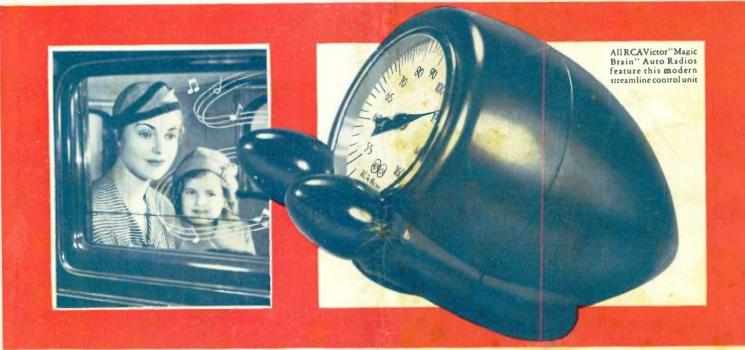
THE HUSKY RIGHT ARM OF THE CHAMPIONS AMONG DEALERS, JOBBERS AND MANUFACTURERS IN THE SEVEN ASSOCIATED INDUSTRIES

Radio Merchant RADIO · REFRIGERATORS · WASHERS · BUILTERS · APPLIANCES · RADIO TUBES · RECORDS · MUSIC



Here is the line that streamlines sales RCAVictor "Magic Brain" Auto Radio



NO SUPPRESSORS

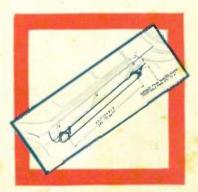
"Magic Brain" Auto Radios feature the built-in ignition noise-filter, making spark-plug suppressors unnecessary on most modern cars, simplifying and speeding up your insta tion. Another feature: "POWERTRON", which gives extra-tube performance.

Not one model, not two models, but six auto radios bear the RCA Victor name . . . Prices start at \$39.95, a puller-in that begins the sell-up process ... "Magic Brain" Auto Radio prices start at \$44.95, go to \$74.95... What a line!... No missed sales because prices were too high, no missed profits because they weren't high enough!... A model for everybody means maximum money out of auto radio this summer, the biggest auto radio summer you have ever seen ... Put the extraordinary "Magic Brain" to work for you.

All prices F. O. B. Camden, N. J., subject to change without notice.



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



rder

Editor

THE PERFECT ANTENNA

All antenna problems are solved by the new RCA Victor Di-Pole antenna, 96" folded to 48", fitting under run-ning board in a jiffy. Essential for steel-top cars and for roadsters and convertibles. Plenty of pick-up plus imerference reduction.

DISTRIBUTION ...

not

SATURATION

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

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

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

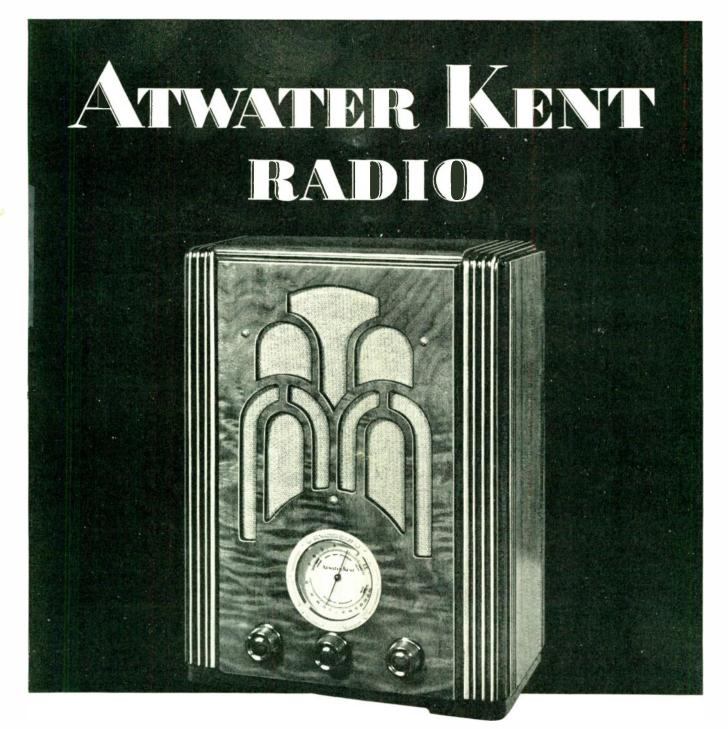
Write for the name of the nearest wholesale agent who will give you details.

TUNG-SOL RADIO TUBES, INC.

Sales Offices:

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

General Office' NEWARK, N. J.



A FORERUNNER OF 1936

Here is a smart, new radio.

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

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

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

Prices subject to change without notice.

ATWATER KENT MANUFACTURING COMPANY + A. Atwater Kent, Pres. + PHILADELPHIA, PA.



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

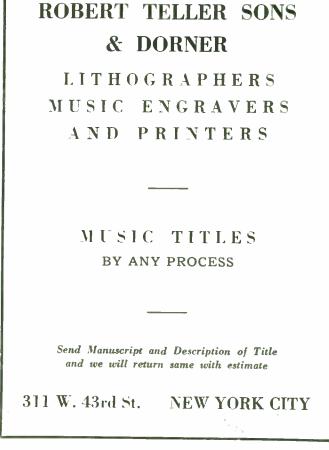
When a man owns his own store, you can bet he's proud of it. It's his business. His bread and butter depend on how well he does his job . . . on the customers he gets and holds.

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

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

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





STOP WORRYING ABOUT SALES

What are your plans for the next twelve months? Do you know that the sale of musical instruments and merchandise is way ahead of last year, particularly with accordions, guitars, flutes, mandolins, harmonicas, mutes, band instruments and accessories? Don't you know that in our trade paper. Musical Merchandise, we give all the latest happenings and "goings-on" in our trade, from Coast to Coast, covering all the essentials of for doing a larger and more profitable musical merchandise business? Don't forget we are panning the evils of our trade such as sell-



ing over your head to schools, supervisors at phoney discounts; that we are after chiseling jobbers and manufacturers who are not co-operating with you, and that our constructive effort in your behalf is worth \$8, for a subscription for 2 years. You need an organization like us working all the time to better conditions. Find out what is going on in Association work in all the cities, aimed to stop the tactics that must have hurt your profits during the past year. Not only do you get the livest news, information, data and alds for more profits, but you get all the announcements from all the manufacturers in the business . . . over 125 houses using our paper. Musical Merchandise, to inform the trade of their new goods, policies and co-operation. Let's get acquainted, for we want you to feel that we are for the dealer's success, first, last and evermost. And \$3 for 2 years is a trifle . . . you could drink it up in a few hours.

Musical Merchandise & Music Trade Review Radio City, 1270 6th Ave., New York. Glad. Henderson, Editor
If half of what you say Musical Merchandise will do for me is right, I'm sport enough to enclose \$3 for a 2 years test, and I'll promise to read the paper regularly.
My name is
Firm name
Street and Oity

33¹/₃¹/₆ More Sales Opportunities with this complete new line of **AMERICAN-BOSCH** Battery-Type **RADIO**



MODEL 376N—6 tubes including a current control tube. Improved Superheterodyne Battery Console De Luxe. Range, full standard broadcast band-540 to 1,600 Kilocycles. Semi-automatic volume control. Full vision calibrated dial; Reduction Tuning Drive; Dial shifts with battery switch to automatically indicate set 'on' or 'off'. Provides space for batteries within the cabinet itself. Its cabinet of a rugged and substantial beauty, is a triumph of design and workmanship. **569**90 PRICE, less batteries.

MODEL 386 – 6 tube, 8-tubeperformance, 3 band Standard Broadcast and short wave Superheterodyne Consolet. Range 530 to 1,720 Kilocycles with 1,700 Kilocycle Police Band. Second band 2,300 to 2,600 Kilocycles with 2,400 Kilocycle Police Band and short wave 5,800 to 19,000 Kilocycles containing the most important and most desirable short wave stations. Full automatic volume control. Sturdy, attractive cabinet. Latest cngineering improvements. \$5995 PRICE, less batteries ... 10 million unwired homes in the country—a third of all homes! Only 25% of farms have radio sets. A fertile field for your selling efforts...especially with farmers spending money again...and with this new complete line of battery type radios to quicken their interest!

These new American-Bosch sets are not ordinary, volumeproduction, "step-child" radios. On the contrary, they introduce typical American-Bosch elements of design which set new standards in battery radio reception.

Model 376N, for example, offers outstanding quality in tone, performance and appearance. It is indeed the battery radio de luxe. Model 386 brings round the world reception to the unwired home. Model 385 answers the need for a quality battery set at a low price.

All three models operate with air cell, dry cell or 2-volt storage battery. No matter what lines you are now carrying, get the full facts about these new American-Bosch Battery Type Radios. Mail coupon below today.

UNITED AMERICAN BOSCH CORPORATION SPRINGFIELD, MASS. New York Chicago Detroit American-Bosch Ra lio as licensed under patents and applications of R. C. A.

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	NAME	
	ADDRESS	
	CITY & STATE	



Breaking Sales Records AMERICAN-BOSCH Round - for - Sound CAR-RADIO \$4395 and \$4895

MAIL THIS COUPON ... no matter what radio lines you now carry

MILLIONS OF UNWIRED HOMES **NEED FOOD-SAVING REFRIGERATION TOO**





REFRIGERATOR

Rural Homes • Dairies • Summer Camps • Roadside Stands • Boats

ANY PLACE WITH-OUT ELECTRICITY...

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

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

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

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

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



F

Plenty food space in the Crosley Icy ball. Also adapted for bottles (wet or

dimensio 17''deep.

ICE FROM HEAT

Quality all the way through. Trouble-free operation. Complete silence. Unbelievable economy. Gross experity 1.3 cu. fr. NET capacity 3.5 cn. ft. Freezing tray makes 14 ice cubes, Gleaning white lacquer exterors, black-trimmed. Thoroughly insulated. Rub-ber gasket under lid. Outside dimensions: 28-1/10" high -including hardwaret, 411,2" wide (including hall), 245,3" deep. Inade dimensions: 19-13/16,7" high, 235,4" wide, 17" deep.

0. R

FACTORY

leyball freez-ing unit and stabilizer.

POWEL CROSLEY, Jr., President

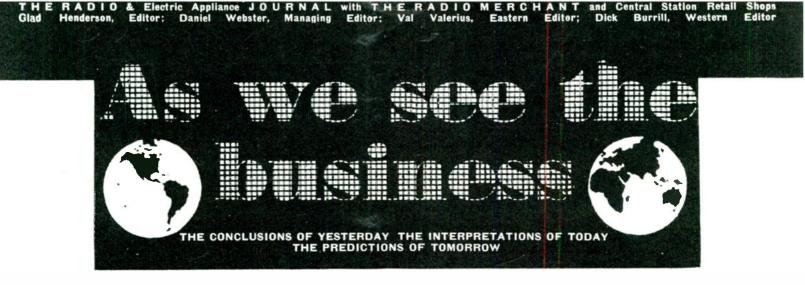
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n an en-tire day for only

for only

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

World Radio History



DEALER SOLD OUT AND REtired but after loafing now wants to get back into business. Spent some time with him looking for a store location in New York, and it is amazing how little one gets for \$500 a month with a store even in towns like Hempstead, Jamaica, White Plains, New Rochelle, Jersey City, and in spots of New York like 181st Street, Fordham Road, Pitkin Avenue, Brooklyn, etc. This dealer, who has made a success, believes that a store must be located in traffic; that canvassing isn't so hot, and that the percentage of visitors at stores with high rent is large enough, plus the advertising value of a good location, to "pay out" in leads and closings. He believes in small advertising, persistently done, in newspapers; the most capable salesmen he can get; the absolute elimination of drones, shirkers, motion picture hounds and chippy chasers; and he has a perfect horror of alibi artists, the genial hail-fellow-well-met nincompoop and the unreliable salesmen who promise everything to prospects for a two buck down payment.

HIS DEALER IS COMING BACK into the business, selling radios, refrigerators and washers but he is having a tough time getting the "proper location." Another man with a half-million bucks has been trying to become a wholesaler in the New York market for a year and a half, while another group of three men have been trying to get lines to job in New York for a year. It is amazing how difficult it is for able men to get into radio-refrigerator business—and how many squawkers there are now in the business who claim that it is impossible to make a profit.

UTILITIES TRYING TO SOLVE puzzle of those thousands who turn off the electric refrigerator during the winter months.

A LSO PUZZLE ON REFRIGERATOR sales existing today—not the public buying so far this year necessary to make the grade of over 1,500,000 refrigerators.

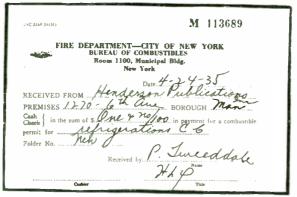


Published by Henderson Publications, Inc., Radio City, Rockefeller, Center, 1270 Sixth Ave., New York. Chicago: Richard E. Burrill, 664 No. Michigan Ave. 50c a copy, \$5 a year. Vol. XXXVIII, Number 5. May, 1935. "Sales" of new last year's models are successful at "discounts." Hope of hot weather starting sales stimulus will straighten things out.

A PPARENT INDICTMENT OF THE motor radio seen by the attitude of taxicabs users in New York, who seldom turn on sets. Last year, people wouldn't ride in cabs unless radio equipped. Proper explanation of this about-face would be of value in promoting motor radio by the trade. Motor radio selling well outside of New York.

A IR CONDITIONING IN PACKAGES is still snail-like, but the market is there and only awaits the product they want. Exploitative bungling of the term "air-conditioning" also responsible for public indifference.

AS I BURNED UP AT THIS dollar tap because we have an electric water cooler in the office? If one doesn't pay a dollar, the refrigerator is a "fire hazard"—but with the buck paid, it



ain't no fire hazard. Of course, no fire hazard in a wood house, but in a cementsteel building, it is mighty dangerous, unless you pay one \$. Millions of dollars for boon-doggling for aliens and loafers but smacking the refrigerator owners with a dollar tax is mighty clever. No thought of the fire hazard in burning up an editor with the bee put on for ten dimes.

THE SKEPTICISM OF OTICE dealers on buying sets from factories making for mail-order houses and chains, and the evident universal thumbs down on that type of radio? Yet the radio chain stores stick to well known advertised products, except for the small unknown sets for advertising purposes for store traffic. These two distinctive buying policies reveal that there are two divisions to retail radio work, the mail-order houses and outside chains estimated to sell about 1,000,000 sets for 1935 . . . over 25% of the business.

WELLS-GARDNER ARE PROBably the fourth largest maker of sets, making for M-W, Western Auto, etc., concentrating on sets 6-tubes and up. Belmont and Echophone make the smaller radio for M-W. Colonial makes the S-R radio, withdrawing from dealer field. About 250,000 for W-G, and about 150,000 for Colonial. Altho S-R does twice the general business of M-W, M-W in radio does about twice that of S-R. A factory selling, e.g., 100,000 sets to one house, doesn't look kindly to orders under 1,000 sets; and most dealers cannot and will not obligate themselves to such larger orders.

25% **OF** THE 1935 market evaporated by mail order chain houses two things are evident; that these houses realize the value of radio sales and profits and are pushing them, and that the radio dealers do not yet realize that the radio business is a good one and are hidebound to the past memories that "radio has gone to hell." Facts and figures indicate the necessity for more intensive work by the rank and file of radio dealers; a normal gain of 25% this year isn't to be secured sitting down and letting mail order houses cop the gravy.

OO BAD THE ACUMEN THAT PREvents dealers from buying and supporting factories making mail order house sets stops with buying. If that acumen could be directed to selling the radio sets, too, dealers could do much more business. Dealers are "entitled" to this business, but only if they are smart enough to get it. Making faces at mail order houses is a poor substitute for brushing off the cobwebs and making competition. People of your city who "condemn" the mail order houses, BUY FROM THEM in preference to radio dealers, only for one reason (lines and prices are about on par)—dealers doze.

H OW FRAGILE DISTRIBUTION IS; how costly to secure and how difficult to maintain! Less than 2 years ago, a radio manufacturer's distributor group (not Majestic) included the following high grade jobbers; which were scattered to other lines when the manufacturing failed:

Allen & Jemison Co., Tuscaloosa, Alabama Arnold Wholesale Corp., Cleveland, Ohio Louis A. Bailey, Inc., Salt Lake City, Utah B & O Radio, Inc., Newark, New Jersey Bee, Inc., Allentown, Pa. Bigelow & Dowse Co., Boston, Mass. Buffalo Talking Machine Co., Buffalo, N. Y. Charleston Kelvinator & Appl. Co., Charleston, W. Va. City Electric Co., Syracuse, N. Y. Coast Electric Co., San Diego, Calif. F. B. Connelly Co., Seattle, Wash. r. b. connenty Co., Seattle, Wash. Dakota Electric Supply Co., Fargo, N. D. 555, Inc., Little Rock, Ark. Fort Smith Radio Co., Fort Smith, Ark. Front Co., Wheeling, W. Va. Gambill Distributing Co., Nashville, Tenn., and Memphis, Tenn. J. Edmunds Galloway, Baltimore, Md. Glasgow-Stewart Co., Charlotte. N. C. F. R. Gooding Co., Wilmington, Del. Harger & Blish Co., Des Moines, Iowa The Harten-Knodel Dist. Co., Cincinnati, Ohio Intermountain Appliance Co., Denver, Colo. Interstate Electric Co., Shreveport, La. Manufacturers Distributing Co., Dallas, Texas Mathews Refrigerating Co., Montgomery, Ala. McLendon Electric & Radio Co., Waco, Texas Motor Equipment Co., Kansas City, Mo. Nelson Radios & Service Co., Mobile, Ala. North Coast Electric Co., Portland, Oregon Oakleys, Boise, Idaho Paxton & Gallagher Co., Omaha, Nebr. Radio Distributing Co., Detroit, Mich. Radio & Refrigeration Co., Greenville, S. C. Roberts Toledo Coo., Toledo, Ohio Sampson Electric Co., Chicago, III. Sherrod Bros. Hardware Co., Lubbock, Texas C. B. Scott Co., Scranton, Pa. Shadbolt & Boyd Co., Milwaukee, Wis. Southern Radio Distributors, Inc., Tampa, Fla. Stauffer Eshleman Co., New Orleans, La. Stevens Radio Sales Co., Miami, Fla.

Stratton & Terstegge Co., Louisville, Ky. Straus-Bodenheimer Co., Houston, Texas Thurman & Boone Co., Roanoke, Va. F. Tiemann Stove Co., St. Louis, Mo. Time Appliance Co., New York, N. Y. Towers Hardware Co., Jacksonville, Fla. Tracy-Wells Co., Columbus, Ohio Tristate Electrical Supply Co., Hagerstown, Md. The Troy Electric Co., Inc., Troy, N. Y. Virginia Auto Supply Co., Richmond, Va. Isaac Walker Hardware Co., Peoria, III. Winne Sales Co., Minneapolis, Minn. Wholesale Radio Supply Co., San Francisco, Calif. Winerich Motor Sales Co., San Antonio, Texas Zweifler, Inc., Harrisburg, Pa.

FIGURING THE COST OF ACQUIRing a good jobber at \$1,500 each, these 56 distributors cost at least \$84,000 to get, minimum. A manufacturer starting business today would be willing to pay \$100,000 for active work of this group "over night." Each jobber (average) must have 6 wholesale salesmen, so there would be 335 wholesale salesmen "selling" at once, to at least 10,000 dealers, a force of exceptional potency for getting business.

OSING THIS JOBBER GROUP IS AN example of extravagance that figures no where on the balance sheet, and no referee considers the list worth a dime as an asset, surprising as it sounds. Doesn't the foregoing prove that no manufacturer's distributors put him out of business—that two or three foolish moves in a mental fog of "superiority" is all that is needed to floor him with cramps suzettes?

AYOR OF NEW YORK QUITE disturbed at bids for fire hose submitted by all manufacturers being identical in price; prices were identical for a year. We congratulate the fire hose makers for sticking together. There can't be codes on one hand with companies sticking together, and different prices on the other hand. Too bad the radio, refrigerator, washer boys cannot take a lesson from so prosaic a thing as fire hose.



One half the time One tenth the effort But only 4% sold.

ripe

is the ironer market today with only 4% sold. low-priced models and "no cost" operation

BY DANIEL WEBSTER



IGGEST profit in any line of merehandise is made by those who feature it at the time that it really begins to "click". Too early means too much pioneer work, and too late means too much competition. With almost every appliance it appears that there is first an introductory period when manufac-

turers and some dealers are trying to stimulate popular interest. Follows a rush of sales so big that manufacturers and dealers sell faster than they can ship. This huge demand doubles the number of sellers in the field and trins the individual profit. It is the dealers who recognize the time of the second period who make the most money.

Indications point to electric home ironers as one of the fastest coming major appliances. According to Hurley Machine Co., makers of the Thor, over 95% of all wired homes have no electric ironers. Although only five per cent of the potential market is sold, that one-twentieth is animating the whole market with interest. Daily there are stories in newspapers and home magazines featuring the case of home ironing. Progressive home owners have their washers and refrigerators and the housewife is thinking of an ironer. When a company such as Hurley, which has long been one of the outstanding washing machine manufacturers, decides that it is time for aggressive exploitation of the ironer, it would seem that the harvest is prepared.

Nothing sells any appliance better than word-of-mouth advertising. When Mrs. Brown boasted to Mrs. Green about her new washer, Mrs. Green schemed to buy herself a washer. Today there are enough Mrs. Browns boast ing about their ironers to create desire in the minds of thousands of Mrs. Greens.

Analysis of the use in the home of an ironer shows what

can be expected of the market. To begin with, ironers are now priced within the reach of any owner of a wired home. Hurley even offers a model as low as \$39.95 that can build sales in volume for dealers advertising it.

Big advertising on this model is bound to bring in crowds of prospects who have always thought an ironer beyond their pocketbooks. In the same line, there are Thor ironers as high as \$195, so the individual dealer has plenty of build-up opportunities.

Who will buy ironers? One answer is indicated in the figures which show that 75% of the women who own no washing machine are doing their own ironing. Many a family sends out its laundry for washing, but does its own ironing. In these homes, the most laborious job of the week is the ironing. When the skilful salesman paints a picture that shows the housewife sitting before an ironer as she might sit before the piano, taking her ease while her hardest work practically does itself, and spending no more money to do it, sales are bound to soar. The difference in cost between operating a small electric ironer and a hand electric iron is negligible. The price of the ironer today is secondary. The housewife has nothing to lose and her own comfort to gain.

What does the low-priced ironer offer? Taking the Thor \$39.95 as an example, here are some of the many features: Easy, safe finger-tip operation. Convenient heat control. Special lever for pressing. Chrome plated shoe. Full open-end, non-packing roll. Simple mechanical construction. Locking front casters. Improved ironing position. Large sturdy table. New simplicity in operation. Even a porcelain cabinet cover can be furnished to convert it into a valuable kitchen table. When all this is offered in addition to effortless ironing days, the dealer certainly has a sales story with a wallop.









A SPECIAL MESSAGE TO REFRIGERATOR DEALERS

DEPENDABILITY, For 33 years the name "Atwater Kent" on a product has been accepted as the "half-mark" of quality and dependability. This name has become justly famous for excellence of workmanship, rigid standards of inspection, and infinite care in all details of manufacture. This reputation for dependability is the assurance that Atwater Kent Refrigerators meet the same rigid standards of excellence. It is the pledge of real performance...a refrigerator that will operate efficiently and economically.

World Radio History



Prices subject to change without notice.

ATWATER KENT MANUFACTURING COMPANY -> - A, ATWATER KENT, PRESIDENT -> - PHHADELPHIA, PA,





to give the prospect the price and performance he wants





Zenith Model 668 6-tube superhetero-dyne, 8-inch separate dynamic speaker. \$54.95

Zenith Model 666 6-tube superhetero-dyne. 6-inch dynamic speaker. \$19.95

Investigate!

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



Zenith Model 664 5-tube superheterodyne. 6-inch dynamic speaker.

TEAR OUT NOW - MAIL LATER

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

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



World Radio History

12



GENERAL

radio publishes concise new catalog

Usually fine catalog is the new "H" book released by General Radio Co., Cambridge, Mass. New is the quick index which brings anything in the 189 pages immediately to the readers. This index lists: "How to Order," "Industrial Devices," "Resistors," "Condensers," "Inductors," "Frequency and Time Measuring Devices," "Oscillators," "Amplifiers," "Bridges and Accessories," Standard-Signal Generators," "Meters," "Power Supplies," "Parts and Accessories," Each listing is keyed with a black arrow. By ruffling the edge of the pages, the actual page containing the desired information can be seen at a glance.

In a foreword, General explains its policy of selling direct as best suited to maintaining the necessary contact between its engineers and its customers.

VIBRATOR

correspondence course by Radiart Corp.

Correspondence course for servicemen covering theory, design and practical servicing of automobile radio power supply circuits is offered by The Radiart Corp. at mailing costs. Course covers every type of vibrator, with details of the associated circuits, parts of the circuit and practical service hints.

PARTS

for refrigerators offered by Borg-Warner

A complete line of parts and accessories for all makes of refrigeration and air conditioning units is now being offered by the Borg-Warner Service Parts Company, a division of Borg-Warner Corporation, according to an announcement by A. C. Darling, vice-president and general manager. All parts and accessories for the new lines are now being stocked at the BorgWarner warehouse, 121 East 21st Street, Chicago, and are available for rapid delivery to service organizations in Indiana, Illinois, Michigan, Wisconsin, and Iowa.

The refrigeration and air conditioning parts and accessories will eventually be warehoused in each of thirteen location, Mr. Darling said, and will serve the trade on the same nation-wide basis that the automotive parts business is now conducted.

MUTER

all-wave coupler provides inexpensive doublet

Muter Company of Chicago has added a new all-wave tuning coupler to meet the demand for an efficient yet inexpensive unit to match up any radio set with a doublet antenna system of the type now meeting with widespread approval. With the Muter device, complete, simple instructions are included for home construction of an inexpensive doublet antenna using insulators and wire such as may be found in any dealer's store.

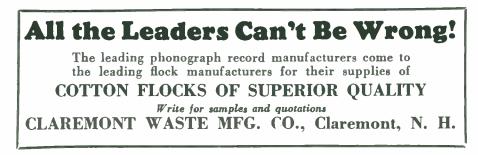
The Muter Tuning Coupler is equally efficient on both the short wave bands and the 200 to 550 meter broadcast band. Changeover from short wave to broadcast reception is accomplished instantly by means of a simple switching arrangement climinating the necessity of changing connections in any way.

SHERWOOD

now general sales manager of Cardwell

Charles M. Sherwood, well-known radio executive, has been appointed general sales manager of the Allen D. Cardwell Mfg. Corporation, pioneer variable condenser makers, of 81 Prospect Street, Brooklyn, N. Y.

For six and a half years Mr. Sherwood was Eastern sales manager of F. A. D. Andrea, Inc. He was one of the founders of Shipowners Radio, Inc., in 1919, and was an active amateur as far back as 1910. He brings to the Cardwell company an unusual background of knowledge and experience that he will apply to the promotion of the firm's products.



RESISTORS

One of our subscribers writes us: "I have been much interested in some articles in various radio papers on the effect of porosity on moisture absorption in carbon resistors. I can readily see that a closegrained structure free from voids would naturally be more homogenous and less liable to damage.

"On the other hand, under anywhere near average conditions, are not other factors even more important? The variation of the resistance due to temperature coefficient of the material used, and the heating under load, for example, might well overshadow or offset the effect of the grain structure. It also seems to me that this point would have comparatively little effect on the slow change of resistance due to intermittent overloading of the resistor. In fact, it seems to me that practically all manufacturers of carbon resistors would have long since recognized the need for homogenous structure, and that the tendency would now be to lay stress on the actual performance characteristics rather than on the construction.

"If I am wrong, which is quite possible, perhaps someone of experience in resistors, will put me straight through your columns. Thank you."





save clever service men thousands of dollars when the equipment and knowledge is complete

By ARNOLD GOULD and OTTO BIRKELAND



INCE the development of the superheterodyne, AVC and automatic suppressor circuits, or as sometimes referred to, "squelcher circuits," the testing and "trouble shooting" of the present day radio has led to the need of better and more accurate testing methods.

Many instruments hitherto unused by the radio technician have taken their place today as the foremost means of "trouble shooting."

CONTINUITY AND VOLTMETER

The continuity and voltmeter combine is one of the most important instruments in the hands of the radio technician. The intelligent use of this instrument is a rapid fire method of locating shorted by-pass condensers, open or changed value resistors and the tracing of cabled leads.

While there are many forms of this instrument, a few of which are undoubtedly known to every technician, the one most commonly employed is that shown in the schematic diagram figure (1), and a few short cuts in "trouble shooting" with this instrument is worth mentioning.

A common cause of distortion and fading, is the drawing of control grid current by the tube, especially in circuits having a high resistance grid return. The current can be indicated by shunting points (1) and (2) in figure (2) with a low range high resistance volmeter. A slight scale deflection is an indication of this condition.

A further use of the voltmeter is as an indication of the proper functioning of the superheterodyne oscillator

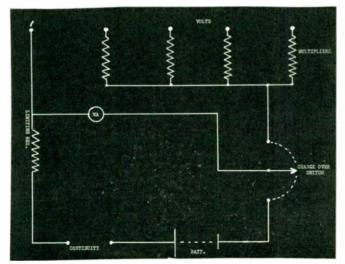


Fig. 1

circuit. This check can easily be made by placing the test prods from control grid to cathode, rotating the tuning gang and watching for a voltage change on the voltmeter scale. A variation in the scale reading indicates the oscillator circuit as functioning.

ALL-WAVE OSCILLATOR

The need of an all-wave oscillator is apparent to anyone who has at any time tried to align an all-wave superheterodyne, for without this instrument proper alignment is an almost impossible task.

Quite a frequent complaint on sets is "hum on station." This condition, if due to the set itself, can be readily disclosed by using the oscillator with an unmodulated carrier. This can be accomplished by shorting out the grid leak, and condenser on the oscillator, or in those using a separate modulator tube, cutting off the grid prong of the modulating tube. The resulting carrier wave is fed into the set in the usual manner and upon tuning the set to the oscillator frequency, the result will be a hiss, and where tuning indicators are used, an indication of signal.

Likewise, the above unmodulated signal may be fed into the first detector of a superheterodyne having a suspectedly dead oscillator circuit. Set the radio dial to a known station, and rotate the oscillator dial until a signal is heard. Operation under the above condition is an indication of a defective oscillator circuit in the set.

CAPACITY METER

The large number of capacitors used in the present day radio, has brought forward the capacity meter to a place of prominence in the radio repair laboratory.

Essentially in construction, the capacity meter is nothing more than an A.C. Milliammeter with the proper multipliers, and a scale to read directly in microfarads. This reading, however, is not strictly speaking a true capacity value, but the impedance of the condenser at the frequency of the power supply being used. Calibration of the scale is readily made by obtaining the readings on several known capacitors and plotting a graph for the intermediary capacity readings, or for those more inclined to do so, the

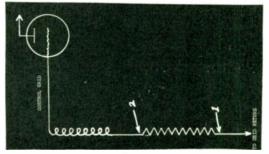


Fig. 2

VIM'S

test bench, with Larry Silverman in charge, has all the equipment mentioned in this article including the cathode ray oscilloscope. Vim conducts one of the largest and most efficient service departments in the country and knows that the costs are lowest when only the finest and most complete equipment is used.

Above Vint's bench is the tube Voltmeter. Left of the panel is micro animeter and right is the Wheatstone Bridge. On the bench is the tube checker and the all-wave oscillator. Meters across the panel are: AC meter for line voltage, AC meter for filament voltage, DC milliampere meters, microfarad meter, direct-reading voltmeters.



readings can be so marked on the scale directly in microfarads as done with commercial units.

Perhaps the greatest use of the capacity meter is for the checking of leaking condensers, so commonly encountered in sets today. Leakage is indicated by an abnormally high reading, far over the rated value as stated on the unit. Conversely, no reading on the meter, indicates an open condenser.

MICROAMMETER

Where it is impossible to correctly check low capacity condensers for leakage, the microammeter used as an ohmmeter, will always show up the defect, the reading on the scale being interpreted to resistance by formula. Mica and paper condensers should not have less than fifty (50) megohms of resistance.

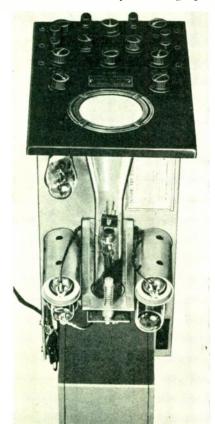
TUBE TESTER

Discourse upon the tube tester is unnecessary as every technician is familiar with this testing device. The operation depends much upon the individual unit, and close observance of the manufacturers instructions is imperative to satisfactory operation.

VACUUM TUBE VOLTMETER

Here is an instrument with which much can be done if properly understood. Fundamentally, the V. T. Voltmeter consists of a detector unit with a milliammeter in the plate

RCA Cathode Ray Oscillograph



CATHODE-RAY

oscilloscopes cut trouble shooting time in half by allowing service men to look into any circuit and actually see all conditions. Important particularly to the alignment of r-f and i-f circuits, these instruments are widely used by radio manufacturers for factory testing. Models now on the market are priced under a hundred dollars and are invaluable to service men.

circuit. Innumerable measurements are possible with this device, but only one will here be discussed. It's most important and common use, is for the measurement of grid bias in circuits employing AVC and QAVC. Since the V.T. Voltmeter consumes no current in operation, the resultant readings are true values of the impressed voltages. Thus it becomes apparent that much of the guess work in radio can be eliminated, and the technicians art brought down to a scientific basis.

WHEATSTONE BRIDGE

Where extreme accuracy in resistance measurement is required, no instrument surpasses the Wheatstone Bridge in performance. The greatest use of the bridge to the technician is in the testing of coils for shorted turn, and for high resistance connections on wave changeover switches.

MILLIAMMETER

The uses of the milliameter are many, and of such a nature as to be of great assistance in simplifying the task of repairing. Inserting the milliammeter in the plate circuit of a tube and checking the result against the tube manufacturers specification, is an infallible method of indicating satisfactory operation of the particular circuit. This method is of a special use in localizing audio distortion. By starting at the detector circuit and following through to the output, the source of trouble will be found to be localized in one particular stage.

Another use, is an ouput meter. By inserting the meter in the plate lead of the detector tube, 2nd detector in supers, peak resonance will be indicated by an increase in scale reading on grid leak type detectors, and a decrease on power detectors.

A. C. METER

The performance of a tube is dependent upon its filament voltage, for unless operated at a specified potential, much distress will result. Not only will the tube perform poorly, but its material life will be greatly shortened. The A.C. Meter here comes into use, being used to accurately check filament voltages under actual operating conditions. LINE METER

Line voltage is of importance in the life of the power transformer and condensers in addition to actual operation of the set itself. One such case was recently encountered where the set was dead over half of the tuning band due to failure of the oscillator circuit to function. When brought into the shop, the set was found to be O.K. in every respect, yet when delivered was still dead over half the dial. Observance on the servicemans part of very dimly lighted tubes caused him to check the line voltage. The voltage was found to be quite low, and when an auto-transformer was installed, the set functioned perfectly over the entire band, in addition to improve tone and volume.

World Radio History

QUALITY FACTOR

eclipses 'price' as main radio sales—Ben Abrams

Price, as a main factor in radio selling, is considered by Ben Abrams, president of Emerson Radio & Television Corp., New York, as a less important force today, than at any other time in the recent history of the radio business.

Mr. Abrams said that too much attention was given to price in the radio industry, but due to the improved public conditions throughout the country, the substitute factor of quality is so far exceeding the value of price, that these companies using the quality power are showing the best results.

"Too frequently does an industry or an individual fail to change with the outside influences that actually govern sales and profits," commented Mr. Abrams, "and the continued promotion in improved times of ridiculously low-priced radio, is actually throwing away a potential volume

CORWIN

appointed advertising manager for Raytheon tubes

Charles I. Corwin has been appointed advertising manager of Raytheon Production Corp., according to A. Zinkan, assistant general sales manager, effective May First. Mr. Corwin was with National



Charles I. Corwin

Carbon for ten years in the radio, advertising and sales promotion divisions. More recently, he has been engaged in editorial work. His duties will include directing the advertising for Raytheon tubes for the New York, Newton, Chicago and San Francisco offices of the company. Albert Λ , Bombe is another recent addition to Raytheon, having been appointed assistant to Mr. Zinkan.

of business. Many customers today are buying for example, a \$39.95 set, whereas a year ago, these same people would have demanded a \$19.95 set. Now they have the money to pay for the higher-priced instrument. By the same token, a group that bought \$39.95 sets last year can now buy \$69.50 sets, and so it goes, with a widening of clientele for sets at increased prices.

"I believe that dealers should aim, first, to satisfy their customers by appraising their radio necessities at the proper prices, and, then, selling them a quality set to meet these conditions. Those who are doing this, are making money, but due to the advertising of \$7 sets, there is still an atmosphere of relief that the public prices of radio sets have come way down, and it is up to the dealer to dispel this illusion when he is able to talk with his customers."

MAY

moves headquarters from Newark to New York

May Radio & Refrigeration Corp. has moved its plant and showrooms from Newark to 24-28 University Place, New York City, D. W. May, president, informs us. This move gives better handling of both Metropolitan sales and export activity. Personnel of the organization has been expanded with the addition of Irving A. Ponon to contact chain and department stores. D. W. remains president and treasurer, with Frank Squire as vice-president in charge of manufacturing and engineering. The Metropolitan sales crew remains.

An exclusive export contract has been signed by May with Kahn & Nathan, exporters, who also operate under the name of Construction Supplies Co. The organization handles foreign sales for such well known manufacturers as Kochler Plumbing Products, Jones & Laughlin Steel Co., Chase Brass and others. They expect to develop immediate foreign business for May radio and refrigeration.

KELSEY

joins Stewart Warner for special sales work

L. L. Kelsey has joined the sales staff of Stewart-Warner Corp. For the time being his duties will be special sales work under John F. Ditzell, sales manager on these products. For the past two years, Mr. Kelsey has been with Zenith introducing that company's products to the automotive field and is credited for both Ford and Hudson using Zenith auto radio for some time. Previous connection was with Grigsby-Grunow where, for three years, he was on special sales work and auto radio.

FADA

appoints Sprague Electrical Connecticut distributor

Sprague Electrical Supply Co., of Connecticut, is newest addition to leading distributors enrolling under the Fada banner, reports L. J. Chatten, Fada's general sales manager. Other recent additions include such well known organizations as: E & L Battery & Ignition Co., Newark; Wyeth Hardware & Mfg. Co., St. Joseph, Mo.

Sprague will travel eight field men in the Western Connecticut territory from its headquarters in Waterbury and branch in Bridgeport, with large demonstration and display rooms in both eities. "Main reason Sprague selected Fada", says Mr. Chatten, "is that our High Fidelity merchandise showed to exceptional advantage on their special High Fidelity station in the Waterbury district. The ability of our line to take advantage of this special High Fidelity station to the fullest was greatly responsible for their decision."

Fada's line now includes a very complete line of AC-DC portable models as well as straight models and the "Super High Fidelity Reproducer."

TRIAD

higher tube lists offer bigger dealer profit

Maintaining higher list prices solely for the benefit of the retailer, Triad Mfg. Co., Inc., points out that its tubes are wholesaled at competitive prices. In other words, the entire difference in list is additional profit for the seller.

Edward R. Fiske, general sales manager, suggests this is particularly important to the service man and radio service organization. He shows that the average service establishment in a small town must lay out about \$3,000 a year to conduct business, which means almost \$5 a service call for basic cost. Since tubes are the most important item sold by service men, he adds that it is imperative that each tube so sold must bring in the highest possible profit.

WARREN

offers free catalog of screw cabinets

J. D. Warren Mfg. Co. offers to send free folder No. 25 illustrating twenty-five most practical screw cabinets to anyone interested in sectional cabinets for use in store, factory or laboratory for screws, bolts, butts, washers, cap and set-screws, plugs, electric bulbs, sockets, fuses, terminals and small radio parts.

BUFFALO

RCA distributor moves to larger quarters

New York Talking Machine Co., RCA distributor in Buffalo, N. Y., has moved into more efficient headquarters at 769 Main St. The telephone number, Washington 0516, so well known to most Buffalo dealers, remains the same.



PROMINENT MEMBERS of the Seven ASSOCIATED INDUSTRIES

A Portrait Series Published in the RADIO & ELECTRIC APPLIANCE JOURNAL



MAY, 1935



World Radio History

RADIO & Electric Appliance JOURNAL for May. 1935

CHINESE

passersby read "Zenith" in two languages

Scientific Service Co. (Henry Tseng, manager), 142 Museum Road, Shanghai, China, believes in outdoor advertising. In typical Chinese fashion (noted for a degree of intuitiveness beyond that of American women) "heavy traffic spots" were selectcd—(these seldom coincide with the traditional American spots,—Chinese editors, please copy) and here were erected large Zenith radio posters telling the Zenith Message in both English and Chinese, for the Anglo-Saxon and Oriental passerby respectively, to be sure.

It is very interesting to note from this photograph, evidence that Chinese billboards run from left to right.



Different than American are favored billboard spots

HIGHER

prices for Emerson auto radio models

Emerson Radio and Phonograph Corporation announced the establishment of new prices on the basis of the number of operating tubes used in their receivers. Effective May 10th the Emerson Model $6\text{-}\Lambda$, previously listed at \$39,95, is priced at \$44.95 retail. Model 5-A, before \$44.50, is \$49.95.

The new Emerson Models are so designed as to make spark plug suppressors unnecessary and are fortified against road shocks, dust, heat, cold and humidity. Both sets are housed in attractive modern cases. A striking feature of the de luxe model is its completely die-cast case which overcomes the effects of car vibration and consequent rattles. Both sets can be used in all of the new automobiles, including the steel top bodies.

MYSTERIES

broadcasts by Ken-Rad now on Sunday nights

Since April 28th, Ken-Rad "Unsolved Mysteries" program is broadcast from WLW on Sunday night at 10 o'clock E. S. T. This was a change from Thursday night at 9:30 E. S. T. The program is in its third year of broadcasting wholesome and interesting mystery dramas to the radio audience. Solutions to these mysteries are received every week from almost every state.

Ten complete sets of Ken-Rad radio tubes are given away each week to those who submit solutions which are closest to the correct solution.

BENNY

Goodman with new newness on Victor records

"New style, new dash and zip, new treatment that puts some decidedly new wrinkles into fox trot rhythm" is the manner in which Victor's new Benny Goodman records are announced to the trade. Benny has come up suddenly and has been rousing amazing enthusiasm, both among those who know their orchestras and those who just know their dancing. First record has "Hunkadola" on one side and "The Dixieland Band" on the other. It's a natural to demonstrate to anybody who asks for any dance record.

"Up-to-date"

KEN-RAD Radio Tubes embody every proved and worthwhile refinement. They are always the "last word."

Their superior quality and dependable long life satisfies customers, builds greater profits for dealers.

Our free twenty-page, illustrated brochure, "Facts About Ken-Rad" gives the complete story. Send for it.



THE KEN-RAD CORPORATION, Inc., Owensboro, Ky. Division of The Ken-Rad Tube and Lamp Corporation Also Mfrs. of Ken-Rad Incandescent Electric Lamps

en-kac

DEPENDABLE

LONG LIFE

RETAIL SALES MANAGER Wants this kind of a Job

I want a job as General Sales Manager of a large retail organization selling pianos. radio. musical merchandise. refrigerators and washers. and perhaps sound amplification systems---

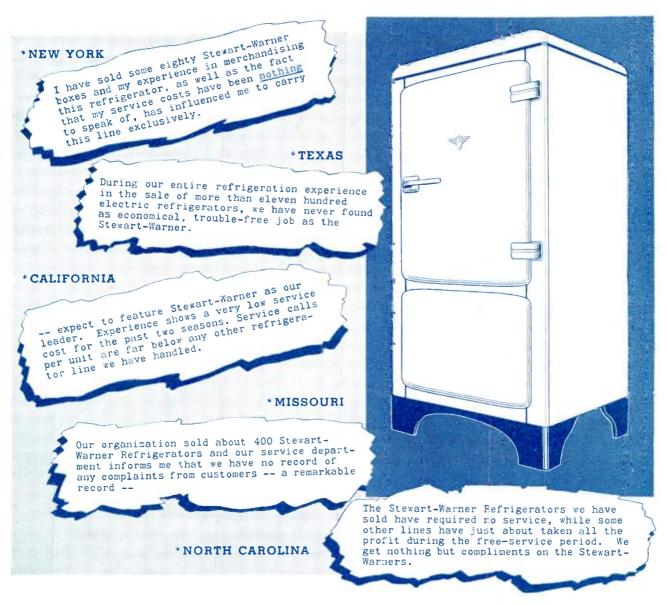
Or with a manufacturer who wants productive retail cooperative work with wholesalers and dealers.

Commission basis arrangement preferred or a small salary with a minimum accomplishment. and commission over that amount.

I am experienced and know my business, with a record of results with highclass concerns that indicates a continuance of my success with your company.

Address, in confidence, "Sales Manager." care of RADIO JOURNAL, 1270 Sixth Ave., New York.

STEWART-WARNER SAFETY-ZONE REFRIGERATION IS ROLLING UP PROFIT AND PERFORMANCE RECORDS EVERYWHERE!



WITH the bulk of the season's refrigeration sales still to be made—now is the time to make sure of the big profits of another great Stewart-Warner year. By getting in touch with your distributor immediately, you can quickly make arrangements to sell Stewart-Warner Safety-Zone Refrigeration and *keep your profits* instead of feeding them back in servicing costs—cash in on proven dependability.

The matchless Slo-cycle mechanism that has caused dealers everywhere to call Stewart-Warner Electric Refrigerators "the line without a service problem" will make your retail profits NET. And your distributor has a dealer plan you'll like. Phone, wire or write him now, or communicate with us direct.

STEWART-WARNER CORPORATION 1845 Diversey Parkway Chicago, Illinois





SUPPORT J L L I V ARVIN MODELS AS COMPLETE AND POWERFUL AS THE NEW ARVIN MODELS

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

Beautiful, full-color "bleed" pages in The Saturday Evening Post are telling your prospeets about Arvin-the magnificent performing car radio which is now available in six fine, new models, five to eight-tube sets, priced for you to sell from \$37.95 to \$61.95. And with all this, Arvin gives you an all-inclusive line-up of selling helps to link you up with the most impressive consumer advertising campaign on car radio. A wide variety of effective displays-tieup newspaper advertisements-mailing cards -circulars-a complete sales manual-and big poster reproductions of the beautiful four-color Post pages-in fact, everything is ready for you to cash in on your "sweetest opportunity" to profit on car radio. See your jobber now for full information on complete Arvin Car Radio line and the business-building program behind it.

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



New Arvin Special Model 17-A Tailor-Made for 1935 Fords. Powerful 6-tube superheterodyne. Overhead speaker mounts above the windshield. Airplane-type dial clamps in ash tray opening and matches the instrument panel perfectly. All new Arvins fit beautifully in 1935 Fords—but this model is custom-844.95 list built for them. Models 17-B and 17-C with overhead speaker and custom-built panel control for Chevrolet, Oldsmobile, Pontiac, Plymouth, Dodge, Chrysler. \$15.95

THESE SPECIAL ARVIN MODE LETE FROM SETS PR CED FINE

One of a series of four-color "bleed" poses appearing in "bleed" poses opporting it The Saturday Leming Post

837.95 TO 864.95



awin The Magnificent - Car Radio

New Arvin Special Model 7 For All Makes of Cars. 5-tube superheterodyne with airplane-type remote

control for steering column or instrument panel and the many distinctive Arvin features that simplify installation and service. The car radio to sell those who want the magnificent per-