-Carlsons.

They are their own best salesmen. The superiority of the Selectorlite Dial and Dual Ratio Tuning Knob over any other all-wave tuning system is instantly apparent. Their Natural Tone on *all* wave bands thrills both the radio expert and the casual listener. The beauty and sturdiness of their cabinets makes them desirable in any home.

The No. 68-R All-Wave and the No. 60-II Short Wave-Broadcast Radio are outstanding highboys that are particularly appealing to women. Dealers wishing to build a profitable "repeating" business in the short wave season just ahead should investigate the unusual possibilities in the Stromberg-Carlson franchise.

Stromberg-Carlsons range in price from \$69.50 to \$985.00 (East of Rockies).

STROMBERG-CARLSON TELEPHONE MFG. CO.
ROCHESTER, NEW YORK

"There is nothing finer than a Stromberg-Carlson"



Stromberg-Carlson



ONLY - DELCO AUTO RADIOS

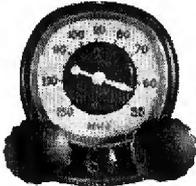
have -

- SYNCRO-TUNING
- A MERCHANDISING PLAN THAT SELLS!

Here is a *new* car radio—with exclusive Syncro-Tuning—and with a franchise and merchandising plan that *assure* you of profits! **FOUR MODELS**, all competitively priced, completely cover the market.

FULL DISCOUNTS allow distributors and dealers a *liberal* profit! Profit protection with a warranty covering both parts and labor! A 50-50 co-operative advertising plan includes the following:

The new
DELCO SETS



Delco is the only auto radio with Syncro-Tuning. The new sets establish a new high standard in design, construction and performance.

Syncro-Tuning automatically synchronizes the radio with the antenna, brings in more stations, gives greater volume and selectivity.

Features: Four Models—Syncro-Tuning—Under-Car Antenna—Universal Control—Overhead Speaker—Dustproof Dynamic Speaker—Fidelity Audio Tubes—Synchronous Vibrator—High Power Audio Output—Easy Installation.

Direct mail pieces, in colors, with strong selling copy.



Large cloth banner/lithographed in colors, for inside and outside use.



FREE window streamer and newspaper advertising mats. Newspaper space on a 50-50 basis.



Striking counter display in which radio can be mounted for a "playing demonstration."



Demonstrating display stand that gives prospects a chance to actually see and hear this sensational new radio. No other display stand like it on the market!

Mail coupon now and get complete details of Merchandising Plan!

UNITED MOTORS SERVICE 3044 West Grand Blvd. Detroit, Michigan

UNITED MOTORS SERVICE, 3044 West Grand Boulevard, Detroit, Mich. Please send your complete Merchandising Plan on the new Delco Auto Radios.

c Name _____ Address _____

The Most Sensational New Patent in Electric Refrigeration!



... brings bigger profit opportunities to Refrigerator Dealers

➡ Dealers throughout the United States have shown an overwhelming preference for the new Fairbanks-Morse refrigerator. Three months ago, we did not have a single dealer. Today, we have dealers in every important town from coast to coast!

Dealers saw and bought the new Fairbanks-Morse because of the exclusive new CONSERVADOR—the most amazing money-saving patent in electric refrigeration!

They saw in the CONSERVADOR a new feature that would lessen sales resistance. They knew that every housewife would prefer it because of its saving in time! In food! In electricity! In space! In money—year after year!

Most important, these dealers realized that the CONSERVADOR had tremendous sales possibili-

ties. Its remarkable money-saving advantages are obvious to everybody. Women can see it. They can understand it. That's why it's so easy to sell. Why it offers greater profit opportunities!

Get in on the ground floor *now!* The Fairbanks-Morse franchise is the most valuable dealer arrangement offered for 1935! Write, phone or wire for complete information and name of nearest distributor. Fairbanks-Morse Home Appliances, Inc., 430 South Green Street, Chicago.

Cable Address: FAIRMORSE, CHICAGO



FAIRBANKS-MORSE

RADIOS-WASHING MACHINES-IRONERS

105 YEARS OF PROGRESS IN PRE

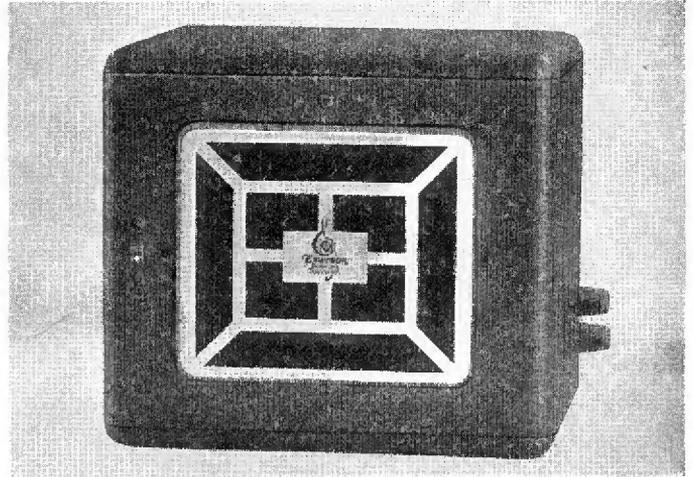
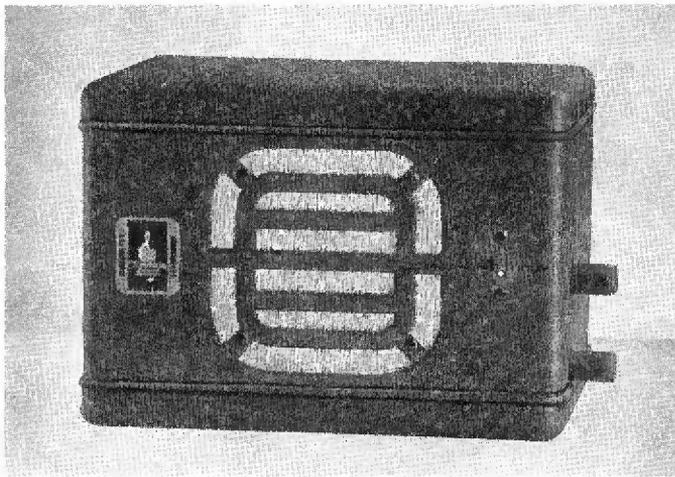


CISION MANUFACTURING

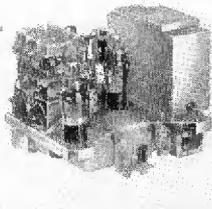
Refrigerators

Emerson AUTOMOBILE Radio

WITH "FORTIFIED CHASSIS" IN MODERN DIE-CAST CASE



"6-A" Six-tube superheterodyne, using dual-purpose tubes —SINGLE UNIT. New plug-in non-synchronous type of vibrator. Features include special filters and traps which eliminate spark plug suppressors. 3-gang condenser—automatic volume control and tone control—diode detection—use of powerful 41 pentode and new dust-proof 5-inch dynamic speaker insure faithful reception. Strong case of modern design. List price, with Radiotrons, **\$39.95**



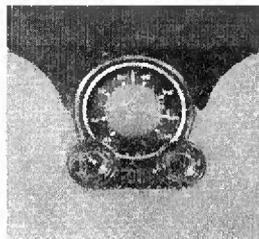
"FORTIFIED CHASSIS"

Fortified against spark plugs, road shocks, dust, heat, cold and humidity.

"5-A" DeLuxe five-tube superheterodyne using dual-purpose tubes — new plug-in type full-wave synchronous vibrator—equivalent of 7-tube set. Sturdy full DIE-CAST modern case overcomes rattles and exposure. Includes 3-gang condenser, automatic volume control and tone control, full SIX-inch dynamic speaker. No spark plug suppressors required. Only two holes required for mounting. Truly the sensation of 1935! **\$44.50** List price with Radiotrons,

**Modern Features
Check the Values**

Beautiful for display—easy to install—moderate in price—more dependable in performance—Emerson "Fortified Chassis" Auto Radio embodies features which place it in the forefront of the industry. Full details will be sent on request.



Choice of Mounting

Indirectly illuminated remote control may be mounted on steering post, on instrument panel or beneath panel. Parts furnished.

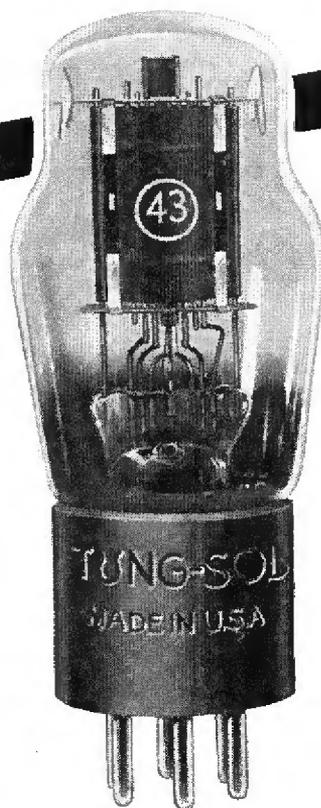
**Distributors—Dealers
Write or Wire**

The Emerson Auto Radio proposition offers much more than usual money-making opportunities. Powerful advertising, window displays, demonstrations and literature—with active field cooperation—are all available. Send for particulars now.

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

119 brands of tubes
 have been made by 12
 licensed manufacturers

One of these manufacturers...
 Tung-Sol, makes **ONE BRAND**
 for the entire United States...
TUNG-SOL... with only one
 standard of quality and one mer-
 chandising policy: a full profit
 for the retailer on every sale.



TUNG-SOL

Tone-flow radio Tubes

are marketed under a time-proven Protection Plan by
 selected Tung-Sol retail partners. Qualified independ-
 ent dealers are invited to write us for complete details.



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

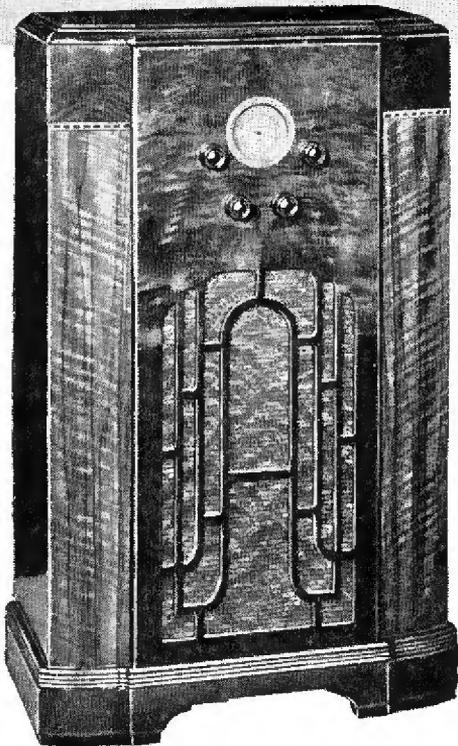


Use Tung-Sol
 panel bulbs

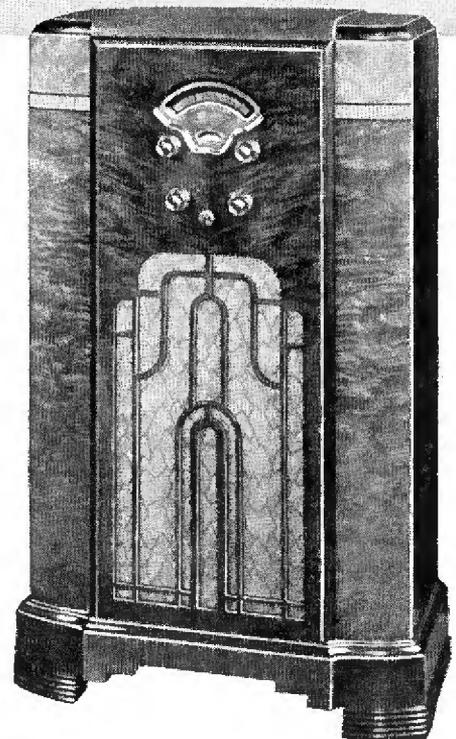
ATWATER KENT

adds new profits to 1935

RADIO



AT LEFT: Model 475B—triple band combination short-wave and broadcast 5-tube receiver, improved sensitivity and selectivity, 2-speed tuning, automatic illumination on airplane dial by tuning bands, striking cabinet of fine figured woods. **\$59.75** f. o. b. factory.

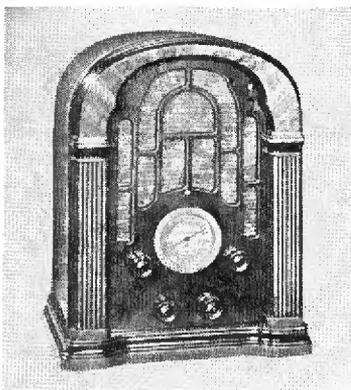


AT RIGHT: Model 318C—four band all-wave, including everything from 540 kilocycles to 22½ megacycles, powerful 8-tube receiver, marvelously sensitive, 6-gang condenser, 11-inch speaker, automatic full-vision dial, shadow-tuning, finest walnut and burl maple cabinet. **\$99.75** f. o. b. factory.

Announcing

NEW MOTOR CAR RADIO

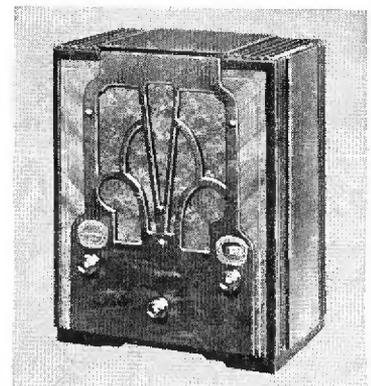
Model 776 **\$49.90** f. o. b. factory



AT LEFT: Model 735—Same chassis as Model 475B above. Sensational profit-maker—the sort of “radio hit” for which Atwater Kent is famous. Behind curtains it wins “ear test” against competing radios that cost twice as much. In the show-room it turns doubtful “lookers” into “hot” prospects at a glance. **\$48.50** f. o. b. factory.

AT RIGHT: Model 854—Four tubes, four tuned circuits, range 540 to 1720 kilocycles, two-position tone control, sensitivity control. **\$27.50** f. o. b. factory.

Prices subject to change without notice





"HE'S NEVER "GYPPED" US ON TUBES OR ANY THING ELSE - SO LET'S BUY OUR REFRIGERATOR FROM HIM"

Maybe your customers never said that in so many words. But it's that unspoken thought—that confidence in your reliability—which brings them to your store for refrigerators, sets, accessories, service, etc.

If you have ever sold a customer a "just-as-good" tube, you've lost his business on all your other lines too. Don't risk his goodwill and your profits. Sell Arcturus—the quality standard of the radio industry.

Not only has Arcturus earned the unqualified endorsement of set manufacturers and engineers, but millions of set owners in the U. S. and 78 foreign countries acclaim it. Arcturus pioneered 6 out of the 7 fundamental developments in a.c. tubes. Arcturus long-life records are unequalled today.

You can recommend Arcturus safely and unhesitatingly. Follow the lead of thousands of successful dealers. Display and sell Arcturus! Arcturus Radio Tube Company, Newark, N. J.



ARCTURUS

RADIO TUBES



22 Sales-building HELPS for Dealers and Service-Men in Arcturus' big Portfolio.. SEND COUPON

Please check your favorite sales and service aids below. Send list with coupon today. Our jobber will show you this big portfolio.

- | | |
|---|---|
| <input type="checkbox"/> Tube Stickers | <input type="checkbox"/> Window Display Sets |
| <input type="checkbox"/> Book Matches | <input type="checkbox"/> Characteristic Chart |
| <input type="checkbox"/> Post Cards | <input type="checkbox"/> Portable Tube Tester |
| <input type="checkbox"/> Cuts and Mats | <input type="checkbox"/> Counter Tube Tester |
| <input type="checkbox"/> Electric Sign | <input type="checkbox"/> "Dayrad" Oscillator |
| <input type="checkbox"/> Decalcomania | <input type="checkbox"/> "Dayrad" Set Tester |
| <input type="checkbox"/> Service Policy | <input type="checkbox"/> "Supreme" Analyzer |



- | | |
|---|--|
| <input type="checkbox"/> Price Card | <input type="checkbox"/> Ad Reprints |
| <input type="checkbox"/> Stationery | <input type="checkbox"/> Display Cartons and Tubes |
| <input type="checkbox"/> Window Streamers | <input type="checkbox"/> Rider's Manuals (incl. Vol. 5) |
| <input type="checkbox"/> Log & Price List | <input type="checkbox"/> "Supreme" Tube Tester (Neon lamp) |

ARCTURUS RADIO TUBE CO.
Newark N. J. (Dept. 335)

I want to look over your big portfolio of dealers' sales and service helps.

Name _____

Street _____

City, State _____

Jobber's Name _____

Jobber's Address, City _____

PRESENTS

Safety-Zone

REFRIGERATION

Through an Advanced Principle of Cold Control the Famous Stewart-Warner Slo-Cycle Mechanism Holds Cabinet Temperatures at 42° to 45° F.
—THE SAFETY ZONE FOR PROPER FOOD PRESERVATION

★
● Real food-preservation performance—practical convenience features—proven mechanical dependability—rugged construction—smart appearance. That's the sort of refrigerator line that builds sales success. That's the sort of line that makes sound dealer profits. *And that's what Stewart-Warner offers in three fine groups of refrigerators for 1935.*

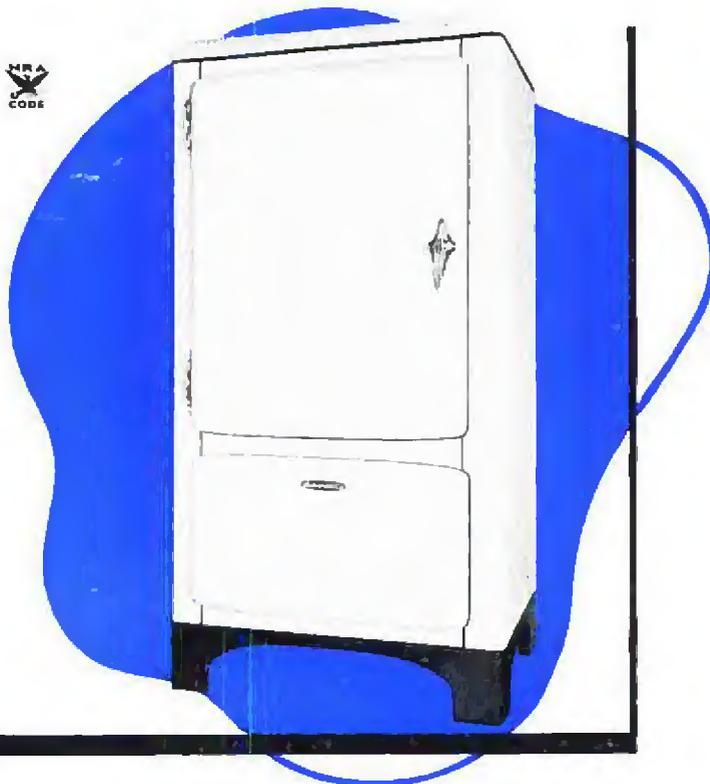
It's a common-sense line from every angle. In Safety-Zone Refrigeration it has the feature that is foremost in every buyer's mind—proper food preservation. In its famous slo-cycle trouble-free and economical mechanism it has the dependability that has taken "servicing" out of the picture—keeps it "sold" and makes your retail profits NET. *Ask any dealer that handles the line.*

New Selling Plans For Dealers— New Advertising—New Merchandising Helps

During 1935 the sale of the Stewart-Warner line will be promoted by a hard-hitting advertising campaign—the kind that builds actual traffic for your store. But we're not stopping with that alone. Tested, proven, practical merchandising plans will back the line from start to finish. Nothing has been overlooked to give the dealer something he can "get his teeth into" and "go to town" on a sound profit basis. New, generous plans for dealer selling are now offered by every distributor—dealer plans that are written from *your* side of the desk—plans that include a discount set-up that is RIGHT.

Make no commitments until you get the facts on Stewart-Warner—"The Line Without A Service Problem." Phone, wire or write your distributor today, or communicate with us direct.

STEWART-WARNER CORPORATION
1855 Diversey Parkway Chicago, Illinois



Above: Model No. 721P, capacity 7.1 cu. ft. (net). Shell area 13.1 sq. ft. (net). Also Model No. 574, capacity 6.5 cu. ft. (net). Shell area 10.5 sq. ft. (net).

STEWART-WARNER

New-Type ELECTRIC REFRIGERATOR

FOR 1935

STEWART-WARNER

Read What the Men Who Sell It
Say About STEWART-WARNER—

*"The Line Without a Service
Problem"*

"If I were asked who influenced me in my decision to take on the Stewart-Warner line of refrigerators, I would answer truthfully—the host of friends I have all over the country—distributors of competitive makes—who told me unanimously that if I could get the Stewart-Warner franchise to 'grab it,' because the line was the most trouble-free and service-free refrigerator line made."

—ADOLPH ULLMAN, Pres.
Northeastern Radio, Inc.
Boston, Mass., Distributors.

"The Stewart-Warner Refrigerators we have sold have required no service, while some other lines we sold have just about taken all the profit during the free-service period. We get nothing but compliments on the Stewart-Warner."

—W. A. PENDLETON
Shelby, N. C., Dealer.

"... we are now 100% Stewart-Warner. We just purchased one solid carload of Stewart-Warner Refrigerators from our distributors, the Moore Electric Company of San Francisco."

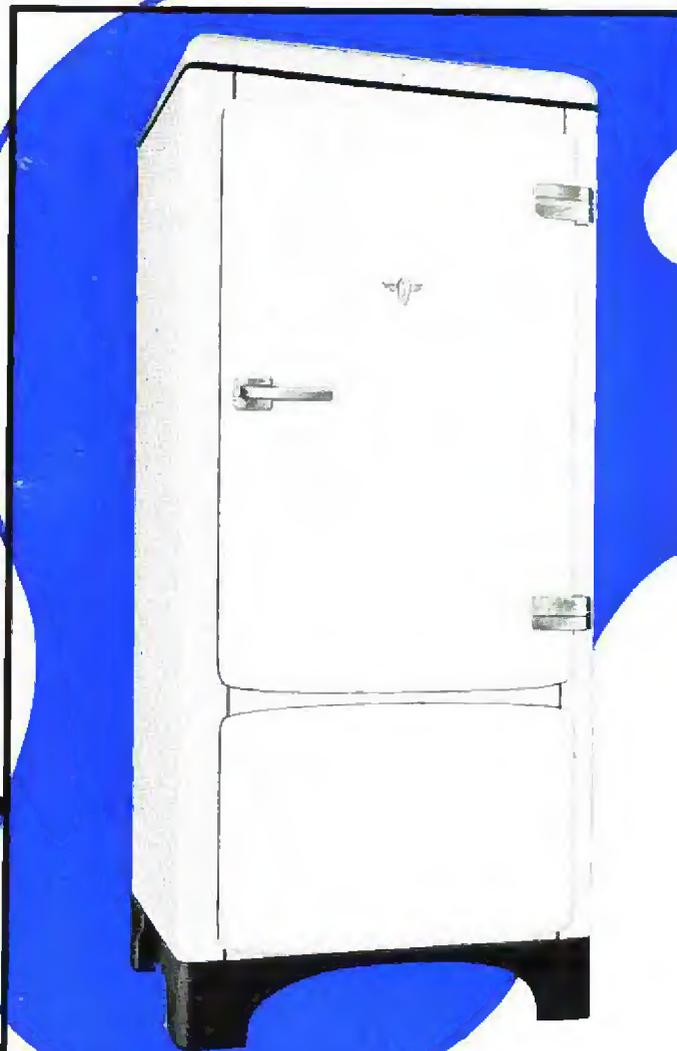
—LOUIS C. SCHRODER
Sacramento, Calif., Dealer.

Let the Matchless, Dependable Slo-
Cycle Stewart-Warner Mechanism
Help You Keep Your Profits in 1935.

WRITE YOUR DISTRIBUTOR NOW

Right: Model No. 605, capacity 6.0 cu. ft. (net).
Shelf area 11.3 sq. ft. (net). Line also includes
Model No. 505, capacity 5.0 cu. ft. (net), with
shelf area 10.0 sq. ft. (net), and Model No. 455,
capacity 4.6 cu. ft. (net), shelf area 9.3 sq. ft. (net).

Below: Model No. 705, capacity 7.1 cu. ft. (net).
Shelf area 13.4 sq. ft. (net). Line also includes Model
No. 555, capacity 5.6 cu. ft. (net), shelf area 10.5
sq. ft. (net), and Model No. 465, capacity 4.6 cu. ft.
(net). Shelf area 9.3 sq. ft. (net).

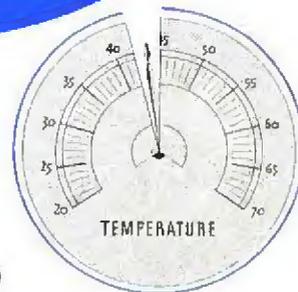


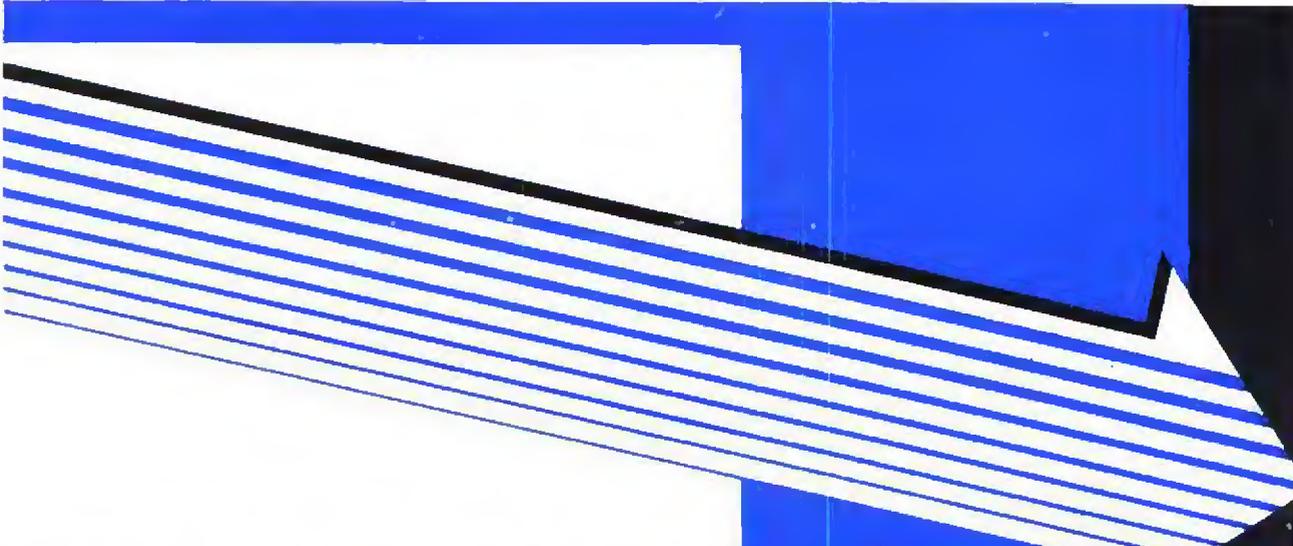
Why

SAFETY-ZONE REFRIGERATION?

Authorities agree that a temperature between 42° and 45° F. is the ideal zone for proper food preservation. This is the zone where foods are kept at their best—at colder temperatures they dehydrate more rapidly with loss

of flavor in the drying process—in warmer temperatures there is danger of spoilage. Stewart-Warner accurately maintains this Safety-Zone Temperature—confines fluctuation to these narrow limits. Does it economically.





**YOU CAN EXPECT
COMMON SENSE** ★ ★
- NOT MIRACLES
FROM STEWART - WARNER

• The Stewart-Warner Refrigerator Line for 1935 boasts of no "miracle gadget" that will make customers tear the hinges off your doors in their rush to buy. It has no "super-colossal" feature that will make an otherwise sensible housewife wring her hands until she owns one. *The Stewart-Warner line is built to the most advanced standards with a real common-sense foundation. It does its most important job exceedingly well. It offers every proven convenience. And it's engineered to give the same dependable, trouble-free service that let Stewart-Warner dealers keep their profits in 1934!*

No, the Stewart-Warner Refrigerator does not offer miracles. It's common sense from the ground up for both the dealer and the user. It's a line with a *proven background*—a line that will *sell and stay sold*—a line that will return *sound profits*. Ask anyone that handles it.

On the following pages we present the Stewart-Warner Refrigerator Line for 1935. Your distributor will be glad to present the hard-hitting sales and merchandising plans that will back it—explain how its freedom from servicing will make your *retail profits NET*.



**WE BELIEVE YOU'LL
BE INTERESTED IN
THE FOLLOWING
PAGES**



THE NEWS ABOUT STEWART-WARNER DEPENDABLE PERFORMANCE

Traveled Fast

In the Last 30 Days Insistent Dealer
Demand Prompted These Distributors

Northeastern Radio, Inc. ★ Shadbolt & Boyd Co. ★ Automobile Sales Co.
Boston, Mass. Milwaukee, Wis. Memphis, Tenn.

H. E. Sorenson Co. ★ Philadelphia Distributors, Inc. ★ Hamburg Bros.
Des Moines, Iowa Philadelphia, Penn. Pittsburgh, Penn.

Peterson Lumber & Paint Co. ★ Domestic Utilities Company
El Paso, Texas Chicago, Illinois

To Join This Able Distributor Group

EAST

Stewart-Warner Sales Co.
Hartford, Conn.
Northeastern Sales Corp.
Lewiston, Maine
Wholesale Radio Equipment Co.
Newark, New Jersey
Ignition Service & Supply Co., Inc.
Albany, New York
H. D. Taylor Company
Buffalo, New York
Wholesale Radio Equipment Co.
New York, New York
City Electric Company
Syracuse, New York

SOUTH

Capital Electric Corporation
Birmingham, Alabama
Capital Electric Corporation
Jacksonville, Fla.
Capital Electric Corporation
Atlanta, Georgia
Stratton & Terstegge Co.
Louisville, Kentucky

Monroe Furniture Company, Ltd.
Monroe, Louisiana

Shaw Distributing Co.
Charlotte, North Carolina

Phillips & Buttorff Mfg. Co.
Nashville, Tenn.

Dix Bowers Co.
Norfolk, Virginia

A. R. Tiller, Inc.
Richmond, Virginia

Bluefield Hardware Co.
Bluefield, West Virginia

R. H. Kyle & Co.
Charleston, West Virginia

House-Hasson Hdw. Co.
Knoxville, Tenn.

MID-WEST

The Field & Shorb Co.
Decatur, Illinois

Mooney-Mueller-Ward Co.
Indianapolis, Indiana

Morley Brothers
Detroit, Michigan

Morley Brothers
Grand Rapids, Michigan

Morley Brothers
Saginaw, Michigan

Marshall-Wells Company
Duluth, Minnesota

Marshall-Wells Company
Minneapolis, Minnesota

Joplin Supply Co.
Joplin, Missouri

Stewart-Warner-Alemite Co.
Kansas City, Missouri

Stewart-Warner Sales Co.
St. Louis, Missouri

H. C. Noll Co.
Omaha, Nebraska

Auto-Rad Supply Co., Inc.
Cincinnati, Ohio

The Geo. Worthington Co.
Cleveland, Ohio

The Geo. Worthington Co.
Columbus, Ohio

SOUTHWEST

The Stewart-Warner Products Co.
Wichita, Kansas

Brandon Company
Little Rock, Arkansas

Service Parts Co., Inc.
Abilene, Texas

Amarillo Electric Co.
Amarillo, Texas

Hall & Purse, Inc.
Dallas, Texas

Star Electric & Eng. Co.
Houston, Texas

Southwest Appliance Co.
San Antonio, Texas

WEST

Stewart-Warner Sales Co.
Los Angeles, California

Moore Electric Supply Co.
San Francisco, California

Stewart-Warner Sales Co.
Denver, Colorado

Alemite Co. of the Northwest
Portland, Oregon

United Electric Supply Co.
Salt Lake City, Utah

Alemite Co. of the Northwest
Seattle, Washington

Alemite Co. of the Northwest
Spokane, Washington

Phone, Write or Wire Your Distributor. Get
Complete Information on The Stewart-
Warner Dealer Plans for 1935.

LEARN HOW YOU CAN KEEP YOUR PROFITS THIS YEAR

Hear! Car-Radio's Greatest Advance in Acoustics in the 1935 **AMERICAN-BOSCH**

ROUND FOR SOUND!

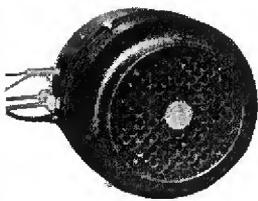


\$52⁹⁵
Model 634
10 TUBE PERFORMANCE
WITH 6 HIGH EFFICIENCY
TUBES

Western Prices
slightly higher

IMMEDIATE DELIVERY!

THIS NEW CAR-RADIO
with its
VIBRO-BALANCED DESIGN
leaps years ahead in prove-
able sales-compelling features...



\$44⁹⁵

MODEL 524
9-tube performance with 5 high efficiency tubes. "Round for Sound", Improved Anchored Construction, Balanced Sensitivity, Sensible Selectivity and other new features.



There are more
AMERICAN-BOSCH
POLICE CAR-RADIOS
in use
than all other
makes combined



American-Bosch's "Police Record"

Last year the police-proven dependability of American-Bosch Car-Radios proved to be one of the most convincing sales makers in the industry. This year our "Police Record" is even more sensational, as still more police departments from coast to coast have adopted American-Bosch exclusively.

American-Bosch presents 2 new car-radios unlike any you've ever seen. Not square. Not oblong. But **ROUND!**

Round, to effect a triumphant advance in the one factor that most vitally affects car-radio sales and car-radio enjoyment—**TONE QUALITY.**

Round, to conform to a recognized principle in acoustical design—**Vibro-Balance**—introduced here for the first time in any car-radio!

Round, to guard the tone against unwanted vibrations and distortions.

Round, to enable the sound to travel continuously, without being broken up.

There have been a lot of empty claims about tone, but the tone quality of these new 1935 car-radios is not an empty claim. Give these new sets an audition and you will be amazed how sparkling, alert, alive car-radio can be!

The *Vibro-Balance* Design is the leader among many new technical ad-

vances in these new 1935 car-radios.

Anchored Construction has new refinements that assure a longer trouble-free life. *Balanced Sensitivity* reduces internal noise to a new low level yet permits satisfactory reception even in the day time... *Sensible Selectivity* makes American-Bosch the easiest-to-tune car-radio and gives clear-cut station separation. Generous rear seat volume at any road speed... a new exclusive tone control (Patent applied for) which sustains volume regardless of whether higher or lower pitch is emphasized... an improved "spark noise trap" that cuts ignition noises—these are a few other sales-compelling features.

Its "police record"... plus the unparalleled parade of engineering features... plus the sparkling tone made possible by *Vibro-Balanced* design... is making American-Bosch Police-Proven Car-Radio the Number One choice of dealers and motorists—for 1935.

Write or wire for full descriptive broadside and new literature illustrating cooperative selling helps.

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

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



Now... "Magic Brain" Auto Radios

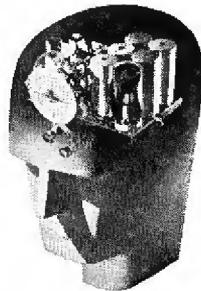
to boost your warm weather profits

Cash in on the automobile trade! RCA Victor now offers you an amazing "sell-up" line of auto radios using the "Magic Brain" principle for superb reception of standard domestic stations.

And so now—on the road—car owners can have the same ease of tuning, freedom from noise, and clear, rich tone which the "Magic Brain" makes possible in the home. A model for every car—new or old—and for every purse. Don't miss the big "Magic Brain" sales opportunities this summer.

No Spark Plug Suppressors Needed

The new RCA Victor auto radios have a built-in antenna—noise-filter—a great RCA Victor achievement which makes spark plug suppressors unnecessary on most modern cars.



RCA VICTOR

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

"MAGIC BRAIN" M-104

New single compact unit, 9-1/16" w., 8-15/16" h., 6-5/8" d., with built-in 6" dynamic speaker. Two-point control. Improved tone quality. "Powertron" gives extra tube reception. Built-in RCA Victor ignition noise filter, streamline control unit, illuminated dial. List price, f. o. b. Camden, N. J.

\$49.95

"MAGIC BRAIN" M-108

New two-unit. Has "Powertron" for extra tube reception. Receiver case 9-1/16" w., 6-3/16" h., 6-5/8" d. Speaker 9" in diameter, 3" deep. With automatic volume control, built-in RCA Victor ignition noise filter, streamline control unit, illuminated dial. List price, f. o. b. Camden, N. J.

\$57.95

"MAGIC BRAIN" M-109

RCA's new de luxe "Magic Brain" auto radio. Two-unit power supply unit. Built-in RCA Victor ignition noise filter, streamline control unit, illuminated dial, 10 to 1 tuning ratio. Receiver case 7-3/8" w., 6-15/16" h., 6-1/8" d. Separate oversize dynamic speaker 8-5/8" square. Amazing sensitivity and selectivity. The finest auto radio that RCA Victor ever built. List price, f. o. b. Camden, N. J.

\$74.95

NEW DI-POLE AUTO ANTENNA

The new steel-topped bodies require an under-car antenna.

RCA Victor's answer is the new folded di-pole, designed on the same principles as those used in transoceanic service. It has 96", folded to 48" over-all, of effective length.

Clamped under the running board, it provides real signal pick-up.

Low priced, easily installed.

PRICE LEADER M-107

A single unit receiver with dynamic speaker, of proved performance. List price, f. o. b. Camden, N. J., now only

\$39.95

RADIO RETAILING

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Washington

MARCH 1935

VOL. 20

NO. 3

Radio Demonstrates

its VITALITY

IN this issue *Radio Retailing* presents its annual statistical sales survey of the Radio Industry. A grand total of 4,696,000 radio receivers were manufactured last year—A GREATER NUMBER THAN ANY YEAR SINCE THE ADVENT OF BROADCASTING. Export shipments (612,000 sets) reduced the domestic sales volume to 4,084,000—still our best year with the exception of 1929 and 278,000 sets ahead of '33.

RADIO RETAILING takes pardonable pride in this year's presentation of the saturation and replacement sales picture. Both are based on comprehensive and adequate field surveys.

In a market where 19 out of every 30 homes already owned a set—as of December 31, 1933, radio *merchants*, last year, persuaded 2,250,500 users to buy a more modern receiver. Although 69.4 families out of every 100 now own a radio, we predict that this same brand of salesmanship will carry us on to even greater heights this year.

IS radio losing its grip on the public? Decidedly NOT! Last year's buying interest should spike for a long time to come the fallacy that radio is but a passing fancy. Modern civilization has accepted this miracle of mass communication as its permanent heritage. Rapidly crystallizing improvements in the art and new applications of the electronic tube will maintain, will intensify, this demonstrated public interest.

RADIO SALES

DOMESTIC

1933

1934

Table Models
2,226,000

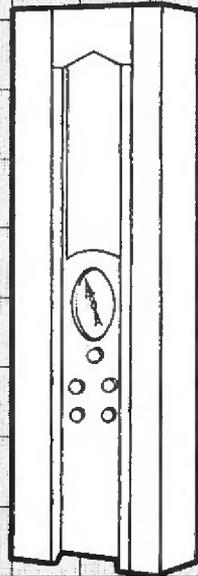
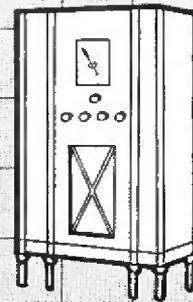
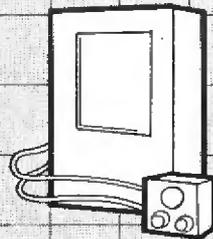
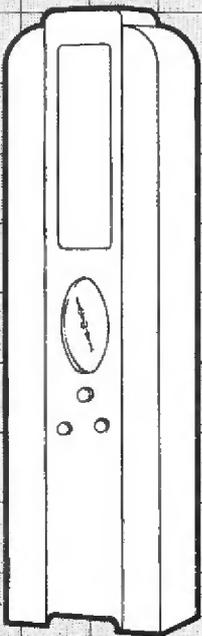
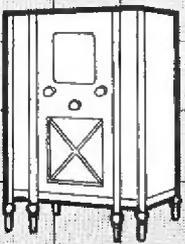
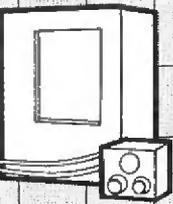
Table Models
2,204,000

Console Models
856,000

Console Models
1,100,000

Auto Radio
724,000

Auto Radio
780,000



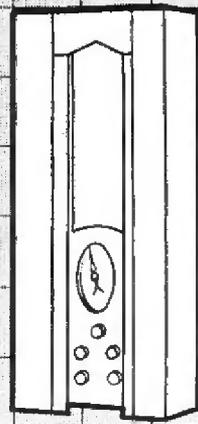
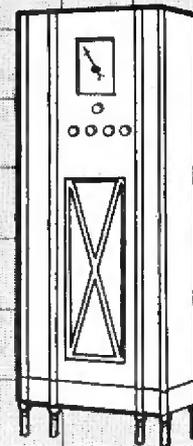
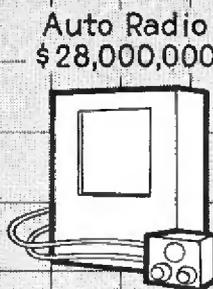
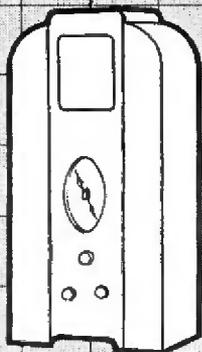
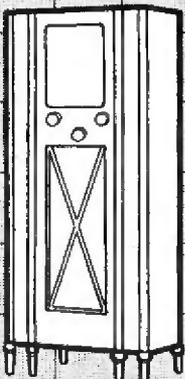
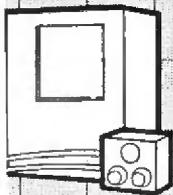
Consoles
\$52,212,000

Table Models
\$50,085,000

Auto Radio
\$28,598,000

Consoles
\$62,300,000

Table Models
\$60,580,000

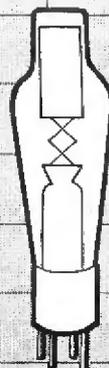
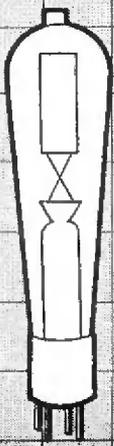
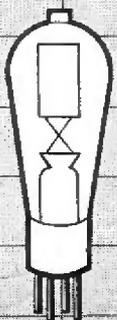


Replacement
32,769,000

Initial Equipment
26,550,000

Replacement
28,642,000

Initial Equipment
2,836,000



Total Retail Value \$56,600,000

Total Retail Value \$59,550,000

UNITS

DOLLARS - Retail less tubes

UNITS

Total Sales of All Radio Products at Retail

PRODUCT	1930	1931	1932	1933	1934
RADIO RECEIVERS*					
Table Models.....	1,130,400	1,800,000	1,900,000	2,226,000	2,204,000
	\$56,520,000	\$63,000,000	\$57,500,000	\$50,085,000	\$60,580,000
Consoles.....	2,663,400	1,512,000	577,000	856,000	1,100,000
	\$272,678,000	\$143,100,000	\$60,210,000	\$52,216,000	\$62,300,000
Motor Car Sets.....	34,000	108,000	143,000	724,000	780,000
	\$3,000,000	\$5,940,000	\$7,150,000	\$28,598,000	\$28,000,000
TUBES					
At Retail.....	24,000,000	28,500,000	29,500,000	32,769,000	28,642,000
To Set Makers.....	28,000,000	25,000,000	14,800,000	22,836,000	26,550,000
Total Retail Value..	\$119,600,000	\$69,550,000	\$48,730,000	\$56,599,000	\$59,548,000
BATTERIES					
Dry, Air Cell, Storage	\$23,514,000	\$14,100,000	\$11,000,000	\$10,400,000	\$9,200,000
ACCESSORIES.....					
	\$15,120,000	\$7,580,000	\$4,700,000	\$6,200,000	\$7,000,000
PARTS					
Sold to Consumer...	\$6,000,000	\$6,000,000	\$6,900,000	\$8,500,000	\$9,000,000
GRAND TOTAL.....	\$496,432,000	\$309,270,000	\$196,190,000	\$212,598,000	\$235,628,000

*At retail prices. SETS ARE PRICED LESS TUBES. Because of the advisability of separately tabulating all tube sales, these figures do NOT include the retail value of tubes in sets.

Permission to quote any of the statistics is granted only if credit is given to "Radio Retailing."

4,696,000 SETS Manufactured Last Year

Unit Volume Eclipses All Previous Records.

4,084,000 Sold in U. S.—612,000 Exported

AIDED and abetted by foreign shipments in excess of 600,000 sets, American manufacturers hung up an all-time high figure of 4,696,000 radio receivers made and sold during 1934.

The retail dollars value of sets sold for domestic use last year (4,084,000)—including an average of 6.5 tubes per set, at \$1.30 per tube—was \$185,390,000. This represents an average consumer selling price per set (console, table and auto) of \$45.40. Total retail dollar volume of all radio products sold by the retailer during 1934 was \$235,628,000, a healthy increase of \$23,000,000 over 1933.

The average retail value of table models (with tubes) was \$34.65—most encouraging. Average retail unit selling price of consoles was \$67.04 and of motor car sets, \$43.05. Battery operated radios approximated 280,000 units.

Of special interest to the entire trade are the tables in this issue showing the sale of radio sets last year by states, in numbers and percentages, for replacement purposes and to those buying their first receiver. Also the total number of sets in use, by states.

Note—thanks to all-wave—that 2.1 home receivers were sold to families already having a radio to every set sold to a "new" user. This high ratio must be exceeded in '35 if dealers would maintain their last year's sales volume. Hence the constant and imperative need for new ideas from the set architects and new merchandising methods by retailers.

According to Ralph H. Langley, consulting engineer, New York City, 1934 witnessed the amazing total of 1,603 different models of receivers announced by 110 set makers. Of these 93 per cent were superhets and 7 per cent t.r.f. In 1931 the ratio was approximately fifty-fifty.

Domestic Tube Sales					
PURPOSE	1930	1931	1932	1933	1934
REPLACEMENT.....	25,000,000	27,000,000	29,500,000	32,769,000	28,642,000
TO MFRS.....	27,000,000	26,500,000	14,800,000	22,836,000	26,550,000
TOTAL.....	52,000,000	53,500,000	44,300,000	55,605,000	55,192,000
DOLLAR VALUE..... (Retail)	\$119,600,000	\$69,550,000	\$48,730,000	\$56,599,000	\$59,548,000

Total TUBE Sales Reach 64,882,000

Total Retail Value (with tubes)—\$200,390,000

Retail Value \$70,156,000

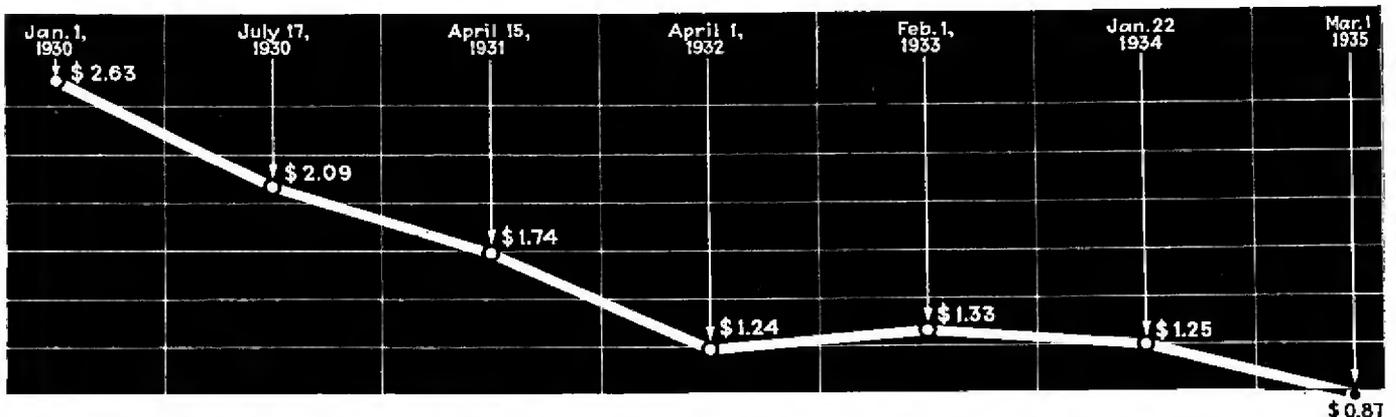
THE figures in the above head include tubes exported—9,690,000—valued at \$10,608,000. Domestic sales totaled 55,192,000; value, \$59,548,000, or an average retail price per tube, including those in sets, of \$1.08.

The poor showing in replacement sales—but 28,642,000 tubes were sold at retail last year—probably is due to two factors: the 1934 price, per average replacement tube type, was only 87 cents list,* hence the profit incentive to push tubes never has been less. Second, in 1933—an economy year—people bought tubes to keep their old sets running; last year they bought the new, all-wave models.

But here's a ray of sunshine! The average retail value of tubes sold for use in the 1934-35 receivers was \$1.30—as against this 87-cent counter price above mentioned. This means that, within the next two years, replacement demand will be for these higher-priced, multi-purpose types. Hence, barring further reductions in prevailing list prices, the average sales volume per 100 tubes sold at retail should jump 20 to 30 per cent.

**The computations whereby "Radio Retailing" arrived at this figure were made in conjunction with a very prominent tube concern. Due allowance was granted for the sale of approximately 13,000,000 "branded" tubes at less than established list prices. Weighed also was the quantity sales in the various types.*

What Has Happened To Tube Prices Since 1930



The above curve was obtained by averaging the current list prices of the tubes in replacement demand during each of the periods indicated, making due allowance for the relative volume sales of each type

Number and Value of Automobile Radio Sets Sold

	1930	1931	1932	1933	1934
NUMBER*	34,000	108,000	143,000	724,000	780,000
RETAIL VALUE†	\$3,000,000	\$5,940,000	\$7,150,000	\$28,598,000	\$28,000,000

*Sold to car owners or on contract between set and auto manufacturers.

†Does not include accessories, tubes or installation charges.

AS OF January 1, 1935, passenger car registrations totaled 21,505,000. 2,400,000 passenger cars were sold during 1934. Of the 780,000 auto-radio sets sold last year it is estimated that 350,000 were installed in 1934 model cars. There are now approximately 1,800,-

000 auto-radio sets in use or a market saturation of 9.3%. Of the 19,500,000 passenger cars now on the road—without radio receiver facilities—it is a fair statement that one-half of these automobile owners (9,750,000) constitute excellent prospects for a car set this season.

EXPORTS 54% AHEAD OF '33

Exceed by \$1,723,083 Former (1930) All-Time High Record—613,000 Sets Shipped Abroad—

A new all-time record for exports of radio receiving equipment from the United States was recorded in the calendar year, 1934, when sales abroad were valued at \$23,766,629 compared with \$15,382,306 in 1933, an increase of \$8,384,323, or 54 percent, according to U. S. Department of Commerce. Overseas sales of radio equipment during the year exceeded by \$1,723,083 the former record sales of 1930.

The Dollar Value Story

Item	1934	1933	Gain
Sets	\$15,338,143	\$9,323,535	65%
Tubes	3,210,729	2,623,261	22%
Components ...	4,358,350	2,783,730	56%
Accessories	859,407	651,780	32%

At declared value. Tubes in sets not included in Item 2.

During the past few years the average unit value of radio receiving sets sold abroad from the U. S. has steadily decreased until 1933 when the value was recorded at \$18. This decrease has been occasioned by the increasing popularity of small receiving sets in foreign markets. All-wave sets are credited with the increase in 1934 to \$25.

RECAPITULATION

No. Families in U. S.	30,919,000
No. of Radio-Homes in U. S.	21,456,000
<i>Twice as many radio-homes as telephone-homes</i>	
Per Cent Ownership Saturation	69.4
Total Sets Sold in U. S. Last Year.	4,084,000
<i>Includes 780,000 motor car sets</i>	
No. Homes Owning Two or More Sets	2,296,000
Replacement Sales, 1934.	2,250,000
<i>or 68.1 per cent</i>	
"Non-Radio Home" Sales, 1934.	1,054,000
<i>or 31.9 per cent</i>	
No. of Autos with Radios in U. S.	1,800,000
Percentage of Set Sales Other Than to Families, 1934.	21%

Radio Ownership by Size of Community

CITIES OVER 250,000	CITIES OF 25,000 to 250,000	CITIES OF 1,000 to 25,000	TOWNS UNDER 1,000	RURAL FARMS	U. S. TOTAL
93.4%	91.7%	88.2%	76.8%	33.9%	69.4%

RADIO RETAILING'S STATISTICS OBTAINED FROM AUTHENTIC SOURCES

Annually, since 1925, RADIO RETAILING has collected and published comprehensive statistics of the industry it serves. Recognizing the care and thoroughness with which these compilations are conducted, the industry has long accepted them as official.

Because the manufacturers' individual records are not available until February, this authentic sales picture must necessarily appear in our March issue. Furthermore, all totals are checked with such

partial records as the licensee reports to the Radio Corporation of America and the Government excise tax returns. These sources are not in a position to release their figures prior to the middle of February. It is obvious, therefore, that any earlier statements must necessarily be estimates.

All statistics are copyrighted by the McGraw-Hill Publishing Company, Inc., and may be quoted only if permission to do so has been obtained from RADIO RETAILING.

SALE OF RADIOS BY STATES, 1934

	NO. OF RADIO SETS SOLD IN 1934	NO. AND % SOLD AS REPLACEMENTS		NO. AND % SOLD TO NON-RADIO HOMES	
ALABAMA	25,450	14,175	55.7%	11,275	44.3%
ARIZONA	6,600	4,225	64.0%	2,375	36.0%
ARKANSAS	18,500	8,160	44.1%	10,340	55.9%
CALIFORNIA	186,350	135,300	72.6%	51,050	27.4%
COLORADO	34,030	18,500	54.4%	15,530	45.6%
CONN.	57,500	35,500	61.8%	22,000	38.2%
DELAWARE	6,950	5,210	75.0%	1,740	25.0%
DIST. of COL.	20,500	16,700	81.4%	3,800	18.6%
FLORIDA	40,650	23,580	58.0%	17,070	42.0%
GEORGIA	43,900	16,600	37.8%	27,300	62.2%
IDAHO	11,890	6,650	55.9%	5,240	44.1%
ILLINOIS	210,100	150,800	71.8%	59,300	28.2%
INDIANA	88,200	57,700	65.4%	30,500	34.6%
IOWA	54,200	43,250	79.8%	10,950	20.2%
KANSAS	30,400	20,950	68.9%	9,450	31.1%
KENTUCKY	40,650	21,700	53.4%	18,950	46.6%
LOUISIANA	37,350	18,675	50.0%	18,675	50.0%
MAINE	25,450	19,100	75.1%	6,350	24.9%
MARYLAND	50,800	30,000	59.2%	20,800	40.8%
MASS.	162,500	117,000	72.0%	45,500	28.0%
MICHIGAN	118,600	88,000	74.2%	30,600	25.8%
MINNESOTA	64,400	44,560	69.2%	19,840	30.8%
MISSISSIPPI	13,550	2,030	15.0%	11,520	85.0%
MISSOURI	118,600	88,240	74.4%	30,360	25.6%
MONTANA	10,250	7,600	74.2%	2,650	25.8%
NEBRASKA	33,700	16,000	47.5%	17,700	52.5%
NEVADA	3,300	1,750	52.8%	1,550	47.2%
NEW HAMP.	16,850	12,640	75.0%	4,210	25.0%
NEW JERSEY	152,300	121,300	79.7%	31,000	20.3%
NEW MEXICO	4,630	3,220	69.5%	1,410	30.5%
NEW YORK	508,500	379,300	74.6%	129,200	25.4%
NO. CAROLINA	37,300	15,480	41.5%	21,820	58.5%
NO. DAKOTA	11,900	9,380	78.8%	2,520	21.2%
OHIO	220,000	156,000	70.9%	64,000	29.1%
OKLAHOMA	37,350	18,900	50.6%	18,450	49.4%
OREGON	34,000	23,300	68.6%	10,700	31.4%
PENN.	305,000	210,000	68.9%	95,000	31.1%
RHODE ISL.	30,400	21,900	72.0%	8,500	28.0%
SO. CAROLINA	15,200	8,160	53.7%	7,040	46.3%
SO. DAKOTA	10,900	8,175	75.0%	2,725	25.0%
TENNESSEE	54,200	30,350	56.0%	23,850	44.0%
TEXAS	108,400	63,500	58.6%	44,900	41.4%
UTAH	15,200	7,325	48.2%	7,875	51.8%
VERMONT	10,250	6,000	58.6%	4,250	41.4%
VIRGINIA	43,900	26,340	60.0%	17,560	40.0%
WASHINGTON	57,500	39,500	68.7%	18,000	31.3%
WEST VA.	34,000	21,250	62.5%	12,750	37.5%
WISCONSIN	77,900	53,830	69.1%	24,070	30.9%
WYOMING	3,950	2,765	70.0%	1,185	30.0%
TOTAL	3,304,000	2,250,570	68.1%	1,053,430	31.9%

The above tabulation is the result of an extensive survey, just concluded, conducted jointly by "Radio Retailing" in cooperation with the Columbia Broadcasting System and the National Broadcasting Company.

Weighted averages were based on the following factors: Manufacturers' shipments of sets to jobbers, number of wired homes, retail buying power. The sales lessons to be deduced are obvious.

21,456,000 HOMES NOW HAVE SETS

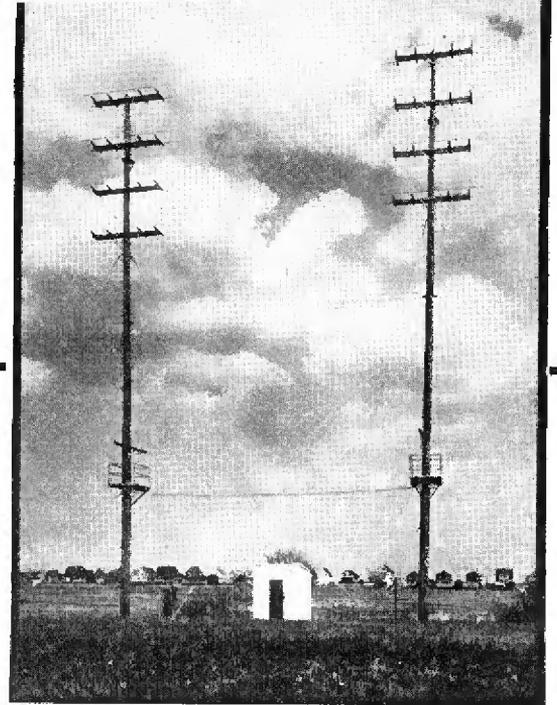
	POPULATION	FAMILIES	RADIO HOMES	% OWNERSHIP
ALABAMA	2,710,000	602,200	216,979	36.0%
ARIZONA	457,000	111,500	53,518	48.0%
ARKANSAS	1,876,000	446,700	122,989	27.5%
CALIFORNIA	6,158,000	1,759,400	1,369,365	77.8%
COLORADO	1,056,000	270,800	186,598	68.9%
CONN.	1,655,000	403,700	339,845	84.2%
DELAWARE	242,000	60,500	45,898	75.9%
DIST. of COL.	497,000	127,400	121,787	95.6%
FLORIDA	1,575,000	403,800	200,674	49.7%
GEORGIA	2,911,000	661,600	260,011	39.3%
IDAHO	448,000	109,300	74,284	68.0%
ILLINOIS	7,876,000	2,019,500	1,647,283	81.6%
INDIANA	3,304,000	869,500	597,696	68.7%
IOWA	2,485,000	637,200	459,988	72.2%
KANSAS	1,905,000	488,500	319,714	65.4%
KENTUCKY	2,657,000	617,900	300,877	48.7%
LOUISIANA	2,166,000	503,700	258,420	51.3%
MAINE	804,000	201,000	136,840	68.1%
MARYLAND	1,671,000	397,900	318,877	80.1%
MASS.	4,335,000	1,057,300	903,467	85.5%
MICHIGAN	5,093,000	1,242,200	919,946	74.1%
MINNESOTA	2,602,000	619,500	441,164	71.2%
MISSISSIPPI	2,057,000	478,400	113,989	23.8%
MISSOURI	3,678,000	943,300	649,040	68.8%
MONTANA	538,000	137,900	86,011	62.4%
NEBRASKA	1,395,000	348,700	244,503	70.1%
NEVADA	94,000	26,900	16,370	60.9%
NEW HAMP.	470,000	120,500	94,186	78.2%
NEW JERSEY	4,231,000	1,032,000	895,884	86.8%
NEW MEXICO	437,000	101,600	43,394	42.7%
NEW YORK	13,059,000	3,264,700	2,928,870	89.7%
NO. CAROLINA	3,301,000	673,700	266,924	39.6%
NO. DAKOTA	688,000	146,400	84,138	57.5%
OHIO	6,836,000	1,752,800	1,336,547	76.3%
OKLAHOMA	2,475,000	589,300	291,595	49.5%
OREGON	990,000	275,000	211,103	76.8%
PENN.	9,826,000	2,285,100	1,913,349	83.7%
RHODE ISL.	705,000	171,900	148,961	86.7%
SO. CAROLINA	1,750,000	372,300	142,706	38.3%
SO. DAKOTA	705,000	164,000	103,342	63.0%
TENNESSEE	2,676,000	622,300	312,491	50.2%
TEXAS	6,073,000	1,445,900	733,128	50.7%
UTAH	520,000	118,200	84,293	71.3%
VERMONT	361,000	90,300	61,274	67.9%
VIRGINIA	2,446,000	531,700	301,894	56.8%
WASHINGTON	1,608,000	434,600	333,236	76.7%
WEST VA.	1,786,000	388,300	239,227	61.6%
WISCONSIN	3,005,000	732,900	489,602	66.8%
WYOMING	232,000	59,500	33,522	56.3%
TOTAL	126,425,000	30,919,300	21,455,799	69.4%

The radio industry is indebted to the Columbia Broadcasting System for its cooperation with this magazine in compiling the above, basic tabulation of total set saturation by states.

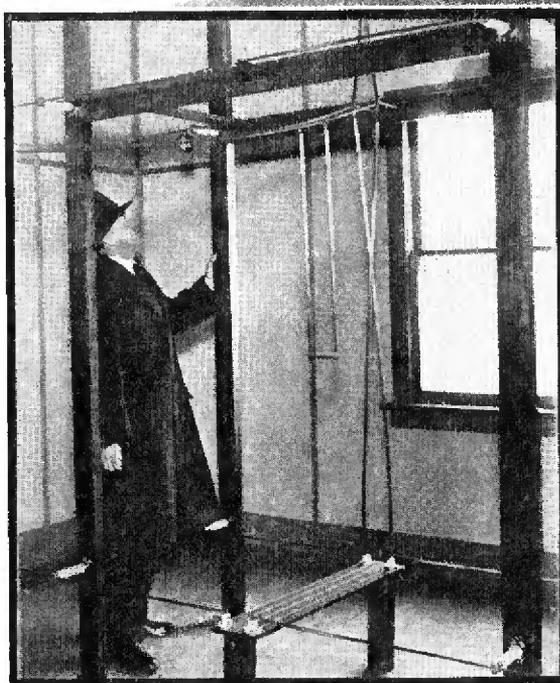
It is the result of over 120,000 personal field interviews. Note that 69.4 per cent of all homes now are equipped for radio reception.

Latest Uses of ULTRA-HIGH FREQUENCY RADIO

ARMY MANEUVERS are aided by portable transmitter-receivers. Here is an RCA-equipped cavalryman ready to take the field



LANDING BEAM equipment installed by the Department of Commerce at Newark Airport for experimental use permits a plane pilot flying blind under a cockpit hood to set his wheels down without a crash simply by watching instrument panel indicators. Picture shows part of the antenna system which emits both a directive and landing beam

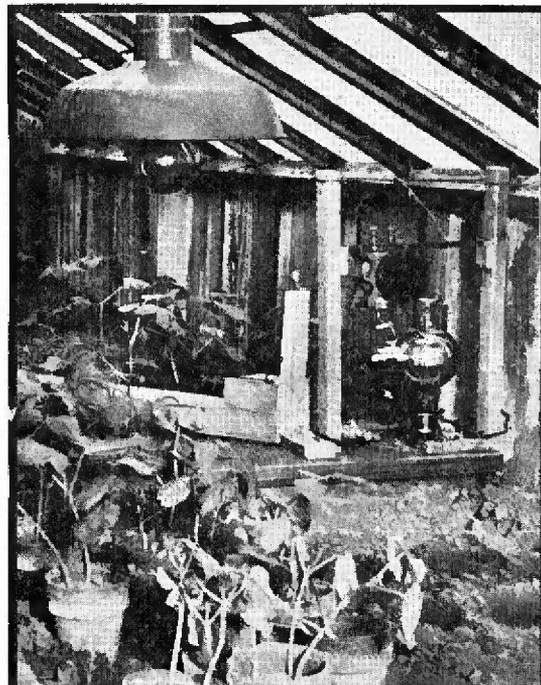


TELEPHONE SERVICE between Provincetown, Massachusetts, and several points on the "Cape" difficult to reach by land-line is maintained by the Bell System through a radiophone link. Here are the directional ultra-high frequency receiving and transmitting antenna arrays. The equipment is not attended, works automatically



DIRECTION FINDER developed by Lear Developments, Inc., for use on both aircraft and ships. This device works on signals in the regular broadcast band and from 3,000 to 6,200 kc. so is not truly ultra-high frequency. It is, however, a new development in shortwave equipment

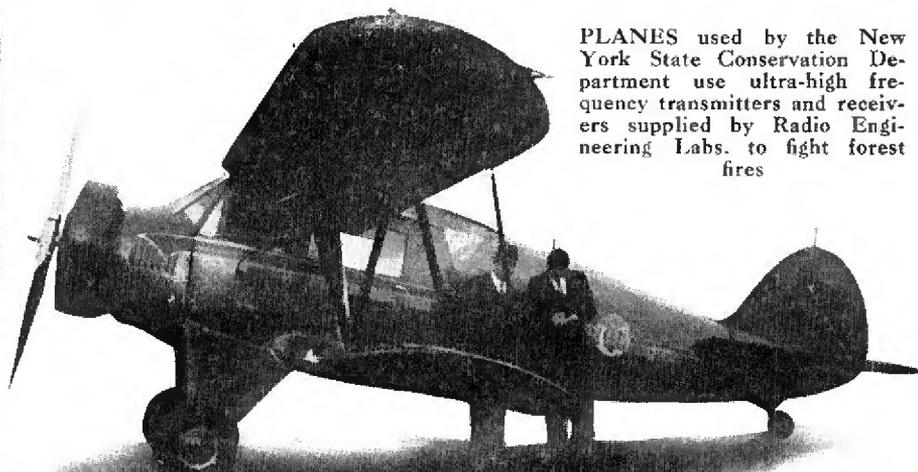
INSECT EXTERMINATION is possible through the use of ultra-high frequency currents. Although not yet practicable on a commercial basis, the idea is reported as perfectly possible by the New Jersey State Agricultural Experimental Station at Rutgers, now conducting experiments





AMATEUR TRANSCEIVER made by Gross Radio operated atop the McGraw-Hill Building in New York contacts Manhattan and New Jersey "hams" on 5-meters. Many units of this type are already being marketed by radio dealers. (Empire State Tower, from which experimental television signals are transmitted on 7-meters, in background)

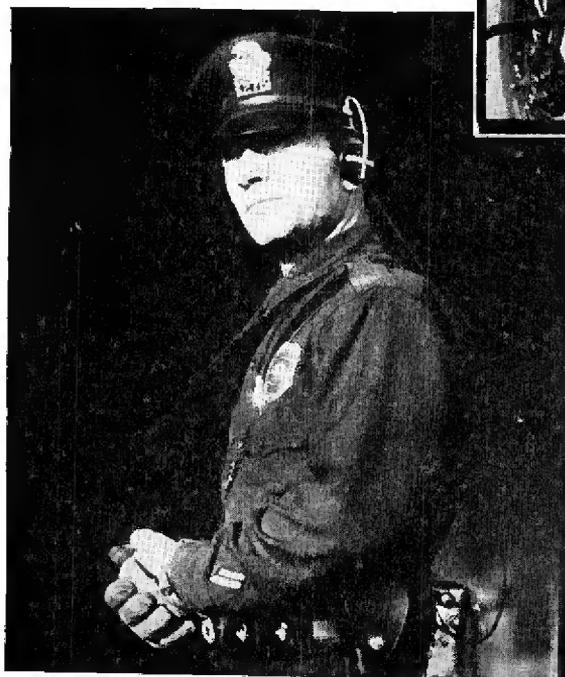
Radio dealers will eventually feel the effect of these newly developed services, furnishing replacement tubes and parts, if not original equipment



PLANES used by the New York State Conservation Department use ultra-high frequency transmitters and receivers supplied by Radio Engineering Labs. to fight forest fires



SPEEDCOP radio is now in regular use out in Pasadena, California. Here's officer Arthur O. Boyd getting instructions from headquarters. With the growing popularity of ultra-shortwaves it is quite possible that motorcycle patrolmen as well as those driving cars may eventually be equipped with transmitters, permitting them to talk back to the base station and also to brother officers



COPS may soon be in as close touch with headquarters as their flivver-riding brothers. Here's a "one-man" receiver being tried out for use by pavement-pounding patrolmen. New and extremely small, light tubes, batteries and component parts, incidentally, are being brought out and it is probable that "one-man" receiving sets for the broadcast band may shortly become popular

Spring Sales



CASTOR OIL FOR THE WINNER

During a local celebration, Simpson's Radio Shack, Paterson, N. J., sponsored a race between youngsters, offering a mammoth cake to the loser and a bottle of castor oil to the winner. The race convulsed the spectators because each youngster did his best to lose. In reporting the celebration this race received a headline and considerable space in the news columns with mention of the sponsor.

Experience has made newspaper editors hard-boiled on free publicity. They want to sell their white space the same as the radio retailer wants to sell radios. However, give your local editor hot news loaded with reader interest and tied to your business in one way or another and he will give you a free ad in his news columns as often as you ring the editorial bell.

CHEAP AND EFFECTIVE



Radio showrooms, we must admit, are stereotype in appearance. They look as alike as two peas in a pod. So whenever we run across a novel furnishing idea it goes into the paper for the edification of readers who want to do something about the situation.

Here's the demonstration room of the Poole Electric Company of Seattle, Washington. The furniture is roughed out of logs and the wall decorations make the place look like a trading post in the days of the "Pony Express."

One man's meat is often another's poison, so the idea may not click everywhere, but its sponsor claims that newcomers to the store seem to be less "jittery" as they

are immediately interested by its appearance. This makes it easier to get acquainted and put over a sale.

It seems to us, also, that the sets, with their modern cabinets, stand out beautifully by contrast with the Buffalo-Bill table and chairs and that the store fixtures thus distract less attention from its wares than the average.

ONE FOR THE RURAL DEALER

The Brandeis Stores of Omaha say this window is still talked about in town, despite the fact that it was used many months ago: On a raised dais in the center of a 20 x 10 ft. window six radios were placed. From the foot of each set to the glass were stacked sacks of onions, potatoes, cabbage and carrots, each sack bearing the price of the product it contained.

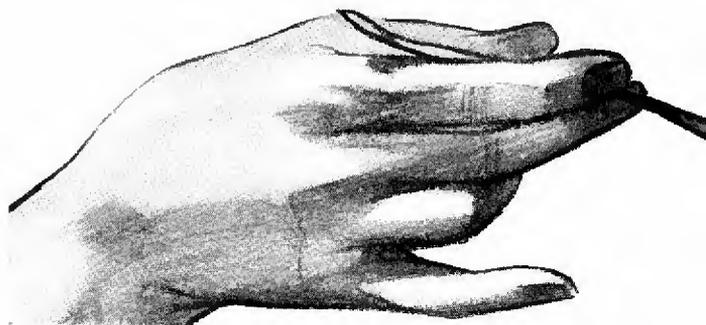
The sets bore price tags too, so the connection was obvious. "A radio costs only a few bags of potatoes."

Don't get us wrong. Brandeis did *not* trade sets for cabbages. It simply occurred to this firm that people in the farming area had plenty of produce and darn few greenbacks and that the display would reduce the "first impression" cost of owning a set.

SETLESS DEMONSTRATION ROOM

The average visitor to the Prest & Dean Radio Company's store in Long Beach, Calif., would not observe that there were any provisions for a radio customer to listen to a set in the quietude of a separate room. But there is—a beautiful room furnished with rugs and upholstered furniture and illuminated by subdued light—but devoid of sets. It is connected with the store by a narrow door which appears to be merely a panel in the wall. If a customer wants to hear a certain receiver, it is taken into the room, hooked up and demonstrated.

A salesman explained the reason for this:



Tonic



"Some people can afford expensive sets, others can't. It is to our advantage that our customers buy what they can afford when they are buying on contract. And it is also to our advantage that they be satisfied with what they purchase. If we had several sets in this room, he naturally would want to compare them and might be disappointed in the set he was contemplating.

"Therefore we help the prospect choose from the floor a display model that is within his price range. If he wants to hear it in an environment similar to his home, we take the set into this room.

"On the other hand, if we know the prospect can afford a more expensive set, we take a better one into the room and compare it to the set he is considering. Quite frequently we can build up sales in this manner. We have a little hand truck for moving the larger models."

THEY'VE GOT TO WORK TOGETHER

Frank Krasa, radio manager for Altenburg's of Elizabeth, N. J., holds four outside salesmen through lean times by a method new to us. He keeps two just canvassing. The others follow-up and close all sales.

All four receive moderate weekly salaries and 5 per cent commission. The "closers" must split all commissions with the canvassers! All four think the plan ok.

HATS OR HARDWARE?

Window trim ideas that tie in with some local "big-shot" topic are particularly effective. Those described in the following paragraphs probably won't suit your individual needs but they should suggest similar stunts:

When the Japanese beetle was ravishing New Jersey's crops and rigid inspection was being enforced, even upon motorists entering the state, Tuttle Brothers of Westfield displayed specimens of the beetles, pupae and local growth affected by these pests. Explanatory placards told the story of the beetles from point of origin to methods of extermination. This information was procured from the government at no cost. The window had pecks of news value as it was built around some-

thing which was uppermost in the public mind. The local newspaper even photographed the window and ran it on the front page.

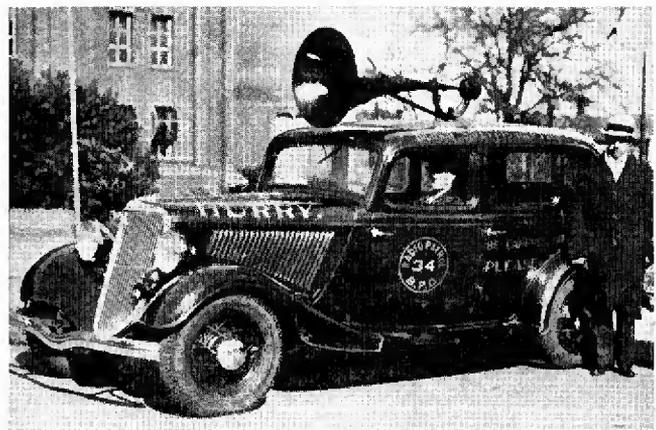
The Chamber of Commerce, Newark, New Jersey, offered prizes for the best millinery window displays some months ago. As a jest Arthur Nungesser, radio dealer, entered a window in which pots, pans, feather dusters, sink brushes, bronze scouring sponges, mops, scrub-pails, pastry brushes and the like were combined to simulate ladies' headgear. It was so novel that it won a prize in the millinery contest! And the local paper couldn't resist snapping it up for publication.

A window of this kind is not a bad idea for use elsewhere. With proper placards and a few *real* hats it could be used without a contest tie-in.

P.A. BUSINESS YOU CAN GET

A safety car known as the "Voice of Caution" and intended to be largely educational in its nature has been introduced by the police department of Birmingham, Ala., in an effort to cut down the number of traffic fatalities. The innovation consists of a regular patrol car equipped with a loud speaker which makes the rounds of the street intersections and reminds both pedestrians and motorists of the traffic rules.

An absent-minded jay walker may, for instance, get a polite but nevertheless firm "call down" from a stentorian voice which may be heard for a half mile. The voice is of course the police operator of the safety car. Pedestrians are also reminded to remain on the



sidewalk until the signal lights say "go." Motorists are told not to crash the crossing until the caution light turns to green.

Radio Dealers! Here's a type of police P.A. business right up your alley. No competition from outside "experts."

We Must Continue To . . .

Popularize Short Wave

By Arthur J. Green
President, International Short Wave Club

Chief Reason for 1934 Sales
Showing—Should Continue to
Promote This Business Stimulator

With the coming of spring, short wave reception conditions are improving. Use this idea as the basis for a special sales drive on all-wave sets during April.

Indicative of the extent to which listener interest may be aroused—and maintained—is the case of a fan in Litchfield, Conn., who tunes in his daily morning broadcast of *American news* happenings via *Daventry, England*.

IT IS generally admitted that the addition of short-wave tuning to broadcast receivers was largely responsible for good radio business during this past season. Replacement demand, and it is upon this that volume now almost wholly depends, would probably have been far from satisfactory without this feature. For broadcast sets designed as early as 1932 were not markedly inferior to present types from the standpoint of tone, selectivity, sensitivity, ease of control and cabinet appearance.

Shortwaves came along at the psychological moment, when a tangible feature was badly needed. And, in the writer's opinion, shortwaves will continue as the greatest single trade-in inducement throughout 1935.

Such being the case, it is important that the industry does not kill the goose that lays the golden eggs. We must make it our business to see that every purchaser of an extended-band or allwave receiver is completely satisfied. Actually this is far from the truth at the present writing. We recommend the following steps as a means of correcting this condition:

1. *An advertising agreement which will eliminate misunderstanding as to what may be expected of an allwave or extended-band receiver.*

2. *The adoption of noise-reducing antennas as standard equipment and a general step toward the reduction of man-made "static" in the shortwave spectrum.*

3. *Complete and up-to-date information on the wavelengths of shortwave stations and their operating schedules, as well as "how to tune" data, for every interested listener.*



At the present time almost any type of receiver with a tuning range extending outside the regular broadcast spectrum is advertised as an allwave, or short and long-wave, type. These terms are applied to sets which just cover the police and an upper amateur band, to receivers tuning down to 75 meters or thereabouts, to types skipping everything from the high frequency end of the broadcast band down to two popular foreign channels as well as to receivers giving complete coverage from the broadcast band right down to 15 meters.

The last mentioned is the type the average purchaser thinks he has bought—until he gets it home.

Advertising should state clearly just what kinds of

By
C. S. Gooch
Amarillo, Texas



No Metropolitan Monopoly

There are only 150,000 people within 100 miles of Amarillo. And the nearest chain broadcast station is 300 miles away. Not an ideal locale for auto-radio it seems. Yet Gooch has installed 1,008 sets and serviced five times this number

*Why I am
an*

AUTO-RADIO Specialist

The relationship between a specializing installation station and the dealer "farming out" work to such an organization is always delicate. The author, in this fine letter, tells how he sold his services to 11 stores, how he keeps them happy by rendering complete consumer satisfaction, so insuring prompt payments, repeat sales.

FOUR years ago our business was principally the servicing of home-radios. Today, 93 per cent of our revenue comes from the installation and repair of auto sets, principally for other dealers. We have placed 1,008 receivers in cars, averaging slightly more than two installations and nine service jobs per day for the past 12 months. Thus we are virtually auto-radio specialists.

The advantages of specialization, as we see them, are these: We have secured an increased quantity of service work due to the relative scarcity of experienced, capable competition, and volume is more evenly distributed over the entire year. Practically all of our work is paid for on a cash or 30-day basis, which eliminates credit costs and losses. And, owing to the comparative uniformity of sets and cars, we are able to handle our business on

a mass production basis which speeds up jobs and leaves a more substantial profit.

The advantages to the dealer for whom we make installations and do service work are equally obvious. All mechanical "grief" is transferred from his shoulders to ours, permitting him to put his entire effort on selling. The cost is no greater than if installations were "home rolled," due to the savings we effect through the handling of a large volume of business. And most dealers have learned through sad experience that a serviceman who has not had auto-radio experience, no matter how good he may be on home sets, usually jeopardizes sales.

Selling the Dealer

When approaching a dealer for installation and service work it is important that an organization such as ours give positive assurance that such a contract will not shunt repeat business to us rather than to the store "owning" the account. This we do by sticking exclusively to installation and repairs and avoiding the sale of sets. Installations are charged for on a flat-rate basis, including

(Please turn to page 33)

Television's Present Status

RECENT refinements in America in the construction of coaxial conductors and the announced intentions of the German and English governments to subsidize the commercial development of television again raises the question as to the present status of moving image transmission in the United States.

Many well informed radio engineers state that transmitting and receiving equipment is now sufficiently advanced—a la the cathode ray principle—to warrant the installation of such transmitters and the offering of television receivers for sale. As time passes it becomes more evident, however, that due to the limited range of effective sending and the cost of these stations and due also to the fact that the waveband and license-to-operate-for-profit situation is in the hands of the Federal Communications Commission, the active cooperation of the Government must be secured. In other words it would appear that an initial Government subsidy is necessary to provide for the simultaneous installation in important reception areas of television transmitters and their inter-connection by means of special circuits (coaxial) previously referred to. If the Government would then permit these stations to be privately operated and to sell sponsored time this project might be readily made self-supporting within a comparatively few years.

The matter of wire conductors which will pass a band of approximately 1,000 kc. has heretofore been one of



One of the more recent in experimental forms of coaxial conductors development in the Bell Telephone Laboratories

the problems to be solved. At the January meeting of the A.I.E.E. held in New York, Lloyd Espenschied, of the Bell Telephone Laboratories, presented a paper on the recent developments of co-axial lines. From this paper it would appear that it is now feasible for wired transmission of television signals which will give ample definition to the image provided such circuits are equipped with repeaters every fifty miles. This would make pos-

sible the tying together of many television stations and even "wired television" right to the customer's home.

As the chain transmission of television programs seems, at this writing, the only practical method of financing satisfactory programs the importance of this development may be readily realized.

It is noteworthy that transmission and reception results attained by RCA and others in the laboratory fully meet foreign standards. This applies also to the development of the iconoscope—an electric eye facilitating the pick-up of studio action and outdoor scenes.

In its annual report, just released, RCA states, however, that from the standpoint of public service there can be no



Recent type of German television receiver (Loewe) which will sell for the equivalent of \$300 or less

shortcuts to television. Technical, program and financial problems make impractical the immediate erection of a system of television on a nation-wide basis.

Inasmuch as practical television in America seems to be so closely related to Government aid and supervision, the following summary of the present status of the art in Great Britain and Germany is pertinent:

The British Broadcasting Corporation has received an exclusive license to establish and operate an ultra-short-wave television program in London. The cost of this service will be borne by the BBC and the British government from their respective shares of the proceeds of the wireless tax—approximately \$2.50 per year per user.

But it is in Germany that the most effective aid for television from governmental sources has been received. The Hitler administration is squarely behind the development of television as an outstanding German achievement and as an added means of disseminating Nazi propaganda. Millions of marks have been spent by the German government on television experiments. Daily television programs reputed to be of excellent quality are now being offered. The German government in December authorized the erection of television transmitters in Munich, Frankfurt and Cologne. German scientists are fully up to those in America in the development of co-axial cables. There are now five companies in Germany manufacturing television sets. The ultra-shortwave transmitter for pictures operates on a wave length of 6.70 meters. The picture has 180 lines or 40,000 picture elements. Transmission is at the rate of 25 pictures per second.

NEWS OF THE MONTH

IRSM ANNUAL CONVENTION AT HOTEL SHERMAN, CHICAGO, MAR. 22

The Third Annual Convention and Trade Show to be held Mar. 22, 23 and 24 at the Hotel Sherman, Chicago, under the auspices of the Institute of Radio Service Men promises to surpass any previous meetings of similar nature. Radio tradesmen throughout the Middle West are laying their plans to attend and participate. Just a month ahead of the opening date the last available space was absorbed—a record difficult to surpass.

The program will interest all classes of the radio trade. Technical lectures full of valuable information for service men, engineers, and amateurs are being prepared.

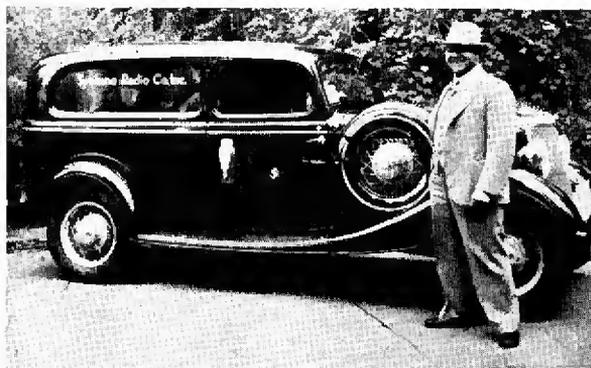
A meeting for the parts distributors has been scheduled for Saturday, Mar. 23. The agenda for the meeting is being prepared and will be announced directly to all parts distributors in the middle west. W. C. Braun, of Chicago, is chairman of this division.

A meeting of the Service Section of the Radio Manufacturers Association is also being arranged. This meeting will be conducted either by Ed. Hartley, chairman of the Service Section or Jerry Golten, chairman of the Western Division of the Section.

The IRSM announces that there will be no registration fee and that all participants in the radio industry regardless of their connection are cordially invited to be present throughout the entire three days or any part of it.

Hatry & Young Open Branch Store in New Haven, Conn.

Visible proof of the consistent growth enjoyed by Hatry & Young, prominent parts distributor of Hartford, Conn., is seen in the announcement that this firm has opened a branch in New Haven. Within the past 4 years, Hatry & Young has increased its Capitol City staff from 2 to 15 employees. Expansion of this company in Connecticut's leading commercial city is due in part to the successful operation of its Radio Wagon which has maintained a weekly schedule calling on all dealers and service men in central and southern Connecticut.



Wins With His Grin

Tonic for business is the smile of sales manager A. F. Horton, whose cheerful aggressiveness helped make 1934 a successful year of radio wholesaling for the Spokane Radio Co. Dealers and service men in the Northwest leap to the curb to meet him, 'tis said.

New A-R Antenna System to be Explained in Series of RCA Servicemen's Meetings

Another series of servicemen's meetings sponsored by the RCA Service Division in collaboration with RCA distributors, will be held during March and April until more than 150 points all over the country have been covered, according to service manager E. M. Hartley.

Following closely a successful series of servicemen's meetings on antenna systems, the new series will be devoted to an analysis of the newest RCA-Victor auto radio receivers.

Another interesting feature will be a description and display of a new automobile antenna system which RCA engineers have designed to meet the problems of providing noise-free reception in steel top automobiles. The auto receivers will be demonstrated and their circuits analyzed with the aid of the cathode ray oscillograph.

Nate Hast With Emerson

Nate Hast has been appointed eastern sales manager for the Emerson Radio and Phonograph Corp., New York City. Mr. Hast comes to his new position from the May Radio and Refrigeration Corp. Prior to that he was active in the Philco organization throughout New York State.

This veteran radio executive is already working on a comprehensive dealer and jobber sales campaign which will be directed primarily toward giving the new Emerson sets an early start in the East.



Just before Paul V. Galvin (right), president, Galvin Manufacturing Corp., went over the top with his talk to distributors

Galvin Looks to Radio Specialty Men For A-R Future

That the swing in the automobile radio setup is back to the specialty radio dealer was the opinion voiced at the Galvin Manufacturing Corporation distributor meeting in Chicago, February 14-15. About 165 distributors and service men were present.

Clean sales may be made by jewelers, by garages and through many other outlets, Paul V. Galvin, president, declared, but the heart of the situation is the radio service man who puts in the job. Consequently the company is making a special drive to school, to examine and to equip from 2,500 to 3,000 service men throughout the country. While the firms that employ these men will sell auto-radio they will draw on a number of outlets in the community for additional installations and service.

The policy of selling to distributors only will be continued, V. A. Irvine, in charge of advertising, stated. Even Goodyear and Goodrich must buy from local distributors. Twenty-four sheet billboard advertising will be used throughout the country this season as well as painted signs, he said.

Nine models were on display, featuring the Magic Eliminode special models made to fit Fords, Chevrolets and Plymouths. Service discussions were conducted by E. H. Wavering.

Donald H. Miller, for the past eight years in the Chicago area in charge of the advertising sales for *Radio Retailing* has been transferred to the McGraw-Hill home office in New York. Mr. Miller will represent this publication in a similar business capacity in the New York district.

Radio Show At Grand Central Palace, N. Y. Sept. 18-28

Announced as a "Review of Progress," with which there will be combined a "Pageant of Achievement," the National Electrical and Radio Exposition will be held this year in Grand Central Palace from Sept. 18 to 28, inclusive.

Sponsored by the Electrical Association of New York, Inc., the exposition will present, according to Clarence L. Law, president of the Association, "all that electrical science and industry have to offer in lighting, heating, refrigeration, air conditioning, oil burners, domestic and industrial appliances and the latest in invention and development in the field of radio."

Outstanding features of this year's exposition will be the graphic presentations of the latest products of inventive genius in radio and electrical fields; the "eye-opening" wonders that are so interesting and thrilling to the layman.

RMA Interference Campaign Launched March 8

A meeting of the recently formed Committee of the Radio Manufacturers Association was called by its chairman, Dr. Alfred Goldsmith, on March 8 at the Hotel New Yorker, New York. Representatives of leading electrical and radio organizations were present.

The increasing interest in shortwave reception and the advent of high fidelity receivers have brought man-made electrical interference particularly to the attention of the public. The use of ultra-shortwaves, for facsimile and television broadcasting, similarly require that all reasonable steps be taken to reduce electrical interference so as not to impede the growth of these important developments in the radio field.

Last week's meeting of this interference committee was devoted to the consideration of the following topics: Assembling infor-

mation on all known sources of radio interference; methods of measuring the susceptibility of radio sets to interference and methods of measuring electrical noise. Detailed methods for the elimination or reduction of interference also were discussed.

It is hoped to secure the cooperation of the electrical industry and associated groups in working out means for eliminating the future manufacture and sale of electrical devices which may cause radio interference.

RR NOMINATES for membership in its PRIME MOVERS CLUB



C. P. Cushway

What's a "prime mover"? It's a motivating force. In the genus homo it's an idea man—one who does things.

Such a chap is C. P. Cushway, sales manager since January, for the Thordarson Electric Mfg. Co., Chicago. Mr. Cushway was largely instrumental in introducing the "All Star" shortwave receiver kit in which eleven parts manufacturers are participating in a cooperative merchandising plan. His latest altruistic endeavor for the good of radio in general has been in the capacity of chairman of the Radio Sales Managers Club, with headquarters in Chicago. Its members meet monthly to discuss their managerial problems and the development of new merchandising methods.

Prior to his present connection with Thordarson, Mr. Cushway was departmental manager for the Belden Mfg. Co. He later was general sales and advertising manager for the All American Radio Corp. When this firm merged with the Wurlitzer interests he organized the Cushway Distributing Corp. of Chicago.

Within the past twelve months the Thordarson line has moved to a top position among the leading transformer manufacturers.

DEALER "HELPS"

Everything to help the dealer and serviceman sell tubes properly describes the latest presentation of merchandising aids offered by:

The National Union Radio Corp.
400 Madison Avenue,
New York City.

By the way, this tube outfit has just added the "Confidence" line of tube testers to its list of service shop equipment available for those that need 'em. They test more than 147 types of tubes in only four sockets without use of adapters. All parts of dual purpose tubes can be tested separately, both plates of full wave rectifiers can be tested independently and in addition to regular receiving type tubes, certain amateur transmitting and sound equipment tubes can also be tested. Obtainable on one of National Union's regular tube purchasing agreements.

"More Aggressive Merchandising in 1935" is the title of Motorola's latest sales aid offering. Write:
Galvin Mfg. Corp.
847 W. Harrison St.
Chicago, Ill.

A complete Manual of Auto-Radio Installation and Servicing—Lenz wires and cables—will be yours if you drop a card to:
Lenz Electric Mfg. Co.
1751 N. Western Ave.
Chicago, Ill.

This one will cost you 50 cents. It's worth \$5. Title—"250 Ideas for Increasing Retail Sales." Send half a dollar to:
Bureau of Business Information
University of Wisconsin
Madison, Wis.

A Pocket Trouble Shooter is the title of a mighty handy and unique quick-reference cardboard affair offered to *Radio Retailing's* subscribers by:

Raytheon Production Corp.,
30 East 42nd Street,
New York City

Mention *Radio Retailing* to get this free.

Your money back if not satisfied, is the offer of:

The Credit Press
901 Harvard St.
Rochester, N. Y.

for its book—"How to Collect Installment Accounts." The price is \$2. Looks like a meaty, usable job to us.

Two new catalogues (Nos. 128 and 129) containing much information on all types of condensers has been written for parts distributors, dealers and service men by:
Cornell-Dubilier Corp.,
4377 Bronx Boulevard,
New York City

B. F. Dulweber Dies

It is with regret that we announce the death of B. F. Dulweber, president of the Supreme Instruments Corporation, Greenwood, Mississippi. Mr. Dulweber passed away on Saturday, February 2, after a brief illness.

Congrats



L. S. K. Radio's "Radiotron" sales skyrocketed last month, earned an extra commission check. L. S. Kaptain receives a check from E. E. Hasselquist, manager of Fox Electric, while H. R. Johnson and P. W. Kaptain look on.

MANY CONVENTIONS HELD LAST MONTH

JUNE or January, it makes no difference to the convention hounds. Last month witnessed more than the usual run of manufacturer-jobber and jobber-dealer "pep" meetings. Attendance, in every instance, was large and enthusiastic—giving every indication of lots of sales push for the balance of the year.

Indicative of how sales managers are earning their keep these days, and how dealers and distributors are getting a fresh supply of sales ammunition, are the following affairs:

Midwest Grunow Company

Entertained 250 dealers at the President Hotel, Kansas City, Feb. 13. After the luncheon, President E. J. Goetz introduced the 1935 line of Grunow radios and refrigerators. Many of the bigwigs from Chicago were present. Divisional Manager H. T. Stockholm writes that the highlight surprise feature of the evening was a long distance address from Philadelphia, via telephone and loud speaker amplification, by Henry Bonfig, sales manager for General Households, who was conducting a similar meeting in the City of Brotherly Love.

Philadelphia Distributors, Inc.

Conducted a "first showing" of Stewart-Warner refrigerators, Mar. 5, at the Bellevue-Stratford. Featured was S-W's great Selling Contest offering \$20,000 in prizes.

Southwest Distributors

Brought its western Kansas dealers up to date when, Feb. 15, it presented the Grunow products at the Broadview Hotel, Wichita. Carol Willis and Arlie Siebert are doing an excellent job out there in the wide open spaces. Henry Bonfig again pulled his long distance telephone stunt, this time from Hartford, Conn.

Present in the flesh was William Grunow, president of General Household Utilities, at the Sidles-Duda-Meyer Co. meetings in Omaha, Feb. 20, and in Des Moines, Feb. 22.

Brown Supply Company

St. Louis staged its official presentation of the new Grunow's at the Chase Hotel, Feb. 11. Fred Wiebe wasn't a bit embarrassed in the presence of 200 dealers. As at Kansas City, Homer Kunkler and Al Burleigh, respectively, did the honors for the sales and engineering departments. The novel feature of this affair was the overflow meeting conducted in the evening for dealers and salesmen who were too busy selling sets to attend the afternoon session.

Tower Binford

"Billy" Burke was master of ceremonies at the get-together of 125 Crosley dealers. A business man by vocation he nevertheless "doubled" by incorporating a line of sparkling entertainment of his own selection and under his own direction. Fifteen girl ushers in Crosley uniforms gave atmosphere to the occasion.

Sparks-Withington

An excellent idea is credited to the sales executives of Sparks-Withington in holding an East Coast distributor convention

in New York City, Feb. 23. Jobbers from Maine to Virginia inspected the new models and had many opportunities to discuss their individual sales problems with the following home office representatives: Captain William Sparks, E. T. H. Hutchinson, Arthur Haugh, Guy Core and Howard Clark. "The biggest sales year throughout the East that Sparton has enjoyed since 1930," declared Capt. Sparks.

Philadelphia Motor Accessories

The volume of acceptances for the sales meeting of Sparton dealers in Philadelphia territory necessitated staging this event in the Ritz Carlton Hotel. Ed Hutchinson, general sales manager of Sparks-Withington, was the principal speaker.

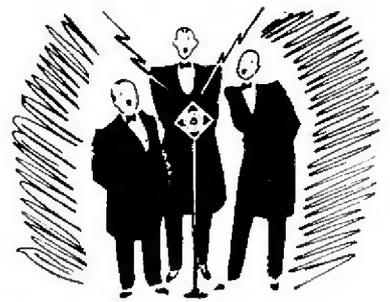
A. A. Schneiderhahn

Featured the personal appearance of A. Atwater Kent, Junior, and 17 other "captains of industry" according to the advance promotion sheet. Al Schneiderhahn pulled the biggest and best yet at the Hotel Fort Des Moines, Feb. 28. Governor of the Tall Corn State, Clyde Herring, and the Mayor of Des Moines did the heavy speech making at the banquet. We regret that space does not permit a complete review of one of the most elaborate and ingenious jobber-dealer conventions run off this year.

You Win, Zenith



Someone must have told dealer Levinson of Chicago about our weakness for kiddies. He "makes" RR with this shot of a Strathosphere—which ordinarily would be "fled"—by playing on our heartstrings, surrounding it with young Americans, Sophie Tucker . . . and the girl from the Chez Parce.



Suffice it that the dealers present got a head-full of sales ideas from the sales managers of the following companies: General Dry Batteries, Altorfer Bros., Atwater Kent and Leonard Refrigerator.

Erskine-Healy

A two-day open house at the Seneca Hotel, Rochester, N. Y., was held the fore part of February. This was in observance of its 15th anniversary, which was distinguished by the presence of 200 Crosley dealers who, believe it or not, were shown the new 1935 line of Shelvador refrigerators and Grosley radios. Vice-president Ray Healy states that he received more "spot" orders for the new Crosley line than during the entire month of February the year prior.

H. M. Tower Corporation

Celebrated moving into a bigger building in New Haven, Conn., with a house warming and display of new radios, refrigerators and washing machines. Three hundred dealers and their wives came from all over the state to inspect the new quarters as guests of President W. G. Miller. General Sales Manager David Newman acted as master of ceremonies. "Tower House" distributes American Bosch radio, Leonard refrigerators and "1900" washers.

E. E. Forbes & Sons Piano Co.

Over 150 Grunow dealers from northern and southern Alabama came in for the meeting held by Forbes in Birmingham, on Feb. 25. E. F. Lindgren, divisional sales manager, and Warren Funk, engineering department, represented the factory. Improved business conditions in their respective localities were reported by those present.

A-R Sets Under RWA Code

Automotive receiving sets sold by jobbers and dealers are subject to the supplemental code for radio wholesalers, according to an interpretation of NRA Divisional Administrator Brady. The ruling does not apply to manufacturers selling automotive sets as such manufacturers are subject to the electrical code. Although the Internal Revenue Bureau in administering the radio excise tax law has ruled, for taxation purposes, that automobile sets are automotive accessories, for NRA code purposes they are ruled to be radio rather than automotive products, at least when sold by distributors and dealers.

Why I Am an A-R Specialist

(Continued from page 28)

a 90-day work warranty and free-service period, and we have never found it necessary to add a commission for dealers referring work to us. They pay us by check at the end of each 30-day period. Consumers pay cash.

It is also important to supply virtually perfect installations and to make good without question for all defects within the guarantee period. We frequently replace an entire chassis, at our own expense, to insure complete consumer satisfaction. Thus the dealer has no trouble collecting time payments and the customer goes back to him for other merchandise. It is my opinion that the divorcing of installation and repair work from the organization handling the credit is a distinct business advantage. We keep a complete record of customers and their addresses, contact them periodically to make sure that the sets are performing satisfactorily as a protection to our dealer accounts.

Another thing that helps us in our relationship with dealers is the referring of much home set repair work to them, while they in turn send us auto-radio installation and service business. It is also frequently possible for us to pass along sales leads to our various retail accounts. This is a very tangible way of proving to them that we are not competing in the sale of sets.

Two men handle all of our work and because of the steadiness of this business they work along, month after month, with consequent increase in efficiency and lowering of operating costs.

Sees Bright Future

When we switched from home-radio service to auto-radio specialization four years ago we gambled that the specializing installation station idea would grow. Our hopes were fulfilled. It has become apparent that specialization insures good installations and even the manufacturers have definitely determined that auto-radio sales in any given territory are almost wholly dependent upon this theory. Furthermore, when a manufacturer's salesman calls upon a dealer to sell sets he finds his sales resistance infinitely lower where arrangements can be made to have a specialist take over all mechanical work.

We firmly believe that the future will be even brighter for men in our line and this is another reason why we intend to continue as specialists. Here is the probable future for auto-radio, as we see it: Most all makes of automobiles will eventually be adapted for one or more specific makes of receivers. Manufacturers of cars will work more closely with set designers. An increased number of sales will be made, undoubtedly, from car showrooms and installations will be so greatly simplified.

We feel certain, however, that the increase in the number of sets in use will swell our repair business to a point where we no longer are dependent upon installation contracts. It is quite probable that we will concern ourselves chiefly with repairs, five years hence. And it is also likely that set makers will tie up closely with specializing organizations, such as our own, upon which so much depends.

We confidently expect to see in the not too distant future, a definite group of installation and repair specializing stations from coast to coast, perhaps one to every 10,000 auto-radio owners. Probably no user will be more than 20 miles from a trouble shooter.

Popularize Shortwaves

(Continued from page 27)

sumer must be taught how and when and where to tune.

Receivers can be delivered with complete tuning instructions and general information relative to the best times to listen on certain wavelengths. Dealers should, and many do, supplement such instructions with their own "how to tune" demonstrations. Too much cannot be done in this direction, as failure of the user to bring in stations claimed in advertising gives shortwaves a black eye and puts the damper on sales obtained through customer recommendations.

Stations change their frequencies and operating schedules quite often. No log, however perfect it may be today, can be of much value a few short months from now. This is the reason why the International Short Wave Club of East Liverpool, Ohio, was formed—to provide a continuously corrected schedule of shortwave stations all over the world, data being compiled by members and then disseminated to members through the Club's own publication.

A considerable number of dealers have found that it pays to provide purchasers of allwave sets with copies of such publications, finding it good sales insurance. Obviously, a user condemns his set if a station tuned in regularly several times suddenly disappears from the dial. And it has, more than likely, simply changed its frequency or operating time.

Shortwaves, we repeat, is the greatest single selling point embodied in modern receivers. It is essential that the industry preserve the value of this feature by seeing to it that the consumer understands perfectly what he is buying, gets it equipped with an antenna that can do the set justice in noisy locations and then keeps the purchaser informed as to station schedules.

Every radio dealer should be a specialist in short wave tuning. Here are some sources from which up-to-date information may be obtained:

SHORT WAVE RECEPTION NEWS

Issued fortnightly by the Chicago Short Wave Radio Club, Box 240, Chicago, Ill.

RADIO MAP AND LOGS

United American Bosch Corp. Springfield, Mass.

RADIO LOG

National Union Radio Corp. 400 Madison Ave., New York City

HAYNES RADIO LOG
161 West Harrison Street, Chicago, Ill.

INTERNATIONAL SHORT WAVE CLUB
East Liverpool, Ohio.

RADIO ATLAS
Philco Radio & Tel. Co. Philadelphia, Pa.

RADIO TOURS
RCA Radiotron Co., Inc. Camden, N. J.

FROM AN OLD "DEFOREST" CATALOG

Type RJ4 Improved Audion Detector Tube	\$18.00
Type RJ5 Audion Detector Tube	25.00
Type PJ1 Single Step Audion Amplifier	65.00
Combination Audion and Single Step Amplifier	110.00
Audion Time Receiver, less Accessories	75.00
Special Loud Speaker Telephone with Horn	50.00
Type RJ Variometer	20.00

Write Your Own Moral

NEW MERCHANDISE

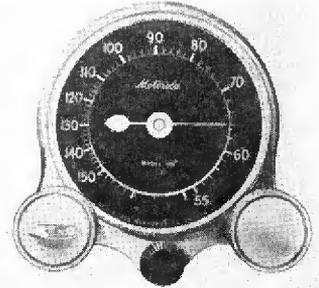


Stewart-Warner Refrigerators

The "Safety-Zone" refrigerators of the Stewart-Warner Corp., 1326 Diversey Blvd., Chicago, get their name from a combination of durable construction, double sealed insulation, permanent seal of cabinets, constant circulation of air, new type "Slo-Cycle" principle and super-sensitive temperature control. As a result of this Safety-Zone, temperatures are kept within 42 and 45°.

There are seven models ranging in size from 9.3 sq.ft. of shelf area to 13.4 sq.ft. of shelf area.

A cleverly designed accessory kit for those who desire special food storage facilities is also available. It consists of a hydrator drawer, a sliding wire basket and three porcelain dishes with covers to fit the basket.—*Radio Retailing*, March, 1935.

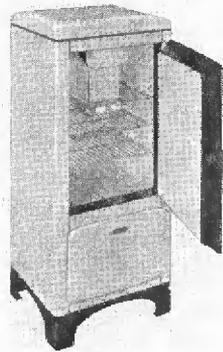


Galvin Model 100 Standard Control

Western Electric Airplane Radio

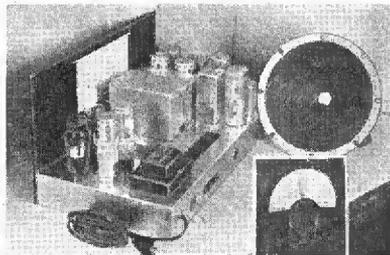
A set for the business man or sportsman aviator who flies his own plane and uses radio primarily to pick up weather reports and beacon signals is the new tiny "double duty" receiving set just put on the market by the Western Electric Co., 195 Broadway, New York City. It is about 7 1/4 in. square and weighs 11 lb. and not only tunes in on the 200 to 400 kc. band but also the broadcast band of 550 to 1,500 kc.

It is a 3-tube superheterodyne and is powerful enough for several listeners using earphones.—*Radio Retailing*, March, 1935.



Clough-Brengle "Standardized" Sound Amplifiers

By means of entirely new input and output circuits plus improved mixing designs and finally the employment of additional high gain stages, the engineers of the Clough Brengle Co., 1134 W. Austin Ave., Chicago, have evolved new "standardized" amplifiers so that only three models meet the needs of over 95% of all installations. Under this system, sound men can quickly secure a complete stock from their local jobber, obviating ordering from distant factories.—*Radio Retailing*, March, 1935.



Browning-35 with Tobe tuner. Insert shows dial

Browning-35 with Tobe Tuner

The new Browning-35 all-wave build-up set with Tobe tuner was designed by Glenn H. Browning, creator of the famous Browning-Drake circuit. Information on this new kit may be obtained from the Tobe Deutschmann Corp., Canton, Mass.

The tuner comes wired and adjusted ready to be set into the chassis with only seven connections. Below are some of the outstanding points of this Browning-35 receiver: triple tuned, double-band-pass, intermediates-link circuit, mechanical and electrical arrangement of tuner permitting maximum gain and efficiency, no plug-in coils, pre-selection by means of r.f. stage, seven tubes, antenna connections for doublet or straight antenna, frequency range 540 to 22,600 kc., four bands, and beat-frequency oscillator for C.W. reception. Everything is supplied in one container except tubes and speaker.—*Radio Retailing*, March, 1935.

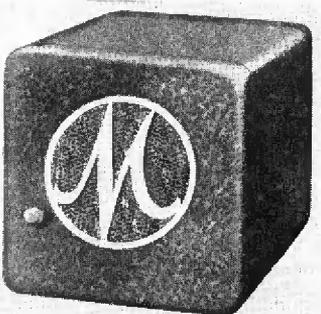
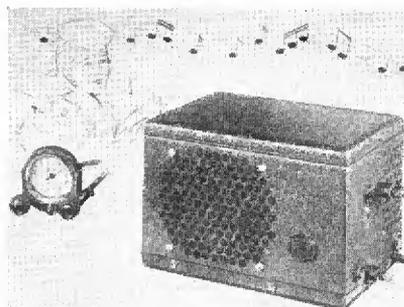
Carbon Brush

A recent automotive radio development of the Ohio Carbon Company, 13508 Berea Road, Lakewood, Ohio, is a carbon brush containing high-resistance material, designed for use on radio-equipped Ford V-8 cars. Because of the combined distributor-coil unit on this model it was not possible to install the customary resistance between the distributor and the coil. The new brush, however, fulfills the same function.—*Radio Retailing*, March, 1935.

Zenith Auto Radio 666

A new auto-radio set has just been added to the line of the Zenith Radio Corp., 3620 Iron St., Chicago, Ill.

It is known as Model 666 and is a 6-tube superheterodyne using 2-6D6, 6C6, 75, 42 and 84. Tuning range is from 535 to 1,600 kc. Speaker is a 6-in. dynamic and the overall dimensions are 9 1/2 x 6 1/2 x 6 1/2 in. The announcement states spark plug suppressors are unnecessary. \$49.95.—*Radio Retailing*, March, 1935.

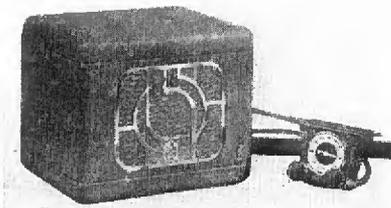


Galvin Auto-Radio Model 57

Motorola Antenna Capacity Bridge

For accurately testing all types of built-in automobile aeriels, the Galvin Mfg. Corp., 347 W. Harrison St., Chicago, has brought out an antenna capacity bridge. Range 0 to 10,000 micro-micro farads.

This capacity bridge is entirely self contained and is direct reading. It will test automobile aeriels for high resistance shorts, too much capacity to body, too small an area, or loose or open connections to lead-in. It will also test all small capacity paper and mica condensers. It operates on two flashlight cells. The net price is \$4.95.—*Radio Retailing*, March, 1935.



Delco Model 626

Delco Auto-Radios

Four new models of Delco auto-radio are now being distributed through the national organization of United Motors Service, 3044 W. Grand Boulevard, Detroit, Mich.

Through a development called "synchronizing" the new Delco may be placed in absolute and permanent synchronism with its antenna at all frequencies, minimizing dead spots and increasing volume. These sets are compact and smartly styled and may be quickly installed on or removed from any make of car. Special mounting plates are provided to harmonize with the instrument panel of each car.

Another feature is the universal control which provides custom-built control for installation in any car and in the location which best suits the wish of the purchaser. Every precaution has been taken to eliminate interference from the electrical equipment of the car.

Model 628 is a 6 tube set with 8 in. speaker and Model 627 is a 5 tube job—each of the two unit type. Model 626 is a 5 tube model with 6 in. speaker and Model 629 is designed for the moderately priced field. It has four tubes. The latter two are of single unit construction. All sets measure 7½x7½x8½ in. and tune from 540 to 1500 kc. Prices: \$42.95, \$49.95, \$57.50 and \$67.50.

United Motors is also distributing the new Delco "Flexo-Strip" under-car antenna for roadsters, touring models and for cars having a steel roof.—*Radio Retailing*, March, 1935.



Emerson Model 60

Emerson Models 60 and 280

Meeting a demand in many places for a high quality all-wave table set, Emerson Radio and Phonograph Corp., 111 Eighth Ave., New York City, is distributing a deluxe "round the world" receiver, Model 60. It is a 6 tube dual-wave superhet in a cathedral type cabinet, 19½ in. high with oversize speaker. \$59.50.

Model 280 is a battery table set covering the shortwave range of 5.7 to 15.5 mc and the broadcast range, 540-1700 kc. This is a 6 tube superhet with permanent magnet dynamic speaker. \$44.50.—*Radio Retailing*, March, 1935.

"Universal" Power Recorder

For cutting any type of material and for recording of all audible frequencies, the Universal Microphone Co., Ltd., Inglewood, Calif., announces a power recorder. The field coil is energized by 6 volts insuring a powerful magnetic field, eliminating lag in cutting and giving to records maximum brilliancy and full and clear reproduction. Furnished in 15, 50, 200 or 400 ohms. Price to the dealer \$29.40.—*Radio Retailing*, March, 1935.

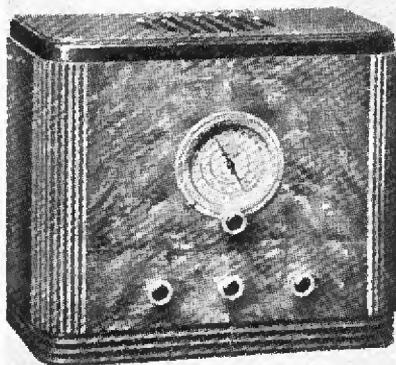
Pierce-Airo Line

A most complete series of table sets, consoles, radio-phonograph combinations and auto-radios is offered by Pierce-Airo, Inc., 510 Sixth Ave., New York City.

There are t.r.f. sets and superhets for a.c., a.c.-d.c., and battery operation. Some cover the broadcast band only, others get police and amateur calls but the majority have world wide range.

The auto-radios have 6 tubes and are of single unit construction.

The illustrated cabinet houses Models 503A, 504A, 500A and 601A.—*Radio Retailing*, March, 1935.

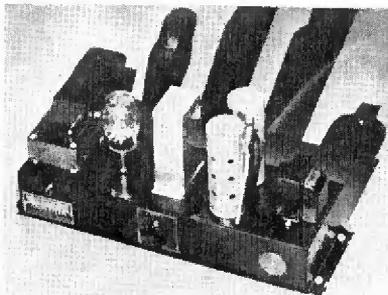


Radolek Pre-Amplifiers

"Bring your amplifier up to date" is the slogan the Radolek Co., 601 W. Randolph St., Chicago, suggests in offering its new a.c. operated crystal-ribbon pre-amplifier.

The unit employs the triode portion of a type 75 tube and a 77 tube connected as a triode in a resistance capacity coupled circuit with an overall gain of 70 db. A well filtered power supply using a type 80 tube, two chokes and 26 mfd. of capacity makes the pre-amplifier independent of associated units. \$33 with tubes.

An amplification of 115 db. and an output of 18 or 36 watts with less than 5% distortion and input circuits for two crystal mikes which can be mixed or faded in any desired proportion, feature the new a.c. operated amplifiers Radolek is also offering. The largest employs 10 tubes and the smaller three. Each mike circuit has its individual tone and volume control. The 36 watt amplifier is \$150 and the 18 watt model is \$125 with tubes.—*Radio Retailing*, March, 1935.

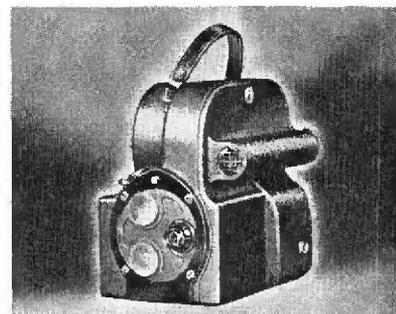


Cathode Ray Oscillograph

Production of a cathode ray oscillograph for use in the radio service-dealer field is announced by the National Union Radio Corp., 400 Madison Ave., New York City.

It is designed to permit operation up to 100 mc., has linear sweep circuit covering the a.f. range, controls for rough and fine frequency adjustment, synchronization and sweep amplitude, two single stage amplifiers with a simple switching arrangement enabling one stage to be used on either axis or two stages on one axis, and sweep circuit and amplifier.

This oscillograph is made available either on an outright purchase basis or with the purchase of National Union radio tubes on one of this company's regular shop equipment contract offers.—*Radio Retailing*, March, 1935.

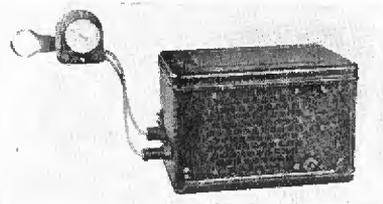


RCA "Talkie" Equipment

Sound-on-film equipment for the amateur who likes to make his own "talkies" has been introduced by the RCA Mfg. Co. Inc., Camden, N. J.

The new sound camera utilizes film 16 mm. wide with sprocket holes on only one side and a narrow track on the other side for recording the sound. In appearance and size it is similar to silent amateur movie cameras and, although it incorporates a complete sound recording system, weighs only 8½ lb. fully loaded. \$350.

For recording outside sound effects as well as the persons being photographed, a separate mike attachment, together with electrical amplifying and recording equipment is provided for convenient mounting on a tripod on which the camera is also placed. \$250 extra.—*Radio Retailing*, March, 1935.



Crosley Auto-Radios

Newly patented features distinguish the 1935 "Roamio" auto-radios of the Crosley Radio Corp., Cincinnati, Ohio. One is the syncrotube, developed and used exclusively by Crosley. It eliminates the use of a separate rectifier tube or motor generator, obviating the need for B-batteries. Increased tube efficiency also characterizes these sets. In Model 4A1, a four tube set, there are two double purpose tubes which, combined with the syncrotube, give performance equal to a seven tube set, it is stated. Similarly, the Roamio 5A3, with its two double purpose tubes, has the performance of an eight tube set.

The Synchronode "B" eliminator used in these sets does away with B-batteries and eliminates the rectifier tube. The speaker is a 6 in. full floating, moving-coil electrodynamic.

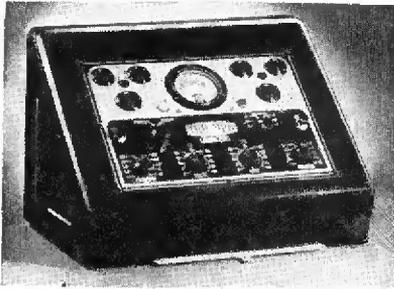
Chassis, speaker and Syncrotube power supply are all housed in one compact case on the outside of which is mounted the airplane dial.—*Radio Retailing*, March, 1935.

Turner "Dia-Cell" Microphones

A new line of "Dia-Cell" microphones is offered by the Turner Company, Cedar Rapids, Iowa, to meet present day requirements of high fidelity reproduction of sound.

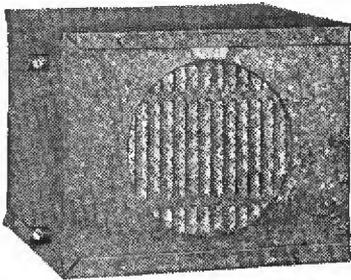
They employ a number of Dia-Cell units connected in a series-parallel arrangement. The effective diaphragm area of each unit is approximately one-fourth the size of a postage stamp. This small diaphragm in conjunction with an improved mounting and driving method, results in a flat frequency response from 30 to 7,000 cycles with a rising characteristic of about five db. from 7,000 to 10,000 cycles. These Dia-Cell models take advantage of desirable inherent characteristics of Rochelle salt crystals.

To meet varying conditions they are available in models using three, four, six or eight Dia-Cell units. For all general purposes, the 4-SC (four cell model) is recommended. Turner also makes several types of microphone stands, one of which has the preamplifier built in the base.—*Radio Retailing*, March, 1935.



Triumph Tube Tester

A dynamic mutual conductance tester, Model 400, is announced by the Triumph Mfg. Co., 4017 W. Lake St., Chicago. Tube faults are detected instantly—low emission, wrong characteristics, leakages, etc. It separately tests diode and triode sections of multi-purpose tubes. Line voltage variations are automatically compensated for by the special method of test Triumph employs. Comes in a two color effect, black and canary yellow, to attract attention, and in two models—counter and portable. \$34.95, net.—*Radio Retailing*, March, 1935.



"Automatic" Auto Radios

The new 1935 line of automobile sets, announced by the Automatic Radio Manufacturing Co., Inc., 112 Canal Street, Boston, Mass., features the Automatic Jr., Twin-Six. This is a 6-tube set with 6-in. dynamic speaker and airplane dial for steering post or instrument panel mounting, listing at \$19.90.

Another model is the Deluxe A-6, a powerful six-tube super, listing at \$49.50.—*Radio Retailing*, March, 1935.



"General" Voltage Regulating Transformers

For localities with great fluctuation of line voltage, the General Transformer Corp., 500 S. Throop St., Chicago, is making a voltage regulating transformer to keep the voltage supply nearest the normal rating. It has a positive manually controlled adjustment and a sensitive voltmeter mounted on the transformer case plainly indicates when the unit delivers rated voltage. This unit is housed in an attractive wrinkle finish black steel case, 4½x7x6½ in. high. Regularly supplied in 3 models.—*Radio Retailing*, March, 1935.

Tungar Battery-Cell Tester and All-Rubber Cord

A special switch which permits the instrument to be used either for the usual high-rate-discharge tests or for open-circuit tests is incorporated in the new Tungar battery-cell tester of the General Electric Co., Bridgeport, Conn.

The body is formed by a molded prod-handle shaped to fit the hand of the operator. A large, easily read meter, located at the top of the handle, has been imbedded in a wide rubber guard to protect it against shocks. Besides having the usual voltage scale, it is marked with special sub-divisions which simplify battery-test readings.

GE has designed a new type of all-rubber parallel lamp cord. Both copper conductors are insulated simultaneously with at least a 1/32 in. wall of high-grade rubber which afford good insulation and permits easy separation of the individual conductor for assembly purposes. Suggested for use with portable radios, lamps, clocks, etc. Comes in brown, ivory, black and olive.—*Radio Retailing*, March, 1935.



DayraD Service Instruments

The new line of DayraD radio service instruments the Radio Products Co., Dayton, Ohio, has just announced, include:

A "Tri-Test" portable checker, Series 20, in both the portable and counter types, listing at \$31.75 and \$33.75, respectively. New type of circuit developed by the DayraD engineering staff has simplified this type of checker greatly.

Series 36 all-wave signal generator (frequencies to cover all bands from 60-60,000 kc. or 5,000 5 meters), has direct reading airplane dial—no charts; no harmonics, multiples or skip bands. \$31.75. Battery operated, same price.

Series 60 output indicator is designed around a new high sensitivity differential type neon glow lamp. High and low impedance outputs may be measured. \$6.

Series 26 grid shift mutual conductance tube tester is \$45; in portable case, \$43.50.

Series 28 signal type dynamic mutual conductance checker is \$59.50.

Series 54 radio set tester (complete analysis without adaptors or changing of test leads) is \$49.50.

Series 56 "Multi-O-Meter" is a milliamper-volt-ohmmeter covering a wide range scale. \$33.50.

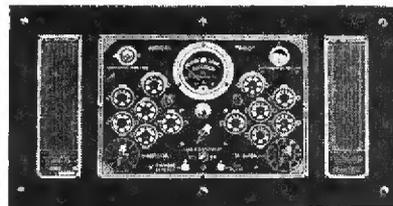
Series 14 tube tester is extremely portable and lists for \$24.75.

DayraD also makes a 4 in. square type, switch-board meter. \$6.—*Radio Retailing*, March, 1935.

B-L Electronic Rectifier

Dry metallic electronic rectifiers for manufacturers and general use are being made by The B-L Electric Manufacturing Co., 19th & Washington Ave., St. Louis, Mo.

These rectifier units are composed of a number of magnesium and copper sulphide composition discs, arranged alternately on a bolt and joined together to form rectifying junctions or couples. These couples are separated by metal plates which serve as terminal lugs and ventilating fins. The characteristics of the disks are such that current will flow only from the copper sulphide composition to the magnesium discs and not vice versa. They come in full wave, half wave and three phase types.—*Radio Retailing*, March, 1935.



"Electronometer" Tube Analyzer

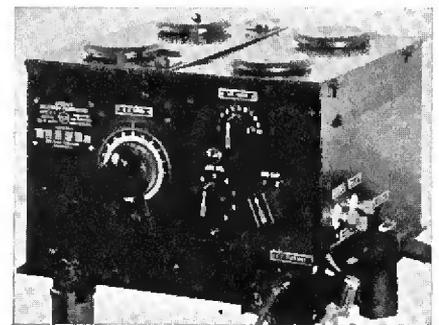
Designed to meet the latest requirements in radio tube testing, the Precision Apparatus Corp., 821 E. New York Ave., Brooklyn, N. Y. has developed the "Electronometer" Model 400. This is an advanced tube analyzer, not merely a tube checker, and tubes must pass three rigid tests before they are "good." Available in three different types: counter, portable and panel. \$39.50 is the dealer's net price.—*Radio Retailing*, March, 1935.

Lafayette Universal Bridge

For the benefit of radio servicemen, amateurs and experimenters, who must have accurate measurements of resistance and capacitance values, Wholesale Radio Service Co., Inc., 100 Sixth Ave., New York City, has brought out the Lafayette Universal Bridge. This is a compact, simplified type of Wheatstone bridge and measures resistors from .01 ohm to one million ohms with an accuracy of 1 per cent and capacitors from .0001 mf. to 100 mf. with an accuracy of 3 per cent, the announcement states.

Because of the design of the special potentiometer, fractional measurements of resistance, which are important in service work, are made with ease.

The instrument measures 9x4½x3 in. Available in kit form for \$10.95; in assembled form for \$12.45.—*Radio Retailing*, March, 1935.



Westinghouse Aircraft Transmitter

A new long distance telegraph transmitter weighing only 15 lb. and delivering a nominal 75 watts of continuous wave radio frequency power to the antenna, is announced by the radio division of the Westinghouse Electric & Mfg. Co., Chicopee Falls, Mass. It operates on frequencies ranging from 333 up to 10,000 kc. by means of plug-in coil assemblies.

The set operates from the 12-volt battery system of the plane through dynamotor.—*Radio Retailing*, March, 1935.

Aerovox Triple-Sealed Condensers

With the return to full-sized sets and more critical electrical requirements, the triple-sealed cartridge condenser of the Aerovox Corp., 70 Washington St., Brooklyn, N. Y. is re-introduced.—*Radio Retailing*, March, 1935.



EDDIE DUCHIN



RAY NOBLE



PAUL WHITEMAN



RUDY VALLEÉ



JAN GARBER



RICHARD HUMBER



ENRIQUE MADRIGUERA

Big Names mean Bigger Profits!

The greatest galaxy of class bands in record history now on Victor Records!

These are the money names in the music world—Rudy Vallee, Paul Whiteman, Ray Noble (that Englishman whose sweet tunes preceded him across the water and built a big public before he ever set foot in the United States), Eddie Duchin, Richard Humber, Enrique Madriguera, Jan Garber!

Where they play, box offices break records. Their music has charmed more American dollars into circulation than any other group of popular bands!

You can't help but make money when you tie up with these names! They're the ones who are pushing the sales of Victor Records to new highs each month!

For these favorites can be heard, exactly as they play, on the new, higher fidelity Victor records. Never before has any kind of reproduction achieved such crispness and definition, such a thrillingly life-like quality!

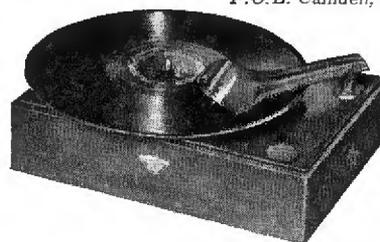
Get These New Victor Releases

- 24850—DREAMING A DREAM—F.T. Ray Noble and His Orch.
- SITTING BESIDE O'YOU—F.T. Jack Jackson and His Orch.
- 24849—BLUE MOON Al Bowlly, with accompaniment arranged and directed by Ray Noble
- IN A BLUE AND PENSIVE MOOD
- 24852—SERENADE FOR A WEALTHY WIDOW Paul Whiteman and DEEP FOREST (A Hymn to Darkness) His Concert Orch.
- 24851—YOUR FEET'S TOO BIG—F.T. The Ink Spots
- SWINGING ON THE STRINGS—F.T. The Ink Spots

RCA Victor Record Player Making Huge New Market for Records!

\$16.50

F.O.B. Camden, N. J.



Transforms any modern AC radio into a fine electric phonograph!

One of the big factors behind the sharply rising curve in record sales! It puts turn tables into thousands of homes that could not afford the expense of a combination radio-phonograph!

Attached to the radio, it produces the finest tone ever heard from that machine. It can be operated from the arm chair—doing away with the annoyance of rising to change records.

It's a "natural"—it has everything! And the more RCA Victor Record Players you sell, the more Victor records you sell, too!

This is the time to make money on records!

IT PAYS TO SELL

Victor Records

THEY'RE HIGHER FIDELITY



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

MAIL THE COUPON!

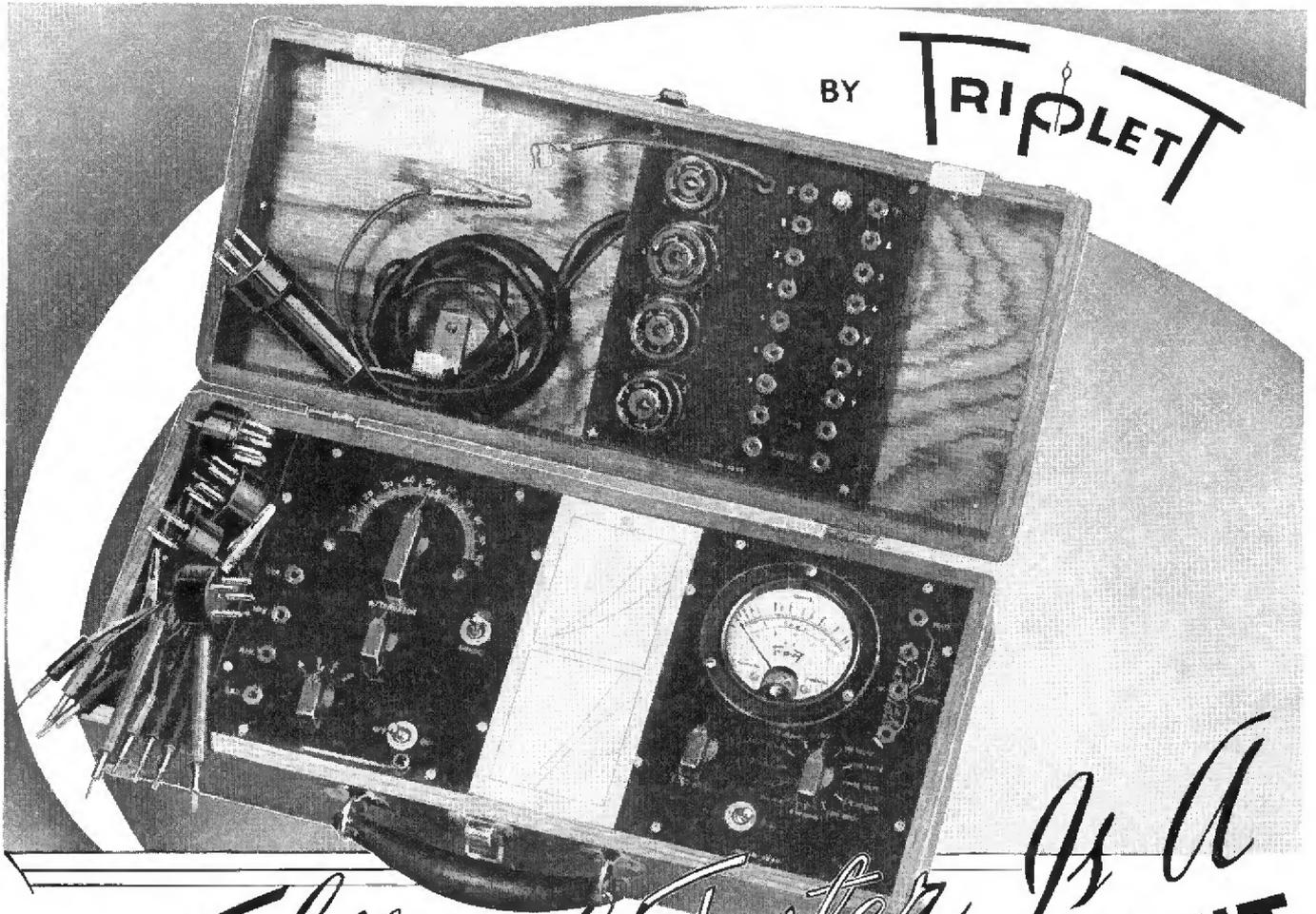
RCA Manufacturing Co., Inc.
RCA Victor Division, Dept. R.R.
Camden, N. J.

Please send me complete information about the newest Victor Records, the new Record Player—and also about the BlueBirds, fastest selling low-priced records.

Name.....

Address.....

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



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This Universal Tester Is A
COMPLETE SERVICING OUTFIT
 No. 1181

No. 1181 Dealers net
 price \$38.00

Your Jobber Can Supply You

MAIL TODAY FOR DETAILS!

The Triplet Electrical Instrument Co.
 140 Main St., Bluffton, O.

Gentlemen:
 Send me catalog on Triplet Universal Test Set, and complete line of radio servicing instruments.

Name

Street Address

City

State

EVERY needed test that a service man has to make can be handled by this compact Test Set. Consists of three essential units:

Volt—Ohm—Milliammeter with precision universal meter, reading both A.C. and D.C. volts at 1000 Ohms per volt, up to 750 volts; Milliamperes up to 150, both A.C. and D.C. and resistances up to 3 megohms. Complete with batteries.

Free-Point unit is fastened in the tester cover. When used in conjunction with the Volt—Ohm—Milliammeter, all voltage—current—resistance tests can be made direct from the radio set sockets.

All-Wave Signal Generator covers frequency ranges from 110 to 18,000 KC. Frequency stabilized. Attenuation perfected for all sets. Hand calibrated charts. Tube furnished. This improved unit is an outstanding part of the 1181.

The handsome quartered oak case in which it comes will appeal to every professional service man.

THE TRIPLET ELECTRICAL INSTRUMENT CO.
 140 Main St. Bluffton, O.

SERVICE SECTION

Conducted by
W. MacDonald

Including
Installation Data

CIRCUITS of the MONTH

6E6

National Union has just announced a new tube of the 6 volt series designated 6E6. It is a heater-cathode type combining two low-mu output triodes in the one bulb and is intended for use in output stages of a.c. or d.c. operated sets. Connections for the two triodes are brought out separately with the exception of heaters and cathodes, connections for these being common to both sections. Thus the two triodes may be operated in parallel or in push-pull.

Characteristics are as follows:

Heater voltage (a.c. or d.c.)	6.3
Heater current	0.6
Base	Medium 7-pin
Maximum height	4 1/8 in.
Maximum diameter	1 1/8 in.
Plate voltage	180 250
Grid voltage	-20 -27.5
Plate current (per plate)	11.5 18
Mutual (per triode)	1400 1700
Amplification factor	6 6
Plate resistance (per plate)	4300 3500
Load (plate to plate)	15000 14000
Output (both triodes)	0.75 1.6

Socket connections, looking at the bottom of the socket and reading around clockwise from the two large heater pins are: Heater, heater, plate triode 2, grid triode 2, cathode, grid triode 1, plate triode 1.

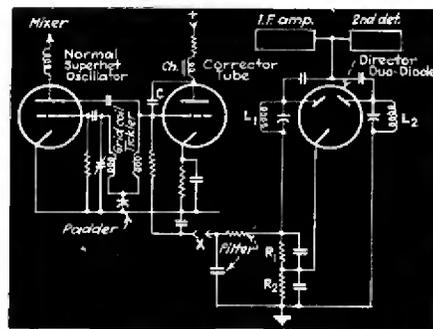
"Signal-Seeking" Circuit

In one of our advance-dope dispensing "AUDIO FREQUENCY" columns last year we tipped off readers that engineers were trying to work out a system which would automatically insure good quality from sharply tuned supers even though the user failed to dial plumb center on the carrier. Experimental work has not yet progressed to the point where we can present a cut-and-dried circuit complete with constant values but we pass along a fundamental scheme developed by S. Y. White of "Loftin-White" fame.

White's proposed system uses a duodiode as a "director." L_2 is tuned to a frequency slightly higher than the

sharply tuned i.f. while L_3 is tuned slightly lower than the i.f. Thus, if the receiver is detuned slightly off the center of the carrier on the high side rectified signal current flows in one diode circuit while if it is detuned on the low current flows in the other.

R_1 constitutes the load for L_1 while R_2 serves a similar purpose for L_2 . It



is readily seen that d.c. control voltage developed by diode signal rectification is available at point "X", a conventional resistor-capacitor filter confining signal frequencies to the director circuit. *The important point to note is that the available control voltage will be positive or negative, depending upon which diode is doing the work.* For the director tube's cathode is connected to the midpoint between the two load resistors and rectified current flows from diode plates to cathode through R_1 and R_2 in opposite directions.

Now, having a positive voltage available for control purposes when the receiver is tuned off on one side of the carrier center and a negative when it is dialed slightly off on the other how are we going to use this voltage to automatically force slightly detuned signals to provide the desired i.f.? We can't change the signal frequency so, obviously, the thing to do is change the oscillator frequency so that the correct "difference" is forced.

The control voltage could be used to actuate a motor, which would in turn swing the oscillator tuning condenser to the correct point. A Rochelle Salts crystal, which would change its physical position with applied voltage could be

used as one plate of a trimmer condenser hooked in shunt with the tuned circuit. But some electronic means of control is more desirable. White uses a "corrector" tube to electronically trim the tuning capacitor of a superhet's normal oscillator in the desired direction.

The diagrammed tube labelled "normal superhet oscillator" differs little from those found in existing receivers, has the usual grid coil and tickler. Obviously, if some small capacity capable of being automatically varied by the control voltage already developed could be connected in shunt with the main oscillator tuning capacitor the oscillator frequency could be automatically varied to develop the proper beat even if the set were slightly detuned. White does this very thing, connecting a small, automatically variable capacity across the tickler portion of the oscillator circuit, which, to a certain extent controls the developed frequency. Connection in shunt with the grid coil is avoided as experience has shown that such connection does not readily give uniform control performance over the whole tuning range of the receiver.

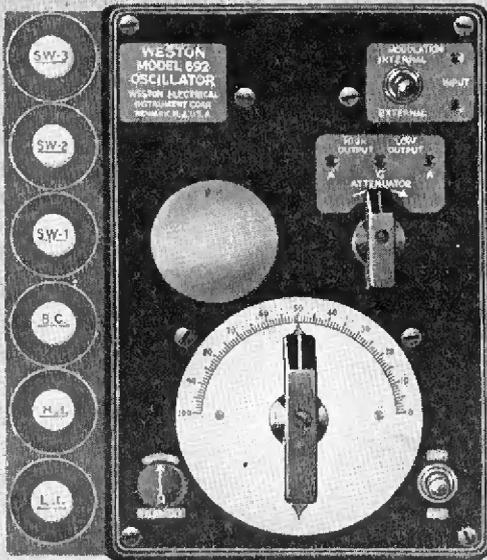
The automatically varied trimmer capacity is not a conventional condenser, so don't look for one. It is the input capacity of the "corrector" tube. It seems that the "reflected" input capacity of a tube is considerable if it has a capacitively reactant plate circuit. The iron-cored choke Ch. and capacitor C are included to heighten this effect. And what is of greatest importance, *input capacity can be increased or decreased by changing the tube's bias.*

Here, then, is the complete picture. The director tube, working off an intermediate signal, provides a positive or negative control voltage, depending upon which side of the carrier center the receiver's dial is detuned. This control voltage changes the bias on the corrector tube, hence the input capacitance of this tube changes. And as the input capacitance of the corrector exerts a tuning effect on the oscillator detuning of the receiver 2 or 3 kc. off the carrier center does not result in bad audio cut-off by the i.f. stages. The oscillator simply changes its frequency slightly so that

PROFITABLE SERVICING DEMANDS

AN *Accurate* ALL-WAVE OSCILLATOR

Here it is



The image shows the Weston Model 692 Oscillator, a rectangular metal device with a central dial and various control knobs and switches. The dial has a scale from 0 to 100. On the left side, there are six circular buttons labeled SW-3, SW-2, SW-1, B.C., H.L., and L.C. The top of the device has a label that reads 'WESTON MODEL 692 OSCILLATOR' and 'WESTON ELECTRICAL INSTRUMENT CORP. NEWARK, N.J. U.S.A.'. There are also labels for 'OSCILLATOR INTERNAL INPUT', 'HIGH OUTPUT', 'LOW OUTPUT', and 'ATTENUATOR'.

ALL WAVE!
Complete Receiver Frequency Coverage

BASIC!
Frequency Band Depends Only on Plug-In Coil

STRAY FIELD!
Below 1/2 Microvolt at all Frequencies

OUTPUT!
1 to 100,000 Microvolts

Triple Shielded Attenuator

Independent Modulation Circuit Constant Percentage

High Impedance Input for External Modulation

Constant Impedance 200 Ohm Output Circuit!

Individually Designed Coils for Each Band

Here's the complete solution to your oscillator problem! Weston supplies it in the new Model 692 . . . an oscillator designed to do a precision aligning job on radio receivers.

A few of the outstanding features of this all-wave precision oscillator are shown above. Study them carefully . . . and make your own compar-

isons. Then, send for the descriptive bulletin which contains all the facts on Model 692 . . . the oscillator you have been waiting for . . . one that will enable you to give complete customer satisfaction on every aligning job. Be sure to mail the coupon today. . . Weston Electrical Instrument Corp., 581 Frelinghuysen Avenue, Newark, N. J.

WESTON
Radio Instruments



Weston Electrical Instrument Corporation, 581 Frelinghuysen Avenue, Newark, New Jersey.

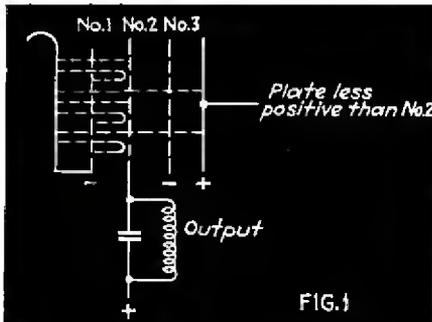
Send for Bulletin on Model 692 All-Wave Oscillator.

Name _____
 Address _____
 City _____ State _____

SERVICE SECTION

the correct i.f. is automatically produced.

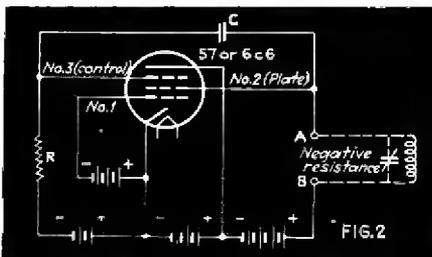
It may be desirable, points out Mr. White, to include a control voltage amplifier at point "X".



Oscillator Uses No Tickler Or Coil-Tap

A 57 or 6C6 may be used as an oscillator with an extremely simple coil system without tickler or taps, according to RCA, by employing the tube as a negative resistance device. The idea, we are told, is particularly useful in the design of multi-band receivers and certain testing instruments as switching is considerably simplified. It is not recommended for use at frequencies higher than 15 mc., however.

In an ordinary oscillator it is necessary not only to feed back energy from the plate circuit to the grid circuit in order to maintain oscillation but also to reverse its phase. The necessity for phase reversal occurs because a positive signal voltage applied to the



control or input element produces an increase in a.c. plate current, hence a decrease in a.c. plate voltage due to resistive drop in the load. Thus voltage changes in input and output are out of phase.

If plate voltage could be made to increase when control grid voltage increased feedback could be accomplished simply by passing energy back to the grid through a condenser, phasing being automatically taken care of. And this is exactly what is done in the negative resistance circuit.

If the element potential differences illustrated in the first diagram are provided electrons emitted by the cathode will for the most part be attracted by grid No. 2, which in this instance serves actually as the circuit's plate. Some will

pass straight through No. 2 to the usual plate. These are not usefully employed. And some will "bounce" off No. 2 and try to return to the cathode, to be prevented from actually getting there by collector No. 1. (The No. 1 grid, incidentally, provides a simple means of controlling the strength of oscillation as variation of bias on this element can limit d.c. plate current.)

Now, let's assume that a certain steady d.c. plate current flows in the associated circuit of the No. 2 output element. A positive signal voltage is applied to control grid No. 3. The combined attraction of the actual plate and No. 3 draw more electrons right through No. 2, hence the current flowing in the circuit of No. 2 decreases and a.c. plate voltage rises. This is the effect we have been striving for. All that it is necessary to do to produce circuit oscillation is to feed back some of the energy from the plate circuit (No. 2) to the control grid (No. 3) and this is done by condenser C. A shunt-tuned circuit would, of course, be included across points A and B.

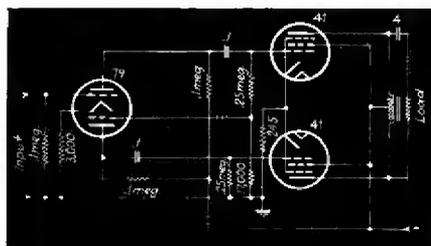
Condenser C and gridleak R must be chosen as carefully as, say, the coupling condenser and leak of a resistance-coupled amplifier. In general, the condenser reactance must be small compared to the leak resistance. Increase in the value of either component betters negative resistance performance at lower frequencies.

79 Driver-Phase Inverter For Push-Pull 41's

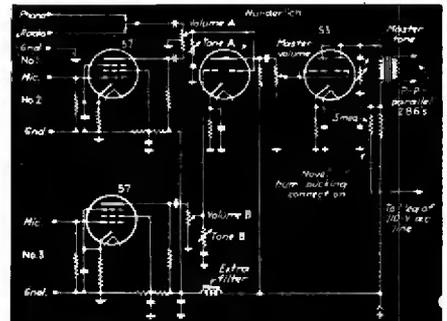
It seems probable, we are told by Hygrade-Sylvania engineers, that the 41 will be seen this season in push-pull output circuits of more expensive autoradios.

Here is a suggested arrangement suitable where space is at a premium. A 79 "twin" is used as a combination driver and phase-inverter, one triode section performing the first function and the other the second, operating a pair of pentodes without the use of a push-pull transformer. The circuit shown is in "skeleton" form. Set makers will no doubt modify the constants slightly but forewarned is forearmed . . . when you see this combination you'll be familiar with it.

A pair of 75's may be used in place of the 79, giving the audio system slightly greater sensitivity and providing four diode plates for use in other circuits but this, of course, involves the



use of four tubes in place of the three diagrammed.



Flexible Mixer System Unique Hum-Bucking Circuit

Radolek's new 36-watt amplifier is equipped with an extremely flexible input mixer system. Circuit No. 1 will handle the output of a pickup or radio, has a switch for transferring from one to the other. Signals from this circuit are applied directly to one grid of a Wunderlich tube equipped with two co-axial grids.

Circuit No. 2 provides a stage of high-gain amplification before the Wunderlich, permitting the use of a relatively insensitive mike. The output of circuit No. 1 may be "faded" into that of No. 2 by manipulating control "A."

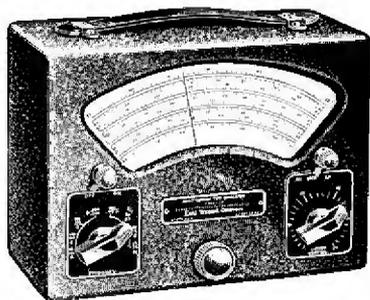
Circuit No. 3 provides still a third input connection, the output of its 57 high-gain pre-amplifier working into the second Wunderlich control grid. Relative volume of circuits No. 1 and No. 2 and circuit No. 3 may be controlled by proper adjustment of volume controls "A" and "B." Note also that individual tone controls "A" and "B" are provided for these two circuits. Matching transformers may, of course, be placed between signal generating device and any of the input terminals, adapting the amplifier to either low or high impedance pickup devices.

In the input circuit of the 53 used as a triode driver a master volume control is included. Thus individual inputs may be controlled and overall amplifier gain adjusted with the master volume control. A master tone control is likewise built into the output circuit of the driver stage, further enhancing flexibility.

Then, also, there is a novel hum-bucking arrangement, consisting of a .5 megohm resistor connected between the low end of the driver stage output transformer primary and one side of the a.c. 110 volt line. The function of this unique arrangement is explained by Radolek engineers as follows:

"The hum-bucking circuit is designed to cancel 60 cycle a.c. induced in the push-pull input transformer by the magnetic field of the power transformer. As this is 60 cycle induction the small amount of a.c. taken from one side of the line cancels it out. Proper connection must be determined experimentally for very amplifier but reversing of the plug in the outlet makes no appreciable difference once this is done."

FIRST FULL VISION DIRECT READING ALL WAVE TEST OSCILLATOR



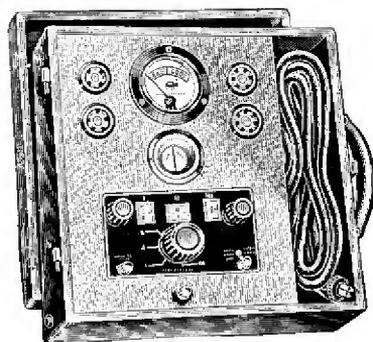
\$29.95

New Model 20

47-inch fan shape laboratory type scale. No confusing graphs or charts. Continuously variable range. 8 bands cover from 90 kilocycles to 25 megacycles. *All on fundamental frequencies.* Dial-Standardized at 48 points with Crystal Controlled Frequency Standards. Knife edge pointer with vernier drive. Licensed American Telephone & Telegraph circuit. High, Medium and Low switch affords perfect attenuation control throughout entire range. 400 cycle note, approximately 35% modulated, obtained by separate modulator tube. A. F. Signal controlled by panel switch. One piece aluminum case prevents strays. Light weight, compact—*carry it anywhere*; battery operated—*use it anywhere*; A.C. or D.C. districts, auto radios, farm radios, etc. It has the approval of *many* set manufacturers.

FIRST TUBE TESTER WITH ILLUMINATED CONTROL PANEL

New Model 30



\$34.95

New "NEON GLO" Tube Tester

Dramatic and Sensitive Hot Short and Leakage Test. Large "Bad-Good" Meter Dial for Quality Test. Striking Control Panel with 3 Dial Windows attractively illuminated. Efficient "Neon Glo" Condenser Tester indicates leaky, open, or shorted condensers. Extremely Accurate—Yet Quick, Simple, and Easy to use—a Real Tube Seller Testing Over 140 Types. Distinctive, Instrument-like Panel with New Appealing Art Metal Finish, is housed in large Quarter Sawed Oak Carrying Case. Quality Construction Thruout. Moving Coil Meter, Tapped Primary Input, Large 2 Watt "Neon Glo" Lamp. Over-size Transformer. Only 4 Sockets, important switch contacts are silver plated, electronic rectifier, Oak Carrying Case—size 13 by 12 by 5½. Net weight—12 lbs.

FIRST SALES AND SERVICE RADIO TUBE MANUAL

Takes the mystery out of tube selling

It brings order out of chaos—No More Frantic Hunting for tube data. Here's all essential Sales & Service Information in One Book. Any clerk, regardless of radio experience, can USE IT—Sell TUBES WITH IT—Recommend Interchangeable Types with Confidence. It Speeds up Tube Sales—Saves Time and results in Prompt, Efficient Service to your customers.

Don't Pass up Sales of Obsolete or Rarely used types—Make this Additional Profit by using the WEBBER D & S MANUAL. Only one such sale will pay for it.

It's complete—most ballast types and every Receiving Type ever used in receiving sets—250 of them with all essential information—Tube base diagrams and Characteristic sheets for each listed type. It goes into the matter of Substitution very thoroughly not only of tubes of one type but also substitution of late types for older types.

The Tube Index with its interchangeable data and complete listing is alone WORTH THE PRICE. Order your copy today—200 loose leaf pages—8½x11, chock full of Sales & Service Information.



**Saves you Time
Makes you Money**

\$1.50

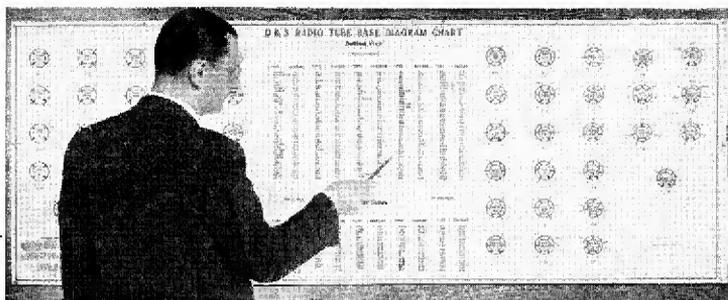
You will find that this manual has *all* the tube information you'll ever need. If we're wrong, return it within 10 days and your money will be refunded.

FIRST WALL CHART OF TUBE BASE DIAGRAMS

**Keeps Your Bench Clear
—Your Hands Free**

Tack this Handy Chart over your Service Bench or in your Shop. It's a Time Saver. Lists over 300 types of American and Canadian Receiving and Ballast Tubes with over 50 Diagrams. A Quick Glance and you have the desired information. No Need to stop and "look it up" somewhere. It's Accurate—Complete—and Readable at a distance of Six Feet. Size 18 by 48 inches on heavy durable stock. *Send for one or more today.*

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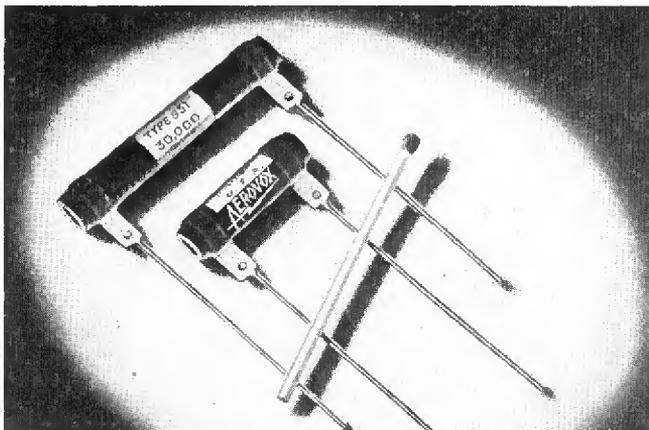
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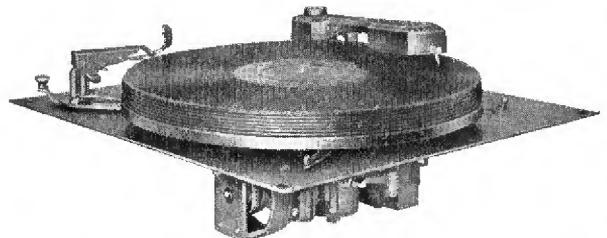
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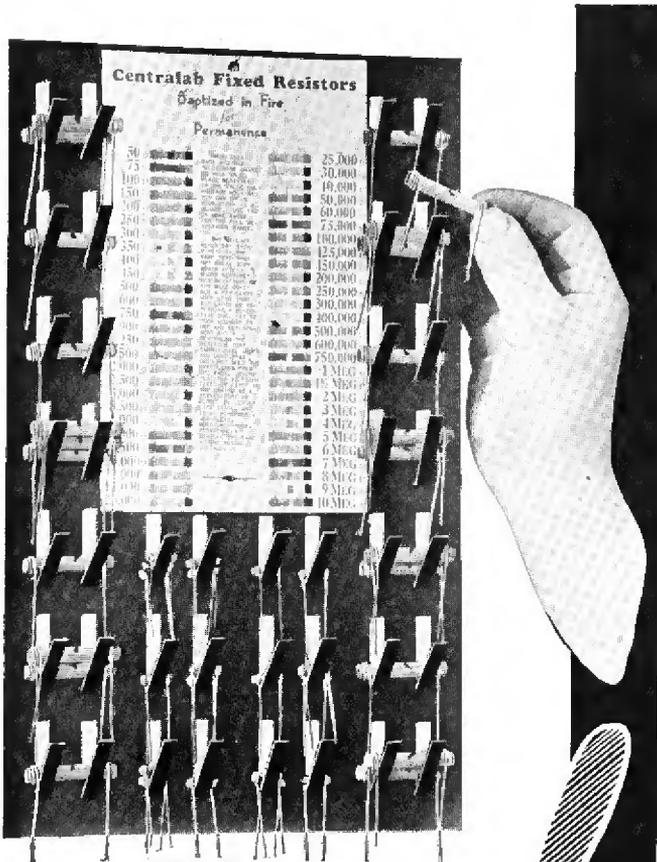
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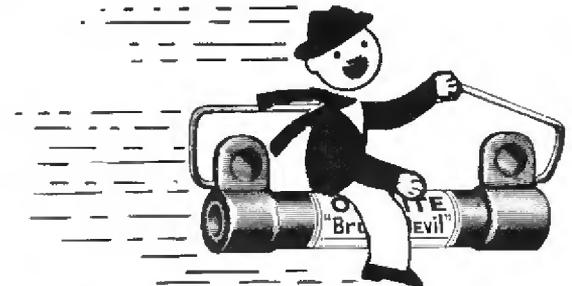
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MORE USES FOR THE CATHODE-RAY OSCILLOGRAPH

How to check overall receiver performance, locate causes of intermittent operation, overload and distortion

By JOHN ALLEN

RCA Mfg. Co., Inc.

MUCH has been written about the cathode-ray oscillograph as an instrument for aligning r.f. and i.f. amplifiers. This is, of course, an extremely important function but the instrument has many other equally important applications. It is so flexible, in fact, that a complete cataloging of its uses cannot be attempted in this article. The author, rather, merely outlines just a few of the most obvious.

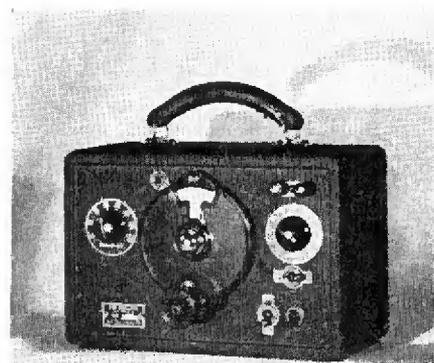
In simple language, the cathode-ray oscillograph is a peak voltmeter which also records time with no appreciable amount of inertia. It can thus be used as a very high resistance voltmeter for measuring all kinds of alternating current voltages. Because it records time the intensity of any alternating current phenomena may be spread out on the screen of the tube so that time can be seen. And because it has little inertia the indication can be repeated a sufficient number of times per second to draw a pattern on the screen.

Immediately valuable applications are:

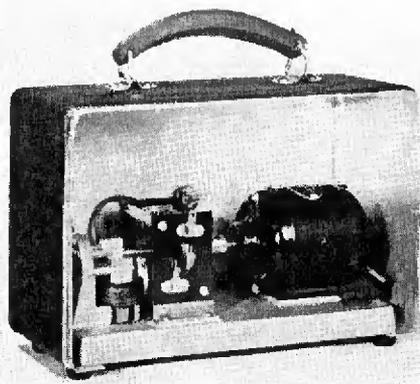
- (1) Checking intermittent conditions of reception.
- (2) Checking overload and distortion.
- (3) Demonstrating overall receiver performance, and, of course:
- (4) Visual alignment of r.f. and i.f. stages.

Intermittent Operation

To check intermittent conditions in a receiver the easiest method is to tune in a modulated r.f. signal in the usual manner and then examine its form in passage through each successive stage. A convenient method when using, for example, the RCA oscillograph, is to connect the vertical plates between plate and ground of each successive stage. The horizontal



Standard all-wave test oscillator employed in conjunction with basic unit and frequency-modulator when aligning, checking intermittent reception, comparing overall receiver performance



Motor-rotated condenser type "frequency-modulator" accessory needed only for alignment work

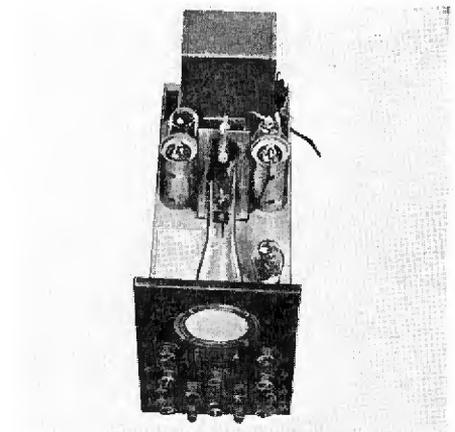
saw-tooth oscillator of the instrument must be set at its maximum value in the case of radio frequency signals and at a lower value (less than the audio frequency examined) in the case of audio frequency signals.

Watch the signal pattern on the cathode-ray tube screen long enough to determine whether or not the first stage tested is functioning ok. Then go on to the next, and the next. The faulty stage will show up visually.

Overload and Distortion

Often the serviceman is confronted with the problem of rectifying distorted reproduction. This may be due to any one of many causes, usually difficult to run down. To use the cathode-ray oscillograph in locating such trouble it is used in conjunction with a modulated r.f. oscillator.

Connect the input of the receiver to the output of the test oscillator and tune the



Basic oscillograph unit equipped with built-in vertical and horizontal plate amplifiers plus necessary half- and full-wave rectified power supplies

oscillator to a frequency at which distortion is experienced. The oscillograph should be connected to the output of successive audio stages as outlined above if the audio system is suspected, and it usually is at the root of the trouble. Use a horizontal sweep frequency that will show several cycles of modulation.

By successively connecting the vertical plates to the output of the detector, first audio and output stage one can quickly determine not only the stage in which distortion occurs but also at what volume level it occurs and in what stage overloading takes place first. For example, if the wave form is entirely symmetrical at one stage and distortion occurs in a later stage it is obvious that the distorting stage is the offender and the trouble can be corrected where it occurs without reducing the efficiency of innocent a.f. stages.

This use of the instrument is particularly desirable to builders of amplifiers as the equipment can be engineered in such a manner that the full output of a given stage can be realized before adding another.

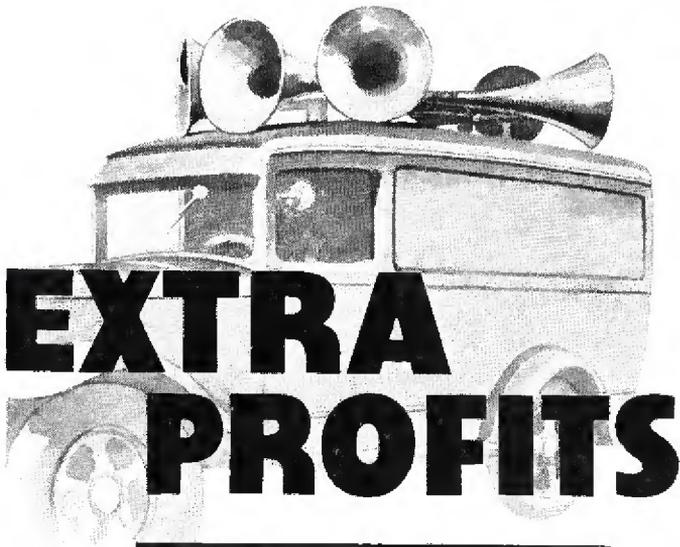
Overall Performance Comparison

There are several methods of determining the overall performance and fidelity of a receiver. Perhaps one of the simplest is to take the output of the power stage directly into the vertical plates of the oscillograph, using an arbitrary value of sweep frequency (within the audio range of the receiver). From this it will be seen that receivers having a limited output will give a limited voltage change for variations in intensity while receivers with high output will give a greater change at once noticeable on the screen.

Other demonstrations can be made to show the modulating envelope of any broadcasting station as well as the various volume levels at which distortion occurs.

Alignment

It is well at this point to review use of the instrument for alignment. To visually align the r.f. and i.f. stages of a receiver using the instrument pictured it is neces-



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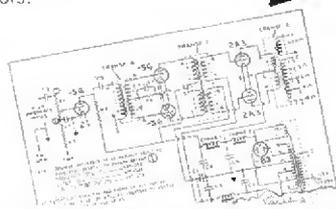
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SERVICE SECTION

sary to have a test oscillator, also shown, and a "frequency-modulating" accessory, included in the photos.

In principle the radio or intermediate frequency is fed through the stages to be aligned and varied at an audio rate by means of the frequency modulator. (The frequency modulator, in our case, consists of a rotating condenser of small capacity, driven by a motor, and an a.c. impulse generator.) Simultaneously with such fre-

quency variation it is necessary that an a.c. voltage be generated to properly synchronize the horizontal deflection in the oscillograph with this r.f. or i.f. frequency variation.

Under such conditions the overall curve of the tuned circuit between the point at which the oscillograph is connected and the point to which the variation frequency is applied will be shown on the screen. The effects of any trimmer adjustment are im-

mediately seen. This is especially useful when aligning receivers having a flat-topped intermediate stage in which the width of the i.f. channel passed influences to a considerable extent the amount of high-frequency response delivered to the speaker.

Association with cathode-ray equipment quickly discloses other important applications, of which those outlined herein are only a guiding sample.

SHOP SHORTCUTS

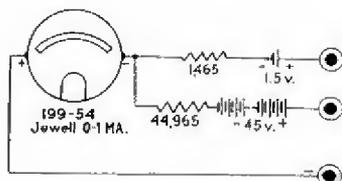
Jewell 54 or 199 as Ohmmeter

By E. F. Staunton

One-mil Jewell Pattern 54 or 199 meters were so popular several years ago that most servicemen have one or the other on hand. Either meter may be converted into an accurate ohmmeter with two practical ranges, one reading from 25 to 50,000 ohms and the other from 2,000 to 2,000,000, direct.

The circuit is reproduced herewith, showing the resistors and batteries required. So also is a full-size scale, which may be pasted over the original face with rubber cement.

Borrow somebody's calibrated ohmmeter and go through the stock of a friendly jobber. If you test enough high quality resistors rated at 1500 and 50,000 ohms you will be sure to find a pair that test very close to 1465 and 44,965. Or two adjustable wire-wound units may be used, permitting compensation for battery deterioration.



Neon Sign Interference

By D. G. Fink

Noise from neon signs may have any one of several causes. If the sign is of the flashing or on-off variety sparking at the contacts of the switch which accomplishes this flashing action may produce intermittent noise. A steady buzz is usually caused by what is known as "flicker voltage." If the transformer

which operates the sign is overloaded a radio frequency voltage will be generated by the windings. Loose connections between transformer and the neon tubes themselves, or between separate sections of tubing, are also commonly found.

A by-pass condenser usually cures arcing switch interference. Overloaded transformers may be replaced with new and larger units. The transformer casing, and the metal sheath of any connecting wires should be thoroughly grounded. It may be well to point out to users of such signs the fact that they are operating inefficiently and expensively if they cause radio noise.

Eliminating Code Interference in Auto Sets

By M. Chernov

Many auto radios using autodyne oscillator-detectors, with no pre-selector stages, have 456 kc. intermediates. This frequency is close enough to naval and coast code stations, particularly on the coasts, to permit interference pickup.

An i.f. transformer taken from a model having a 456 kc. intermediate can be used as a wavetrap in the antenna circuit.

Sets in Boats

By Ralph L. LeBrun

When installing radios in boats be careful to warn the owners to remove these sets when laying the boats up for winter. Failure to do this usually results in bad by-pass condensers, ruined field coils or rusted voice-coils.

Police Calls on Old Sets

By B. O. Bass

Most of the older t.r.f. receivers may be re-vamped so that upper police calls can be received. Their dials are rarely calibrated in kilocycles and even if they are seldom have finely marked divisions, so that a slight shift in the scale does not bother the customer.

The easiest method of extending the range toward the higher frequencies is to lower the minimum capacity of the tuning condensers. In many sets using small tuning condensers it is merely necessary to loosen phasing capacitors as much as possible on weak signals at the lowest number on the dial, then turning up the dial to regain the signal and re-phasing with the smallest possible pressure on the phasing condenser plates. Re-alignment is rarely necessary but may be done to be safe.

Sets whose topmost station is dialed at 75 to 95 can have their high frequency range extended by twisting off an equal number of rotor and stator plates from each tuning condenser. This must be done carefully, of course. Roll the blades up and off on a pair of long-nosed pliers, much as if you were using an old-style can-opener. Re-align and balance the receiver. Battery receivers of the older variety respond nicely to this treatment. The old Crosley black "bathtub" type condenser will stand as many as three rotor and stator blades removed. One model even took in the 120 meter band without losing low frequency stations.

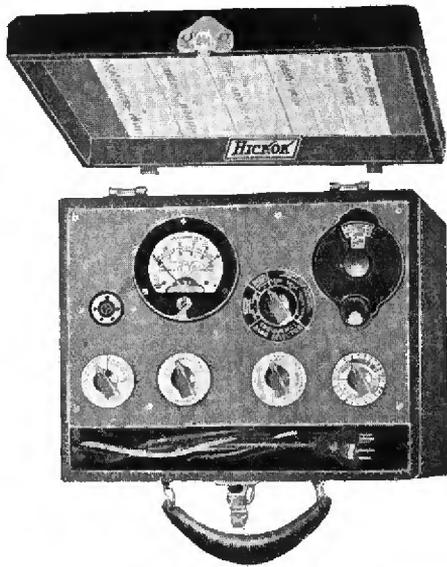
Sets having dials graduated in kc. should have their dials re-set on the shaft so that the markings are about correct from the middle of the dial up to 550 kc.

I have extended about a hundred receivers to date and have so far failed to find a t.r.f. job which does not respond satisfactorily to this treatment.



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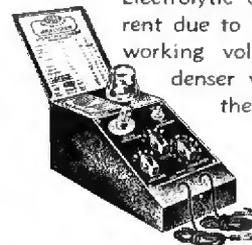
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ARVIN 20A, 30A. No reception although set sounds alive . . . Inspect r.f. chassis unit and if tube heaters are not lit repair broken "A" choke in audio unit. Tubes in r.f. chassis light but vibrator is not heard . . . Check same choke for break at opposite end. Set overloads on powerful local signal . . . Replace 75 with 85, which will cut sensitivity somewhat but give better tone.

AUDIOLA, Jr. Oscillation after some time in service, not curable by re-balancing . . . Insert .0001 fixed condenser between detector plate and ground and then re-balance. To increase volume . . . Disconnect 50,000 ohm resistor section in series with screen-grid lead and replace with 35,000 ohms, raising screen potential.

CLARION, JR. 320. Speaker rattle . . . Insert a few drops of light oil between pole piece and voice coil. Use it sparingly and there is little danger to coil.

CROSLY 170. Improving tone and volume . . . Connect a 2 to 4 mike bypass across the a.f. stage bias resistor. Improving sensitivity . . . Reduce value of diode load resistor from .5 meg. to .35 or .4 meg. This will also reduce background noise.

GM 120, 130. Hum, reception normal . . . Replace .1 mike condenser located under a.c. terminal strip.

KENNEDY 4-TUBE AC-DC. Balancing . . . Set should be balanced in its metal case. Drill small hole in metal case just over the balancing screw in the condenser gang. It will be scarcely noticeable and helps you do a real job.

MAJESTIC 90, 90B, 100B. Rejuvenating the appearance of the dial . . .

Remove all paint with alcohol and wipe the dial dry. Then repaint with black Duco. Let the paint dry and then rub it with fine steel-wool dipped in crude oil. The raised numbers will shine like a new assembly. Where numbers are stamped in with a sharp indentation the paint may be cut out with a knife if a black body and light scale is wanted. Or the dial may be rubbed down, giving a brass body and black numbers. This process can be used on other makes of receiver, for example, the Stromberg 335, 338, 41 and 42 has a stamped dial.

MOTOROLA 55. Vibrator hash and mechanical rattle . . . Remove power-pack can enclosing vibrator and power transformer, turn over and mount securely on chassis with self-threading screws. Replace vibrator and cover and reverse "A" leads to correspond with car battery polarity. Discard tin cover but place rubber bands around pack before putting chassis back in case.

PHILCO 50, 50A. Set becomes noisy and goes into oscillation at low frequency end of band . . . Ground the speaker.

PLYMOUTH, CHEVROLET. New radio installed has little pickup on top antenna installed by car manufacturer, although antenna is not grounded . . . Trouble lies in the fact that these cars use chicken wire and examination discloses that it is too close to body of car. Clip it free all around and then clip out a strip about 1½ inches wide all around. Drive staples into wood supports and lace strong cord through staples and wire to replace the cut away wire.

SILVERTONE 1732. To increase "pep" . . . Install a 10,000 ohm resistor in the screen-grid lead instead of the 15,000 ohm unit normally used in this position. Screen voltage should increase from 60 to 80 volts.

SONORA. Mushy tone, poor audio quality in this and other sets using Peerless dynamic speakers . . . Burnish contacts of voice coil bands to heavy copper strip (secondary) of output transformer. Re-assemble and tighten well.

SPARTON 333. Hum . . . May be a floating ground at the eyelet of the 42 tube. One side of the heater circuit is grounded at this point and if the eyelet loosens an intermittent or fading hum of the same pitch as the vibrator will result. Correct by soldering two additional ground connections of the same type and in the same circuit, one at the 6F7 socket and one at the 78 socket. A grounding wire should also be run from the ground circuit heater terminal of the 75 socket over to the resistor mounting plate, which should be grounded.

How to Use the DECIBEL CHART

The chart on the following page will be useful to public address men and others working with audio amplifiers. It permits voltage gain, or loss, and power gain, or loss, to be translated into terms of db.

Following are typical examples of its use:

To find the actual voltage gain of a tube in a practical circuit look up its μ , plate resistance and recommended load resistance, at normal operating voltage. Substitute these quantities in the expression:

Voltage Amplification =

$$\frac{\mu \text{ of tube } \times \text{ load resistance}}{\text{load resistance} + \text{plate resistance}}$$

Locate the resulting figure on the vertical scale at the left of the chart. Run across to the "gain-ratio" line and drop down to the μ -db scale. This will indicate the voltage amplification of the tube in db.

To find the voltage gain of a transformer, expressed in db, determine its turns ratio (which in the case of a 3 to 1 transformer would be simply 3). Locate this figure on the same scale, run across to the gain-ratio line and again drop down to the μ -db scale for the answer.

When working with resistance-coupled amplifiers the voltage gain may be considered solely that of the tube, figured as outlined above. Well designed impedance coupling units will present the recommended load and may likewise be figured as above. Gain may be considered that of the tube only.

To find the voltage gain of a tube and transformer combination add the db gain of both. This procedure can, of course, be continued for multi-stage amplifiers, working out the db gain of one stage at a time.

If the value of voltage ratio is less than one, indicating a loss (which would be the case in connection with a transformer having a step-down ratio or a tube using an extremely low plate load resistor) use the dotted curve labelled "loss ratio," in conjunction with the figures appearing on the dotted vertical line. The μ -db scale will show the equivalent as before but in this case the answer must be considered minus db.

When converting power gain to terms of db it is necessary to know the power input and power output of a tube. Transformers or other coupling devices may be ignored as they do not provide a power gain. It is possible to actually measure power input and power output if suitable equipment is on hand but as this is complicated it is recommended that these values be taken from a tube manual, where they are usually stated in the case of power tubes.

If the ratio of power output over power input is above one, and it almost invariably is, look up this value on the left-hand vertical scale, read across to the gain-ratio line and drop down to the power-db scale for the answer. Losses are handled on the dotted scales, as before, but using the power-db scale.

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Our "sister" paper, "Electrical Merchandising," now publishes an appliance service section.

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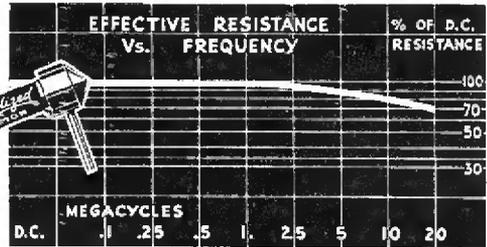
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100,000

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$db = 20 \text{ Log}_{10} \frac{\text{Mu}}{\text{Power output}}$
 $db = 10 \text{ Log}_{10} \frac{\text{Power input}}{\text{Power output}}$

10,000

1,000

100

10

1

0 10 20 30 40 50 60 70 80 90 100
 0 5 10 15 20 25 30 35 40 45 50
 Mu-db
 Power-db

Loss ratio

Gain ratio

SEE PRECEDING PAGE FOR EXPLANATION OF USES

FOR THE SERVICE MAN WHO MUST KEEP UP-TO-DATE

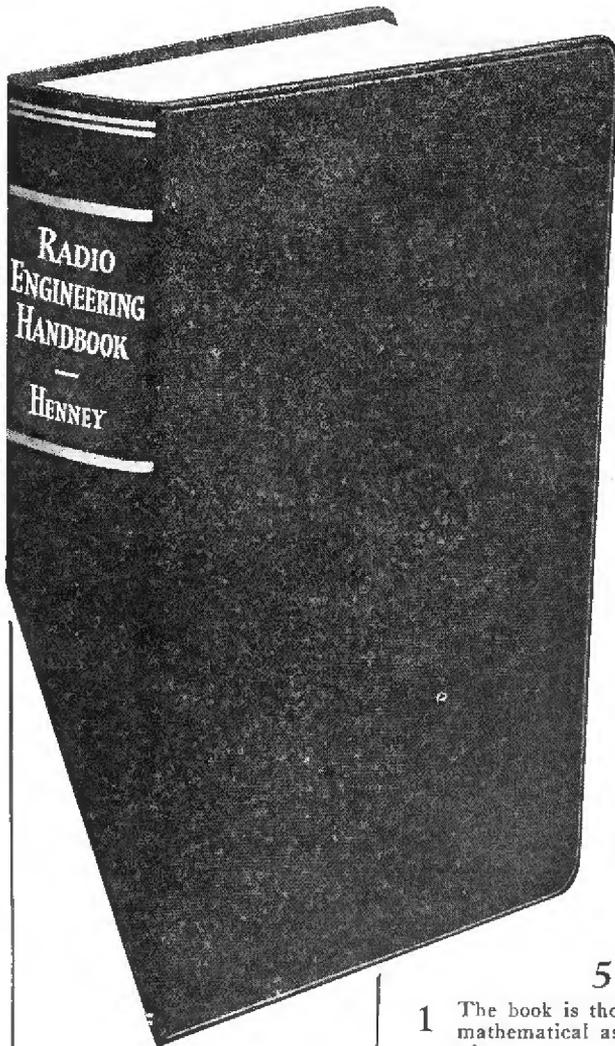


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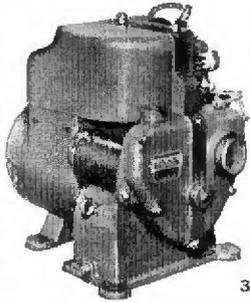
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27	— .28	58	— .44
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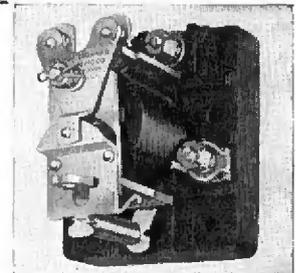
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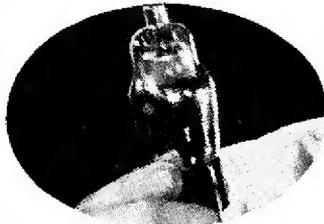
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THE SET-TESTED RADIO TUBE

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Tri-Shelvador Model F-43
 4.3 cu. ft. NET Capacity; 9.15 sq. ft. shelf area. 2 ice trays—42 cubes—one double-depth tray. Dimensions: 56-9/16" high, 23 1/2" wide, 23 1/2" deep. **\$139.50**

Tri-Shelvador Model F-55
 5.51 cu. ft. NET Capacity; 11.5 sq. ft. shelf area. 3 ice trays—43 cubes—one double-depth tray. Dimensions: 57 1/2" high, 28" wide, 24 1/2" deep. **\$164.50**

Tri-Shelvador Model F-70
 7.08 cu. ft. NET Capacity; 14.9 sq. ft. shelf area. 4 ice trays—41 cubes—one double-depth tray. Dimensions: 58 1/2" high, 32 1/2" wide, 25 1/2" deep. (Shown at left). **\$189.50**

EXCLUSIVELY IN

CROSLEY
 ELECTRIC REFRIGERATORS

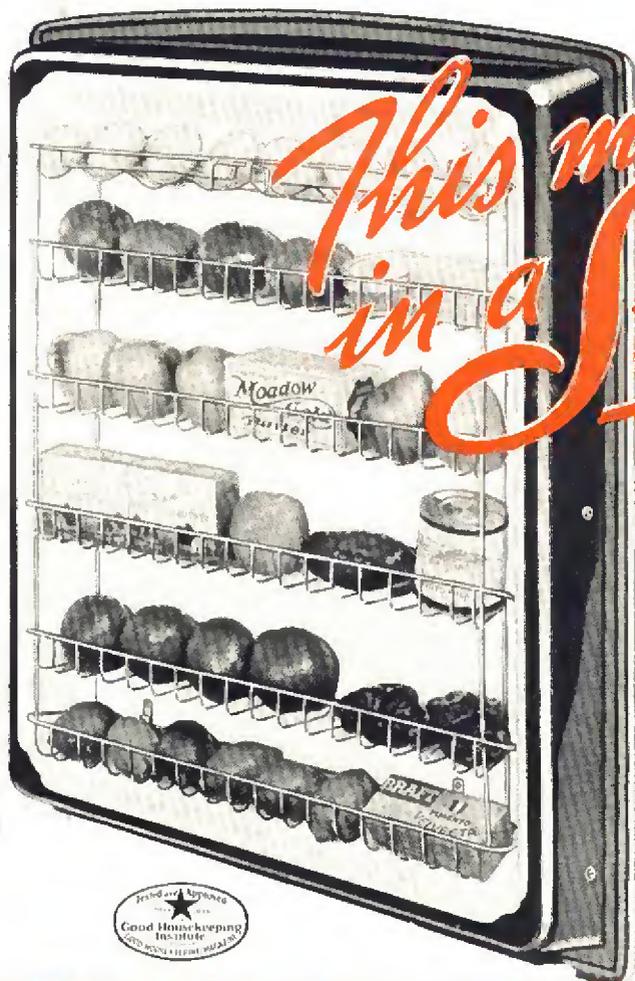
1935's MOST PROFITABLE WORDS

Crosley Tri-Shelvador Adds 3 Exclusive Features to Famous Shelvador

The Tri-Shelvador has all the features of the Shelvador, with the following added exclusive features:

- 1—**SHELVATRAY.** Handy shelf in door that drops to horizontal position. Place articles on Shelvatray and carry them (Shelvatray and all) to table, range, or cabinet. Saves time and steps. (Patent Pending.)
- 2—**SHELVABASKET.** A non-refrigerated basket on bottom of door for greens, carrots, cabbages and the like. An exclusive feature. (Patent Pending.)
- 3—**STORABIN.** A non-refrigerated bin in bottom part of cabinet for potatoes, onions, and other bulk items. Found only in Tri-Shelvador. (Patent Pending.)

In addition: Self-closing stainless steel door to freezing chamber in all Tri-Shelvador Models.



This much more in a Shelvador

THIS much more . . . twice as easy to find . . . the all-time high-point in electric refrigerator convenience . . . smartness that excites exclamations everywhere! No wonder sales are going up! up! UP! Shelvador—the electric refrigerator showing the greatest sales growth during 1934—will make new sales history during 1935. For SALES are written all over these amazing models that meet every viewpoint, every purse.

When you sell EXCLUSIVE features, you sell something beyond the reach of competition. And the 1935 Crosley line is exclusive, not only in features, but in Streamline Beauty and in foot-saving convenience. Far ahead in value. The prices speak for themselves. Get in touch with your Crosley distributor, so that you may begin now to make 1935 your biggest year. You can't afford NOT to handle Crosley.

THE CROSLEY RADIO CORPORATION

(Pioneer Manufacturers of Radio Receiving Sets)
 Home of WLW—the world's most powerful broadcasting station.
 POWEL CROSLEY, Jr., President CINCINNATI
 Western prices slightly higher.

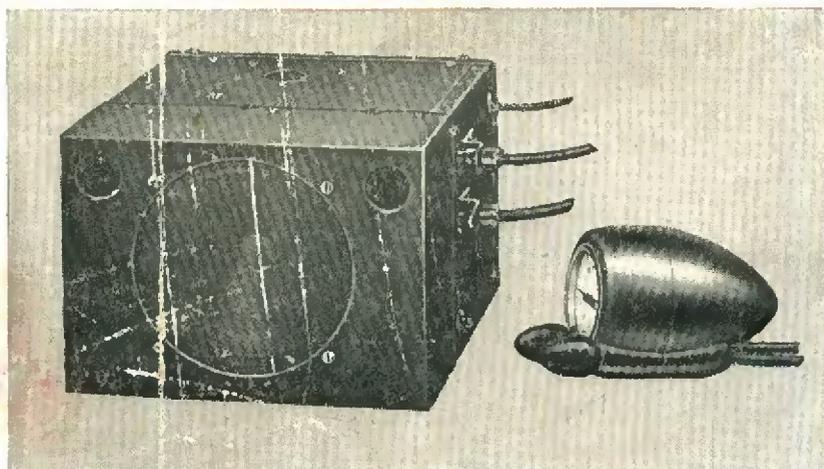


ALL PRICES INCLUDE DELIVERY..INSTALLATION..ONE YEAR FREE SERVICE

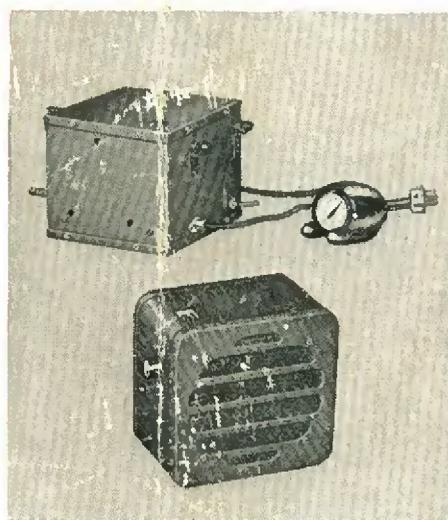
General Electric **ANNOUNCES**

2 ADVANCED NEW AUTO RADIOS Priced Right!

These two new G-E Auto Radios feature new developments which make possible an extremely low ratio of background noise to signal. They feature extremely easy elimination of motor noises. In many installations, in fact, noise suppressors can be dispensed with entirely. Attractive streamline steering post controls. The 5-tube model is equipped with speech control, especially desirable when travelling at high speeds. The receiver is also available for two-unit operation at a slightly higher cost. The D-72 is a Deluxe model built in two units. It incorporates a high-frequency tone control and unusually high output. It represents the most advanced development in auto radio today.



Model D-51, 5-TUBE SUPERHETERODYNE



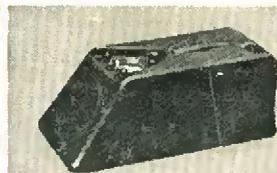
Model D-72, 7-TUBE SUPERHETERODYNE

THE G-E AUTO RADIO APPROVED INSTALLATION STATION PLAN is a most valuable aid to you in selling these G-E Auto sets. A nationwide organization of Installation Stations has been authorized to handle the work for dealers. You make the sale — the station makes the installation.

G-E provides adequate national advertising support with a campaign in The Saturday Evening Post, backed by smart promotional plans and materials.

Write for complete details.

These two new models are supported by four other popular G-E Auto Radio models shown below.



Model B-52, a 2-in-1 Receiver



Model C-41



Model C-60



Model C-61

GENERAL ELECTRIC

AUTO RADIO

MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT