

RADIO TODAY

Yearly

Caldwell-Clements, Inc., 480 Lexington Ave., New York, N. Y.

15 Cents a Copy

This Auto-Radio
Business Belongs
to You!

The 1937 Auto-
Radio Sets

How to Save on
Income Tax

The Right Location
for Your Store

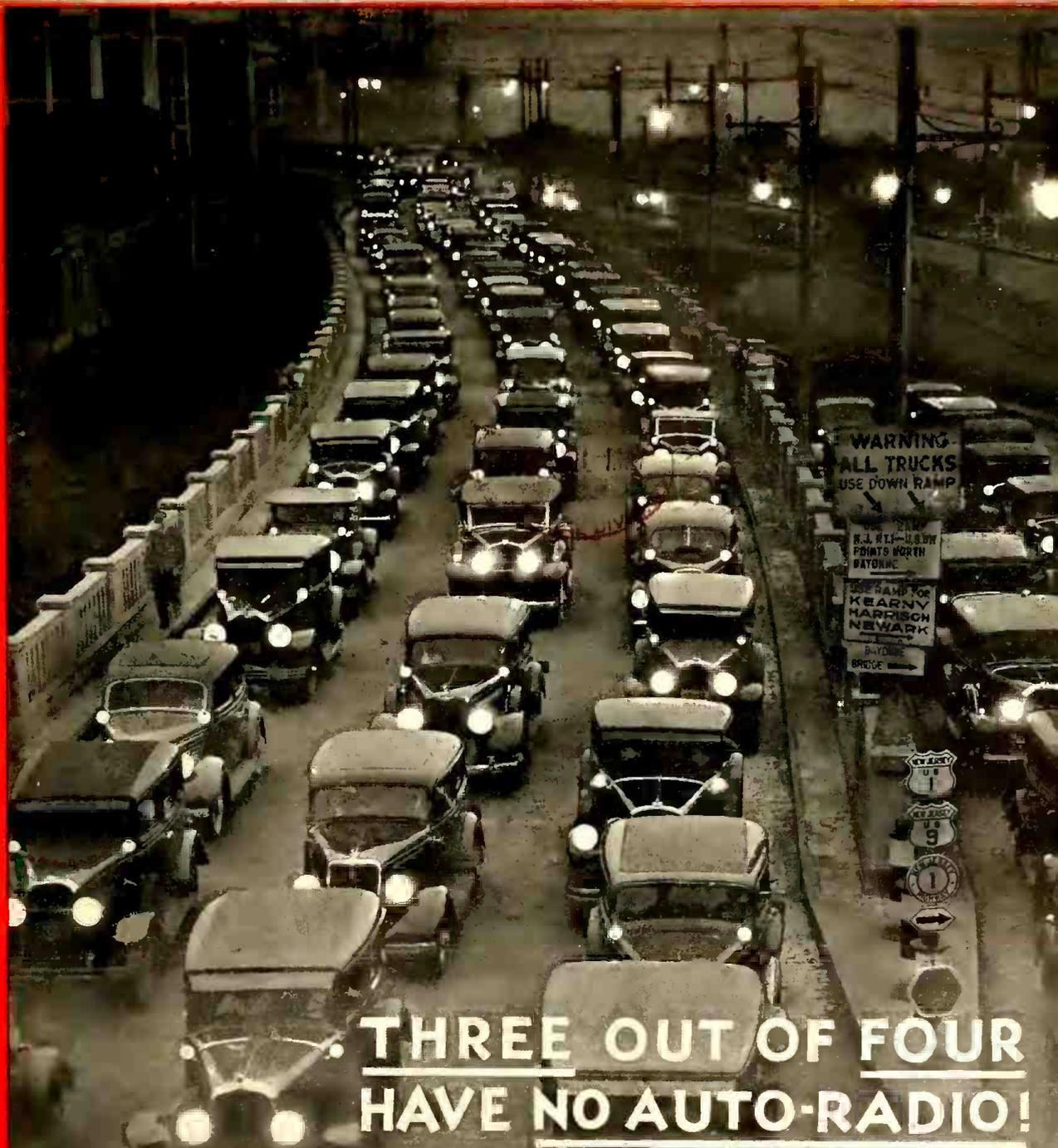
Selling Inter-
communication

Dealers' Sales
Calendar

Home Recording
de Luxe

Making Money
Out of Parts

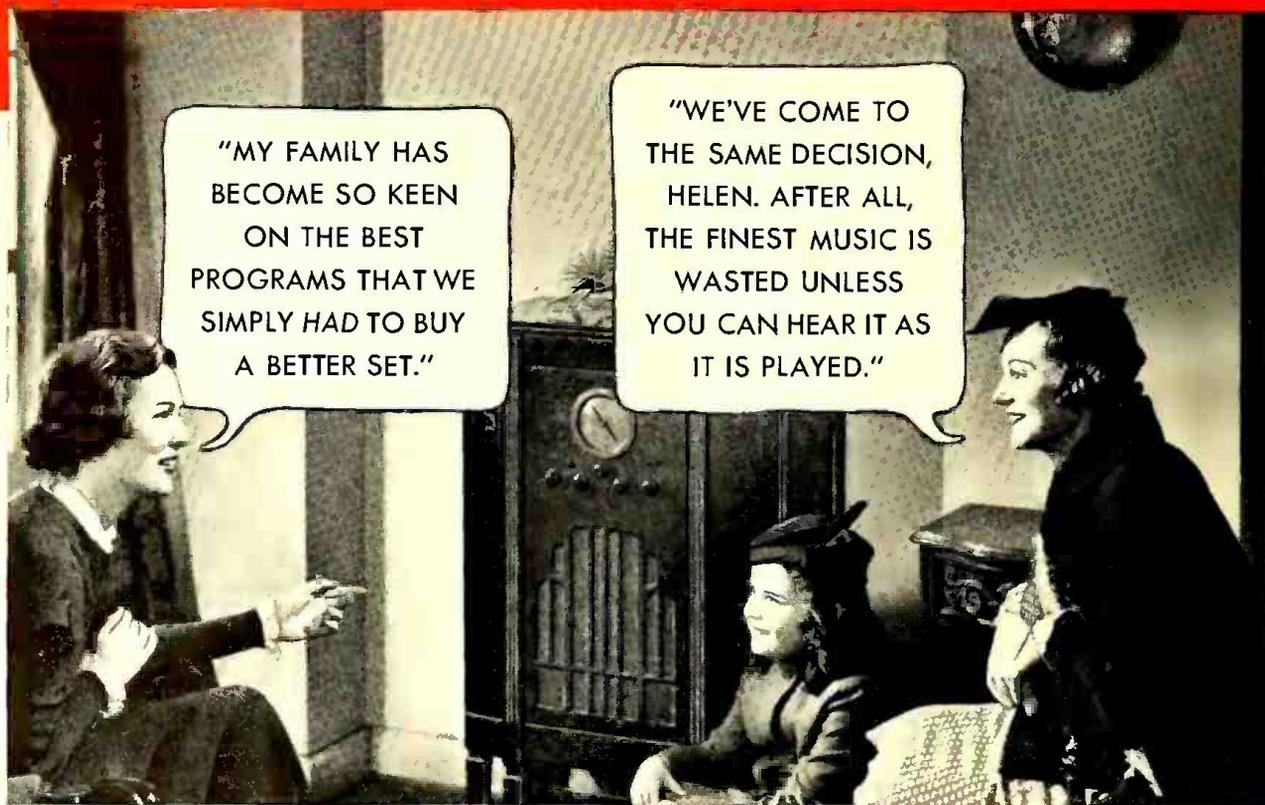
Tubes and
Servicing



**THREE OUT OF FOUR
HAVE NO AUTO-RADIO!**

FEBRUARY
• 1937 •

It's a proved fact— *that talking up the finer radio programs helps to sell the finer sets!*



National Broadcasting Company's fine programs are a great sales asset

In the stiff competition for the better type of radio set business today, dealers are always searching for a new hook-up with the consumer's interest. And wise dealers are finding an extremely profitable one in NBC's splendid and widely-popular programs.

In the course of every sales talk, there comes an interval when everything seems to have been covered. Tone, features, finish, price—that's all over. And with a sale hanging in the balance, *that's* the time to mention the really fine programs—programs with which the prospect is already familiar.

Programs which come over the famous NBC networks are consistently good—customers know this as well as the dealers themselves. Mention of them strikes, in countless cases, a subtle yet powerful sales keynote which aids materially in the final decision.

Tell your customers this: "The finest programs are no better than their reception—give them the best you can possibly afford!"

The broadcasting system and the interests of the 15,000 dealers who contact and sell four to five million listeners a year are closely bound together. Use National Broadcasting Company programs to demonstrate receivers, and swing your sales to a better type of instrument!

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

NATIONAL BROADCASTING COMPANY, INC.

A Radio Corporation of America Service

NEW YORK • WASHINGTON • CHICAGO • SAN FRANCISCO

This advertisement
will appear in an
April issue of
THE
SATURDAY EVENING POST

HOW CAN IT BE DONE?

ITS NO MYSTERY
 THE SECRET IS NOT THE PRICE BUT THE
 QUALITY OF THE CONSTRUCTION AND THE
 CAREFUL CHOICE OF THE PARTS AND THE
 THE WAY OF SUPPLYING THE MATERIALS

Simplex

INTERNATIONAL DISTRIBUTION THROUGHOUT THE WORLD

IT IS NO SECRET TO THE TRADE

• For years SIMPLEX has been one of the world's largest producers of private brand receivers. Though the entire SIMPLEX policy has been changed to a protected Distributor plan augmented by powerful national advertising, the SIMPLEX manufacturing policy remains the same: **THE MOST RADIO PER DOLLAR!**



• With the nationally advertised SIMPLEX line you are able to consistently undersell every other name brand on the market. That is the SIMPLEX pledge to its distributors and dealers.

Use the telephone, call Sandusky 1000 right now for details—and reverse the charges.

SIMPLEX RADIO COMPANY, SANDUSKY, OHIO

RADIO TODAY, February, 1937, Vol. III, No. 2, published monthly by Caldwell-Clements, Inc., 480 Lexington Ave., New York, N. Y. Subscription yearly \$1.00 in U. S. and Latin American countries; \$1.25 in Canada; \$2.00 all other countries; single copy, 15c. Entered as second-class matter July 24, 1936, at the post office at New York, N. Y., under the Act of March 3, 1879. Printed in U. S. A. Copyright 1937 by Caldwell-Clements, Inc.

Spotting the features

**THAT HELP YOU MOVE
RCA VICTOR RADIOS FASTER!**



**Number 1
RCA VICTOR'S
MAGIC VOICE**

The Magic Voice has proved to thousands that it has removed the last serious obstacle to complete naturalness of music and voice in radio. For the Magic Voice ends "boom", directs all sound forward through the loud speaker. Its completely closed chamber contains five organ-like pipes which eliminate all undesirable tone and which control back waves. This results in increase of low frequency range. The size and position of the pipes in the sound chamber were determined by mathematical calculation after hundreds of laboratory tests. The Magic Voice has given radio a completely new tonal quality. It extends musical range, gives brilliant expression to programs found by RCA Victor's Magic Brain, tuned by the Magic Eye, made more sensitive by RCA Metal Tubes. RCA Victor has spent huge sums of money promoting the Magic Voice. So remember its qualities, shown above. Talk about them—and profit!



RCA Victor Console Model 9K-3...with Magic Voice, Magic Brain, Magic Eye, Metal Tubes. 530 to 22,000 kcs. Beam Power Amplification. Selector Dial. 9 tubes. \$129.95 f.o.b. Camden.



**THESE 24 EXCLUSIVE RCA VICTOR FEATURES ALSO MEAN
FEWER "FIRST YEAR", NON-PROFIT SERVICINGS**

Magic Voice; Magic Brain; Magic Eye; Metal Tubes; Worldwide Reception; Super-Fidelity Speakers; Higher Fidelity Tone System; Duo-plane Speaker Mountings; Tone Compensation; Dynamic Expansion; Micro-tone Control; Music-Speech Control; Beam Power Amplifiers; Antenna Wave

Traps; Built-in Antenna Couplers; Automatic Volume Control; Permanent Adjustment; Stabilized Oscillator Circuit; Rubber Floated Chassis and Condensers; Selector Dial; Band Spreaders; Edge Lighted Dial; Record Player Connections; Magnificent Cabinets.

RCA VICTOR believes the best way to sell *more* radios *faster*...to reap richer profit rewards...is to offer *extra* quality at moderate cost.

For this reason, RCA Victor urges dealers to become familiar with its 24 great features for finer performance. *Proofs* of quality construction, they are convincing because they are actual *facts*. If you will acquaint yourself with these *extra* RCA Victor qualities...*show* these features to your prospects...*talk* features to them—you'll move your RCA Victor radios *faster, easier* and with more profitable results.

This is the first of a series of advertisements designed to bring you closer to RCA Victor's radio features. Each

will "spot" a definite feature—tell you its advantages, so you may do the same when selling direct to a customer. Study this information...keep it handy...*use* it...to *your* advantage.

RCA ALL THE WAY

Most broadcasting equipment is built by the Radio Corporation of America. Most power on the air is RCA installed. The newest RCA Victor sets keep the thread of RCA quality unbroken from the microphone to you. They bring you reception to match the fidelity with which RCA equipment and NBC engineering put programs on the air.



RCA Victor

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

A Service of the Radio Corporation of America

MISTER JOBBER AND DEALER HERE'S YOUR OPPORTUNITY!

LIST
\$49⁹⁵

F.O.B. Chicago
6-volt 175 watts
Push button starter
D. C. ONLY



the New **RED TOP** GAS-O-LECTRIC POWER PLANTS

Dealers! Jobbers! Send now for discounts and full details on the new RED TOP Gas-O-Lectric Power Plants. This is your own exclusive line . . . priced for quick sales and big profits.

Millions of farms, trailers, industrials and others clamor for this economical means of charging batteries and producing electricity to operate radios, lights, electrical equipment and appliances, etc. The RED TOP Line fills the bill. Here are some of its outstanding

features: *Combination A. C. and D. C. or D. C. only, fuel tank base, light weight, portable, low-cost operation.* Go RED TOP in 1937! Our complete merchandising plan, sales helps, literature, etc., will help you put it over. Mail the coupon immediately for full details.

COMBINATION A. C.-D. C. PLANTS

In one plant—both 110-volts A. C. 300 watts; and 6, 12, or 32-volts D. C. up to 350 watts, for battery charging Generator mounted on engine. Prices from \$89.95 up, F. O. B. Chicago. The coupon will bring complete detail

**PIONEER GEN-E-MOTOR CORPORATION
CHICAGO, ILL**

Go **RED TOP!**
IN 1937!
THE COMPLETE EXCLUSIVE DEALER-JOBBER LINE

PIONEER GEN-E-MOTOR CORPORATION

Dept. No. R-2B 466 West Superior Street, Chicago, Illinois.

Please send at once information and discounts on RED TOP Gas-O-Lectric Power Plants.

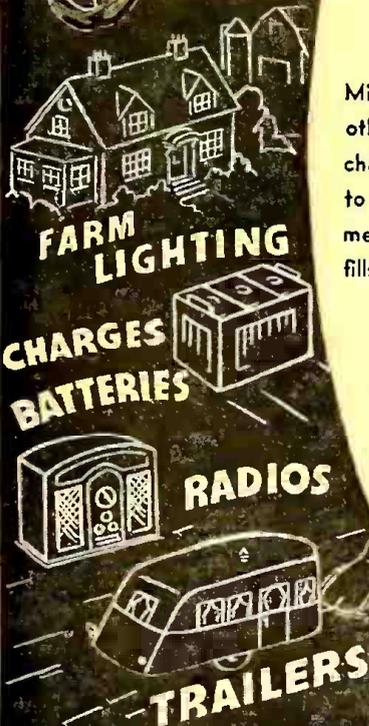
NAME _____

ADDRESS _____

CITY _____

STATE _____

TYPE OF BUSINESS _____



FARM LIGHTING

CHARGES BATTERIES

RADIOS

TRAILERS

*Mail
Coupon
Now!*

What 1937 Refrigerator will carry an authoritative "Seal of Approval" to assure purchasers of faster freezing, uniform shelf temperature, food odor prevention and greater ice-cube capacity?

What 1937 Refrigerator scientifically eliminates all food odors from its cabinet interior and prevents contamination due to odor absorption?

What 1937 Refrigerator will offer a doubled ice-cube capacity of 16 pounds of ice (168 cubes) even in lowest-priced models?

What 1937 Refrigerator has the new Econo-Phase Vacuum Freezing Unit to increase its efficiency, economy and overload capacity?

What 1937 Refrigerator will have handy shelves that can be lifted out for easy cleaning, and for use as trays?

What 1937 Refrigerator will establish new style in deluxe cabinet design with one piece cabinet and Duo-Seal doors?

(PLEASE TURN TO PAGE 49)

PARRIS-DUNN LAUNCHES SENSATIONAL *New* DUN-CHARGER COOPERATIVE MERCHANDISING PLAN

DEALERS—Build Your Battery Radio Sales With this Amazing New Merchandising Plan

When you tie in with the powerful new merchandising plan of the Skyscraper Dun-Charger, you are assuring yourself of all the opportunities offered by the greatest sales plan ever conceived. A plan that actually creates radio prospects and gives them a check for \$2.50 to apply on the purchase of a farm radio. It then automatically makes each purchaser a salesman for you and Parris-Dunn pays their wages.

REVOLUTIONARY IN DESIGN

The new DeLuxe Skyscraper Dun-Charger with its 10-foot installation in many cases puts the propeller above the eddy currents and broken wind stream increasing its efficiency as much as 30% over low mounted chargers. The exclusive Dunn governing device controls propeller speed perfectly even in violent windstorms and the positive elimination of broken blades as the propellers tilt back and slip the wind. All governing devices are kept off the blades so that the propeller is light and free to operate in the lightest winds.

HOW THE NEW MERCHANDISING PLAN WORKS

Dealers may order any quantity of Dun-Chargers without special order blanks at \$15.00 net cash F.O.B. the factory.

Radio Manufacturers cooperating with us will coupon their radios. The dealer, if he so desires, can use the coupon as a premium to give the buy-

*The Higher
the Tower
The Greater
the Power*

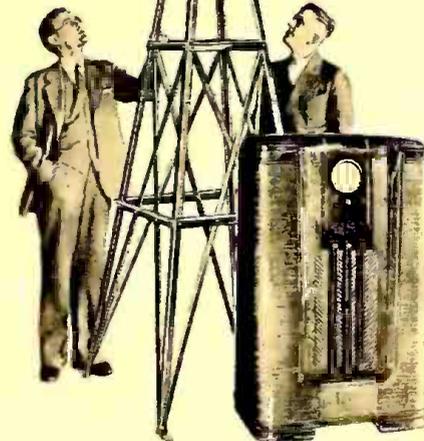
**DELUXE
SKYSCRAPER
DUN-CHARGER**

Special to Dealers

\$15.00
F.O.B.

CLARINDA,
IOWA

**PHILCO
APPROVES THE
SKYSCRAPER
DUN-CHARGER**



FEATURING UNMATCHED QUALITY IN

1. Propeller — Dunn's stronger and more efficient.
2. Speed Control — Dunn's positive automatic — patented and exclusive.
3. Generator — Extra Heavy Duty Wind-Electric, with oil sealed bearings.
4. Collector ring — lifetime, foolproof.
5. Turntable — ball bearing.
6. Propeller Shut-off-pull back type making brakes unnecessary and obsolete.
7. Tower — Heavy reinforced steel, double height.
8. Instrument Panel — new, completely wired.

er of his radio the opportunity to purchase a Dun-Charger direct from our factory for \$15.00.

If charger is delivered by the dealer with a 6-volt radio, we suggest a delivery price from \$17.50 to \$19.50. An installation charge of \$5.00 to \$15.00 should be made.

DUN-CHARGER PAYS FARMERS FROM \$1.00 TO \$25.00 FOR BUYING YOUR RADIO

Packed with each Dun-Charger are 25 special order blanks which the purchaser hands to friends and neighbors, these blanks entitling the holders to buy a Dun-Charger at \$17.50 F.O.B. factory. For his work, Parris-Dunn will mail him a check of \$1.00 for every order received bearing his name.

DUN-CHARGER PAYS EVERY FARMER \$2.50 TO APPLY ON PURCHASE OF RADIO, AT YOUR STORE

Every one who buys a Dun-Charger direct from our factory at \$17.50 will be given a check for \$2.50 to be applied on the purchase of a new 6-volt radio. This check will be redeemed in cash by Parris-Dunn Corporation when accepted and certified by any store selling a radio manufactured by a company couponing and recommending the Dun-Charger. A list of these manufacturers will be supplied to all holders of the \$2.50 checks.

PARRIS-DUNN MERCHANDISING PLAN BACKED BY NATIONAL AND STATE FARM PAPER ADVERTISING CAMPAIGN

Every month Nine Million ads are appearing in National and State farm papers telling the farmer how he can receive a Dun-Charger FREE. Dealer helps — folders, letters, new leads to prospects in your community and local newspaper ads featuring your radio and Dun-Charger — are supplied all dealers selling one of the radios whose manufacturers are cooperating with us on this plan.

Here is an amazing opportunity to skyrocket your 6-volt farm radio sales with the greatest cooperative merchandising plan ever devised. Get your display model today and take advantage of the peak of the farm radio selling season.

Mail Coupon Today for Details!

**IT'S A LEADER
A CLOSER
COOPERATIVE
MONEY-MAKER
COLOSSAL**

Parris-Dunn Corporation,
Clarinda, Iowa.

I think this is a real merchandising plan and I would like to see the radio we are now handling packed at factory with Dun-Charger coupon.

Make of radio handled.....

Name..... City.....

County..... State.....

Please send further details on the PARRIS-DUNN Cooperative Merchandising plan.

I am enclosing..... for which please send me.....
Skyscraper Dun-Charger including high tower, according to your special money back guarantee test offer.

Prices and Merchandising Plan good only in U.S.A.

No one who can afford a new radio can miss this news:

\$10 *down puts*
PHILCO
AUTOMATIC TUNING
in your home!

The whole power of Philco magazine advertising is being concentrated on putting that message across! There won't be a man or woman in your town who has a ten dollar bill—or a couple of fives—who won't see it and become a red-hot Philco prospect.

They have all been reading about Philco Automatic Tuning . . . hearing about it from Boake Carter on the air and from friends who are already enjoying its convenience.

Now . . . in straight from the shoulder advertising with no punches pulled . . . Philco is telling them that \$10 down at your store puts Philco Automatic Tuning in their homes!

Will anyone who reads that news . . . *and no one can possibly miss it* . . . give the slightest consideration to a radio that hasn't radio's greatest convenience . . . Philco Automatic Tuning? There's only one answer to that question . . . and you know the answer!

PHILCO RADIO & TELEVISION CORPORATION

Staff—

DARRELL BARTEE
RANDALL R. IRWIN
M. H. NEWTON
B. V. SPINETTA
VINTON K. ULRICH

LEE ROBINSON
Sales Manager

RADIO TODAY

ORESTES H. CALDWELL
Editor

M. CLEMENTS
Publisher

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Tel. PLaza 3-1340

Vol. III, No. 2

STRIKES, FLOODS, SLOW UP RADIO SALES

★ Movement of radio for the first six weeks of the new year, fell off somewhat, dropping behind the corresponding pace of 12 months ago. Chief causes were local and sectional, resulting from nation's recent major economic upsets of strikes and floods.

Pacific Coast sales went badly off for two months pending settlement of the shipping strike. Ohio River floods put large distributing centers out of commission, but replacement stocks are now moving briskly. The General Motors strike laid a pall on radio in many Middle West industrial centers.

With these emergencies out of the way, the background radio picture continues bright.

DUTY WELL DISCHARGED

★ During the time that the Ohio river just kept rollin', radio dived into the emergency with the greatest heroism ever. Described by President Roosevelt as "unselfish and praiseworthy," radio's rescue feat was also the subject of a long salute from Anning S. Prall, FCC chairman. Latter bouquet was for consistent "reporting conditions, warning residents of impending danger, collecting funds and serving as a clearing house for relief effort."

With mobile units, radio offered priceless aid in directing rescue boats, doctors, police, guiding fleets and trucks with provisions, cars with medicine and serum. RCA instantly offered its entire available stock of short wave battery sets; auto radios were also used in boats with 6-volt batteries to receive relief instructions from broadcast stations.

Interesting indeed was the fact that in areas where homes were permitted to use only two electric sockets, one of these was designated for a light, the other for radio. Broad-

casters ditched their regular schedules, worked overtime gratis, mouth-pieced for police and firemen, staged benefit shows. Amateurs were intelligently active.

Radio plants in the path of the fury were Crosley in Cincinnati and Ken-Rad in Owensboro, Ky. Crosley lost a small assembly building in a fire but main plants remained intact, will be back to normal when first floors are dry and repaired. Work at Ken-Rad was interrupted temporarily only by loss of railroad service.

NEW PRICE-LEVEL ENCOURAGES TUBE PEOPLE

★ Radio-tube makers and sellers bubble with optimism at recent tube-price increases. They feel that the way is now open for profitable tube business all along the line. Dealers and servicemen are expected to give more attention to tubes as a profit item.

While recent increases averaged only 11 per cent, it should be noted that on the eleven or so tube types which make up 85 per cent of the

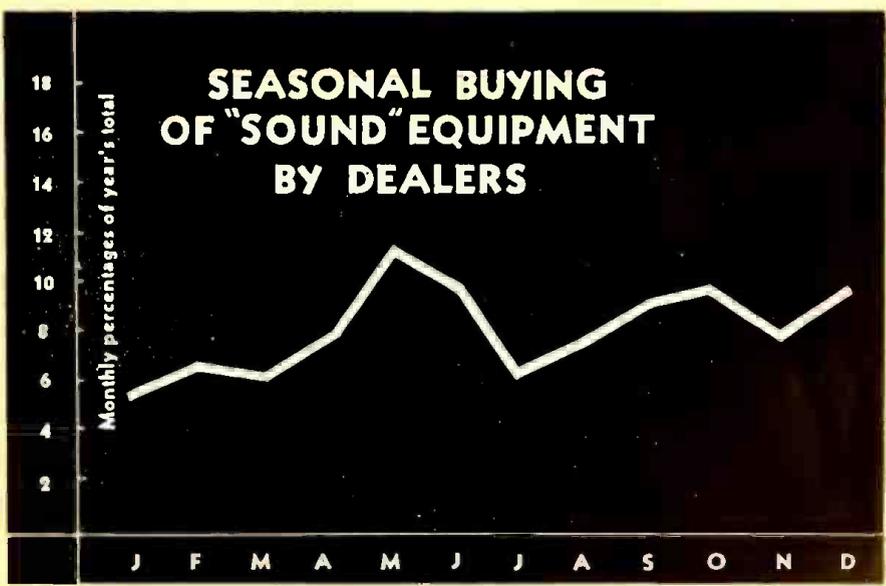
business, the price increase has averaged 20 per cent.

Meanwhile to encourage and protect tube sales by radio servicemen, RCA is experimenting in the Baltimore and Washington territories with a special brand for servicemen, which will be distributed only through service outlets. The "Cunningham" trademark, dropped two years ago as a separate brand, has been revived for this serviceman experiment which, if successful, may be extended to a national scale.

PARADE TO CHICAGO

★ Robust reports from the officials of the newly formed Radio Parts Manufacturers National Trade Show, Inc., indicate certainly that affair at the Stevens Hotel, Chicago, June 10 to 13, will be nearly twice as important as previous events.

S. N. Shure, big chief of the show corporation, speaks of contracts for 100 booths secured in less than one month. Appears that the Exhibition Hall will bulge in places, from the wild cooperation currently received by the sponsors.





H. C. Bonfig, who now heads up sales activities for RCA-Victor at Camden.

ROBIN'S EGG?

★ Be sure that a good section of the 61,000,000 females in this country tuned in early this month on a big fashion broadcast direct from Paris. Here was the dramatic reason why every woman needs a personal receiver constantly at her disposal, if she means to have a man. This broadcast revealed advance data on Spring style trends within a few hours after the Paris openings came to a close, and before pictures could appear in newspapers.

Gals knew right off whether blues would be robin's egg, ultramarine, and whatall. Sara Pennoyer, fashion director for New York's Bonwit Teller, covered the style shows, rushed to a mike and blabbed the whole thing to U.S. women via CBS.



Harry Alter (right), just appointed director of sales of General Household Utilities, by William C. Grunow, president. With Harry, at left, are Art Alter and Max Geisler, who continue in the Chicago Grunow distributorship.

INTERFERENCE CAUSES SET RETURNS

★ The largest factor in the return of radio receivers purchased and then returned as "unsatisfactory in operation," is caused by electrical interference and "manmade static," according to analyses made by New York department stores.

Purchasers do not realize that electrical interference picked up by inadequate antennas, may result in intolerable listening conditions, and so blame the trouble on the radio receiver itself. So back the radio goes to the store!

As the use of electrical appliances increases, the interference grows worse.

Education and proper antenna in-

stallations seem to offer about the only solutions to this return-set problem.

COLORS AND THE BUYING URGE

★ With color now playing a prominent part in smaller radio cabinets, manufacturers are trying to find clues to favorite tints.

Already in the automobile field, it is well known that tan has the call in the West, black in the East. In toothbrushes, red is most popular in the 10-cent line, but has little appeal in the 25-cent class, where amber leads. For boudoir sets, coral and lilac sold out weeks before last Christmas. Fountain pens of a certain green are best sellers.

Athletic persons apparently favor red colors in general; intellectuals prefer blue; egotists like yellow; "good fellows" prefer orange. Children and the young want bright tints; older people like dark grays, browns and black.

HOW THEY PAY THEIR BILLS

★ The Bureau of Business Research of the Detroit Institute of Technology has made a survey of 120 retail establishments, to determine the percentages of credit risks of various occupations. As reported by *Credit World*, here are the percentage figures:

Railroad employees	90.8
Office clerks	88.2
Nurses	87.5
Accountants	85.8
Teachers	85.2
Municipal firemen	84.1
Street railway employees.....	84.0
Mail carriers	81.0
Municipal policemen	80.5
Skilled male factory help.....	79.6
Retail grocers	79.1
Retail butchers	78.9
Retail bakers	76.1
Plumbers	75.2
Clergymen	74.6
Retail store salesmen.....	71.5
Doctors	69.8
Dentists	69.5
Unskilled fema'e factory help....	68.8
Farmers	68.7
Gas station attendants.....	67.8
Unskilled male factory help.....	65.8
Bricklayers and masons.....	65.4
Drug store employees.....	65.1
Auto mechanics	64.0
Carpenters	60.2
Domestic servants	55.2
Hotel help	54.1
Lawyers	53.9
Barbers	53.6
Miscellaneous workers	53.4
College students	42.4
Painters and decorators.....	40.7
Restaurant help	34.8
Artists	32.2
Entertainers	29.3
Cab drivers	28.8



W. Paul Jones, Fairbanks-Morse gm, chief speaker at record meeting of 2,500 F-M dealers at New York last month.

SETS AVERAGE \$55, MIDGETS \$11, WASH., D. C.

★ Each month radio distributors in the Washington, D.C., territory report to the cooperative Electric Institute, 10 and E Street, NW, there, their sales for the previous month, thus giving a very accurate record of radio sales in the Washington region.

During 1936, reports William G. Hills, assistant managing director of the Institute, 36,698 console radio sets were sold at an average retail price of \$55, and 9,000 midgets at \$11 average. These 1936 figures revealed a 1.2 per cent decrease in the larger sets, and an increase of 30 per cent in midget sales, compared with the preceding year.

4-BOSOMED LISTENERS

★ Something has happened to that nameless look which the contented cow wears in her eyes. The calm of the cow-barn has been canceled; radio sets are a part of milking equipment and the cows have developed formal attitudes on broadcast fare.

At Lancaster, Pa., the thirty cows belonging to dairymau Park Miller have been radio fans for almost a year. "Give!" means Mr. Miller when he turns the set on, and if there's a hot dance band to be heard, the cows give. But in their quiet, chewy way they resent symphonies, waltzes, speeches and comedy. They regard all forms of drama as a pure bore, and if there's too much of it, seem half inclined to withhold their product.

ASIDE TO GEORGE VI

★ England's new king must face the fact that all is not well in Canada, better known here as the Dionne area. Canadians are supposed to buy radio licenses when they buy radios, but they wink at the license bureaus just as we used to wink at the prohibition officers. There are believed to be 1,471,800 families with radios and only 829,229 radio licenses!

Other less picturesque dope on the Canadiaus: there are 2,408,600 total families in the Dominion, and radio saturation is now 61.1 per cent as compared with 33.9 per cent in 1931. Distribution is as follows:

Province	Population	Total Families	Radio Families
Prince Edward Isle	91,800	19,300	6,100
Nova Scotia	534,600	112,300	50,900
New Brunswick	425,600	89,400	31,300
Quebec	3,069,000	586,500	280,600
Ontario	3,616,000	835,300	651,400
Manitoba	741,000	161,100	110,800
Saskatchewan	979,500	226,200	114,900
Alberta	777,500	179,600	92,100
British Columbia	736,000	198,900	133,700

RADIO DIALS IN BRAILLE, FOR BLIND

★ A number of Philco automatic tuning models have been sold recently with station call-letters printed in the raised Braille system for the blind.

Inserted in the station "windows" in the tuning dial, the Braille call letters are "read" as easily by the blind as the customary printed letters are read by those who can see.



R. L. Triplett, who has just completed 35 years in the manufacture of electrical instruments.

Although Braille raised printing is not regular equipment, many public libraries have Braille printing apparatus and those institutions willingly permit their use in printing the station tabs required for such radio sets.

"Without automatic tuning and the Braille letters, the blind are forced to explore the range of the dial system every time a station is tuned and are compelled to wait for station announcement or for some familiar feature to be certain that the proper station is tuned in," explains Robert Herr, Philco parts manager.



At center sits C. M. ("Woody") Wilson, new sales manager of General Electric Radio. At left is Bill Saunders, who succeeds Wilson, and at right is Al Singer, GE district manager, appliance sales.

THIS AUTOMOBILE - RADIO

Radio man has increasing opportunity for sales and installation

★ THAT auto radio will be easier to sell in 1937 is apparent after a survey of the new models. The many new and revolutionary features found in the new auto sets are a tribute to radio's engineering staffs. Today we have car receivers with acoustical compensation or tone chambers in the loudspeaker for better tone. At least one manufacturer is using automatic frequency control for simple and easy tuning; another has a push-button system of tuning.

IN RADIO TODAY last month on pages 19 and 20, features of the Arvin, Emerson, General-Electric, RCA-Victor, and Zenith sets were described and typical models illustrated.

In the following paragraphs, we review those sets not covered previously. Complete specifications of all auto-radio sets appear on page 23.

Motorola this season again features its "magic eliminode" filter system of noise reduction. Brand new is the "acoustinator," a personal preference selector providing control of both sensitivity and tone—it provides distinct and noise-free reception. Other features of the line are: ortho-acoustic speaker housings with adjustable tone chamber, jiffy mounting bracket, "adapto" broad-range antenna system, permanent-magnet speakers, class B 13 watt output in the Golden Voice model.



Just push the button and there's your station with Admiral's Touch-o-matic tuning system of selecting 5 stations.

Noise-free reception is assured in Philco's sets which have filter systems to eliminate "chassis" spark interference and reduce antenna "spark" interference. Two "tee" bolts provide for rapid installation and easy removal for servicing. Tone control is placed on the instrument panel.

Trav-Ler's model 601 using octal type tubes and beam power stage has an output of $4\frac{1}{4}$ watts. Higher-fideli-

ty is provided by a dynamic speaker having a curvilinear cone. Humidity-proof resistors, condensers, transformer insure trouble-free operation. As with other manufacturers, custom dash controls are available. Tone control is on dash plate.

American-Bosch's line has 7 models—ranging from 5 to 8 tubes. Larger models have "double-winged" chassis separating the power supply and radio elements of set and Centr-o-matic design giving shorter wiring leads and less soldered connections, while noise traps effectively reduce all interference.

Robot-controlled synchro-tuning is the key of Delco's popular appeal. It provides a low internal noise level and automatically synchronizes the radio with the antenna. Metal and octal-glass tubes are used—the new beam power output type is utilized for greater power. Motor noise eliminator does away with the need of suppressors. Custom controls are made for all cars—and an instrument panel type speaker is available for the 1937 Buicks and Oldsmobiles.

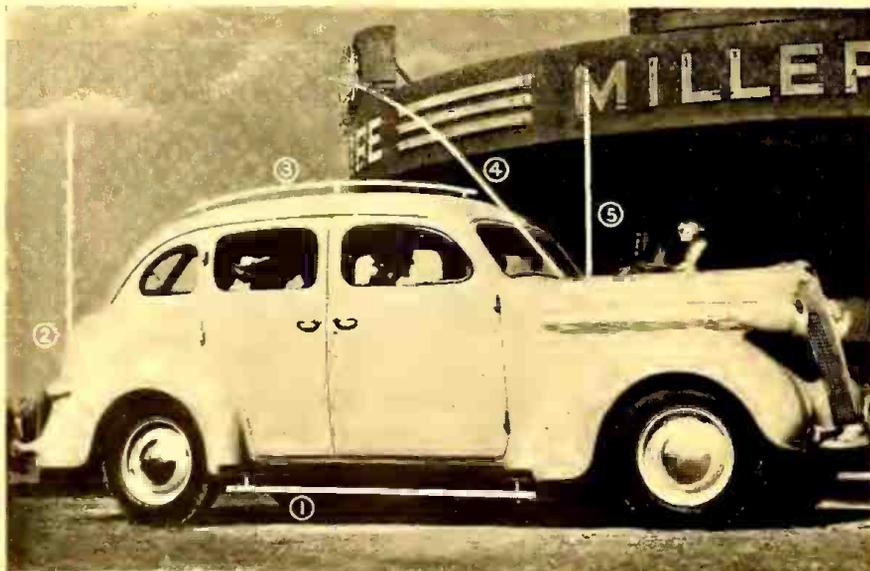
Push-button tuning

Touch-O-Matic tuning is but one of Admiral's contributions to 1937 auto radio. Tuning the various stations is as quick and simple as switching an electric light—the control fits on the steering column and is illustrated on this page. The four Admiral models can be adapted to operate with touch-o-matic. Other features are: low noise to signal ratio provided by efficient filtering and antenna matching, variable tone control, permo-dynamic speaker, single hole mounting.

The Grunow models have the octal-glass type tubes interchangeable with metal. An exclusive Hi-Lo compensation assures a full-rounded, natural tone. Custom controls are provided for all cars.

Economy plus performance is featured in the DeWald Motortone which is mounted just below and behind the instrument panel. Direct controls give a substantial savings without impairing efficiency. Set can be installed in practically every make of car with but little effort.

Karadio is the exceedingly descriptive name used by the Minneapolis



Auto owner now has a large choice of antenna types for his car. Dealer is in a position to select and quickly install any one meeting with approval.

BUSINESS BELONGS TO YOU

New developments in sets and controls

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Special Ford and General Motors models are in Fada's line for 1937. A power output of 3 watts is available and a tone control adapts quality to suit owner. Internal and external speakers insure maximum flexibility.

Generally speaking this year's auto radios have a low noise level and re-

quire no spark plug suppressors. Antenna matching systems are used which will permit the utilization of practically any type of aerial.

And new improved types of antennas give a better signal pick-up and reduce motor noise. This year some half-dozen or more antenna types are being used—insulated running boards on factory installations, internal roof wires on fabric-top cars. Several of the external types are illustrated on the preceding page; they include the fish-pole, the topper, the streamline roof, and the under-car. All are designed for rapid installation.

On a following page are tabulated the specifications of close to one hundred auto radio models. A comparison with last year's models shows higher power output and lower battery drain. The cold-cathode gaseous rectifier tube has increased the efficiency of power supplies and the beam power output tube gives greater power to the sets.

A study of the specifications shows that custom controls are available with most models, that single and 2-hole mountings are almost universally employed. Permanent magnet speakers have been utilized in the more expensive models.

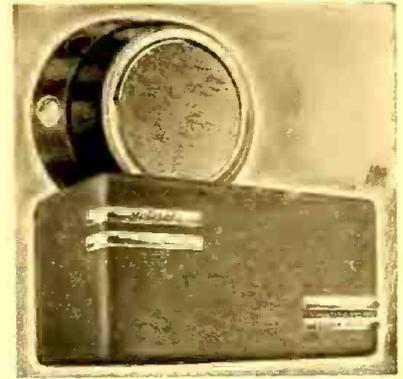
A recent letter from an exec of a large auto radio company states that the percentage of auto radios installed by factories as initial equipment is relatively low, the majority being done by radio (and automobile) dealers. This certainly indicates that the radio dealer is the leading factor in the auto radio business.

To the radio dealer and serviceman—"This auto radio business is yours."

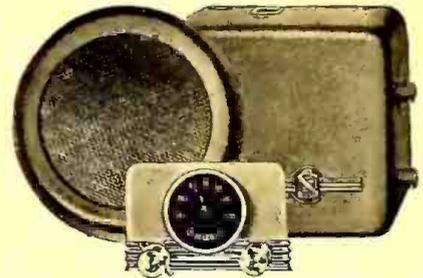
4,565,000 AUTOS

★ Figures reported by the Automobile Manufacturers Association show that 4,565,000 cars and trucks were produced last year, an increase of 11 per cent over the preceding year, but not equalling the banner outputs of 1928 and 1929. With accessories, tires, etc., the total automotive business is given a wholesale value of over three-and-one-half billion dollars.

The automobile industry bought 72 per cent of all plate glass produced, 35 per cent of all lead, 17 per cent of all copper, and 22 per cent of all steel.



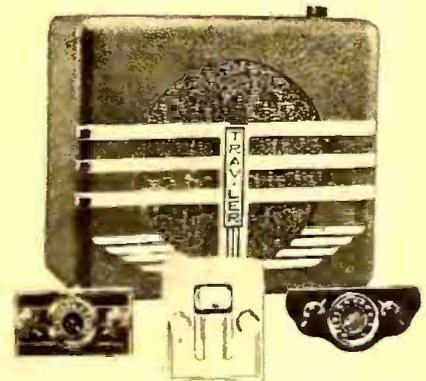
Golden Voice model by Motorola, pioneer auto-radio company, features 13 watts output.



Beam power-output tubes give this deluxe Delco a tremendous volume.



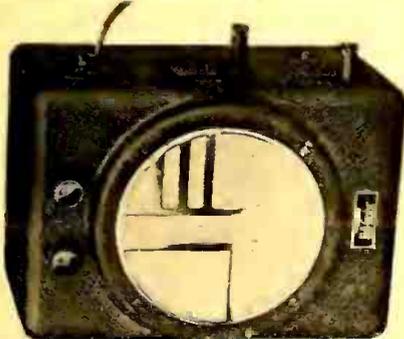
De-Wald's Motortone fits neatly below and under the instrument panel.



High-power output, classy looks are but two of Trav-Ler's features.



Belmont's Model 667, using 6 metal and octal glass type tubes.



Local-distance and tone control are used in the new Wells-Gardner set.



Six models comprise Philco Transitone's 1937 line of auto radios.

THIS AUTOMOBILE - RADIO BUSINESS BELONGS TO YOU

Radio man has increasing opportunity for sales and installation

* THAT auto radio will be easier to sell in 1937 is apparent after a survey of the new models. The many new and revolutionary features found in the new auto sets are a tribute to radio's engineering staff. Today we have car receivers with acoustical compensation or tone changers in the loudspeaker for better tone. At least one manufacturer is using automatic frequency control for simple and easy system of tuning.

In Radio Today last month on pages 19 and 20, features of the Arvin, Emerson, General Electric, RCA, Victor and Zenith sets were described and typical models illustrated.

In the following paragraphs, we review those sets not covered previously. Complete specifications of all auto-radio sets appear on page 22.

Motorola this season again features its "magic eliminic" filter system of noise reduction. Brand new is the "acoustinator," a personal preference selector providing control of both sensitivity and tone—it provides distinct and noise-free reception. Other features of the line are: ortho-acoustic speaker housings with adjustable tone changer, jiffy mounting bracket, "adaptive" least-range antenna system, permanent-magnet speakers, class B 13 watt output in the Golden Voice model.



Just push the button and there's your station with Admiral's Touch-o-matic tuning system of selecting 5 stations.

Noise-free reception is assured in Philco's sets which have filter systems to eliminate "class A" spark interference and reduce antenna "spark" interference. Two "tee" bolts provide for rapid installation and easy removal for servicing. Tone control is placed on the instrument panel. Trav-Ler's model 601 uses octal type tubes and beam power stage has an output of 4½ watts. Higher-fidelity is provided by a dynamic speaker having a corrugated cone, Humidity-proof resistors, condensers, transformer insure trouble-free operation. As with other manufacturers, custom dash controls are available. Tone control is on dual plate.

American-Bosch's line has 7 models—ranging from 5 to 8 tubes. Larger models have "double-winged" chassis separating the power supply and radio elements of set and Gen-Pro-matic design giving shorter wiring leads and less soldered connections, while noise traps effectively reduce all interference.

Robot-controlled synchro-tuning is the key of DeLco's popular appeal. It provides a low internal noise level and automatically synchronizes the radio with the antenna. Metal and octal-glass tubes are used—the new beam power output type is utilized for greater power. Motor noise eliminator does away with the need of suppressors. Custom controls are made for all cars—and an instrument panel type speaker is available for the 1937 Buicks and Oldsmobiles.

Push-button tuning

Touch-O-Matic tuning is but one of Admiral's contributions to 1937 auto radio. Tuning the various stations is as quick and simple as switching an electric light—the control fits through the steering column and is illuminated on this page. The four Admiral models can be adapted to operate with touch-o-matic. Other features are: low noise to signal ratio provided by efficient filtering and antenna matching; variable tone control, permanent-dynamic speaker, single hole mounting.

The Grano models have the octal-glass type tubes interchangeable with metal. An exclusive Hi-Lo compensation assures a full-rounded, natural tone. Custom controls are provided for all cars.

Economy plus performance is featured in the DeWald Motortone which is mounted just below and behind the instrument panel. Direct controls give a substantial savings without impairing efficiency. Set can be installed in practically every make of car with but little effort.

Karadio is the exceedingly descriptive name used by the Minneapolis

New developments in sets and controls

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4,585,000 AUTOS

* Figures reported by the Automobile Manufacturers Association show that 4,585,000 cars and trucks were produced last year, an increase of 11 per cent over the preceding year, but not equalling the banner outputs of 1928 and 1929. With accessories, tires, etc., the total automobile business is given a wholesale value of over three-and-one-half billion dollars.

The automobile industry bought 72 per cent of all plate glass produced, 35 per cent of all lead, 17 per cent of all copper, and 22 per cent of all steel.



Auto owner now has a large choice of antenna types for his car. Dealer is in a position to select and quickly install any one meeting with approval.



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Local-distance and tone control are used in the new Wells-Gardner set.



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HOW TO SAVE ON INCOME TAX

Suggestions for radio men, when making out returns due March 15.

Deductions for expenses, capital losses, taxes, depreciation*

* BEFORE March 15th, the radio man, like everybody else in business, must make out and file his Federal income-tax report.

By careful attention to well accepted principles in making out such tax report, the radio man can usually effect considerable tax savings. Such savings are entirely proper, since the principle is now well established that a tax-payer may so arrange his business or execute his transactions as to result in the lowest possible tax. The mere purpose of avoiding taxation is regarded as entirely proper and is recognized by the courts as the normal course for a tax-payer to follow.

Charge off

For example, against net profits earned, the radio man may charge off as deductions certain expenses and allowances, as listed in the accompanying chart:

On his automobile, whether used for business or pleasure, the radio man may deduct allowances for amounts paid during the year for Federal and State gasoline taxes, for license fees, for interest on money borrowed in purchasing the car, and for loss and damages (not compensated by insurance) due to casualty, fire or theft.

On an automobile used wholly for business, the dealer can deduct allowances for:

Chauffeur's salary Insurance
Depreciation Gas and Oil
Garage rent Repairs
Loss on sale of car.

If a car is used only partly for business, then the deductions are allowable only in the ratio that the automobile is so used.

On the average car, he may charge off "depreciation" at 25 per cent per year; on trucks costing under \$1,000, 33 1/3 per cent; on trucks \$1,000 to \$1,500, 25 per cent. Costlier trucks take lower rates of depreciation.

Not deductible are accident damages from operation of pleasure car, cost of new car, expense of defending damage suit, expense of travel between home and business, fines for traffic-law violations, or losses on automobile trade-ins.

Equipment depreciation

On office and store equipment the following depreciation rates are allowable:

Adding machines	10%
Addressographs	10
Awnings	20
Billing machines	12 1/2
Book cases	5
Cabinets, office	6 2/3
Desks	6 2/3
Dictaphones, Dictagraphs	16 2/3
Display cases	5
Fans, electric	10
Typewriters	16 2/3

Servicing instruments and equipment having a high rate of technical obsolescence would seem to deserve a depreciation rate of 25 per cent to 33 per cent, along with other radio apparatus. Tube testers and other service apparatus may be charged off completely as current operating expenses.

Tax payments, capital losses

Federal income taxes are not deductible from Federal or state income tax returns; however, state income taxes are deductible from Federal income tax returns.

The employer's share of "old-age benefit" and unemployment insurance taxes are deductible. The employee's share of the old-age benefit tax is not deductible from the employee's personal income-tax return.

The following taxes are deductible: tax on dues, stamp taxes, automobile license fees, gasoline taxes, import taxes, personal property taxes, real estate taxes, taxes on telegrams, telephone and radio messages, etc.

When the radio merchant or serviceman has sustained capital losses not compensated by insurance or other return, he may deduct the following:

- Automobile damage from icy pavement or freezing motor
- Automobile sale at a loss (business car)
- Experiments, unsuccessful
- Fire
- Patent infringement, judgment paid
- Sale of business property
- Storm
- Theft
- Transactions entered into for profit, outside of regular business
- Worthless securities.

Inventories and reserves

Under the recent enactments designed to prevent taking advantage of excessive losses, only \$2,000 allowance on capital losses is permitted in any year. In order to avoid this limita-

(Continued on page 42)

*This article has been prepared by RADIO TODAY based on information supplied by its tax expert, C. A. Petersen, 55 W. 42nd St., New York City.

YOU MAY DEDUCT THESE EXPENSES— When making out your income-tax return

Accounting fees
Advertising
Automobile upkeep, used in business
Bad debts
Business expenses
Chamber of Commerce dues
Contributions
Conventions, business, expenses of attending
Delivery service
Depreciation, business property
Depreciation, on furniture and fixtures
Dues, professional societies
Efficiency engineers, to reduce business costs
Employee's bond premiums
Employees, fees for obtaining
Entertaining customers
Income-tax returns, business, cost of preparing
Injuries to employees, not insured
Interest
Labor union dues
License fees
Light

Losses
Moving to new premises
Night watch service
Painting
Picnics, dances, entertainment for employees
Porter and janitor service
Postage
Professional journals
Refuse removal
Rent, business property
Repairs to business property
Salaries, business, (excluding own salary if individual proprietorship)
Sample room, hotel
Selling commissions
Stationery—letterheads, bills, envelopes, etc.
Supplies—wrapping paper, twine, signs, tags
Taxes
Telephone
Theft losses, not insured
Traveling expenses, business trips

WEEK OF SALES



MONDAY the clearly classic voice of Margaret Speaks on NBC's Red Network is a part of the dealer's radio merchandise.



THURSDAY radio salesmen have a date with Jeanette Nolan via the commanding CBS feature, The March of Time.



TUESDAY the snappy star Martha Raye adds plenty to sales interest as a hot section of Al Jolson's broadcast on CBS.



FRIDAY means that Lucille Manners, soprano plus on NBC's Red Net, is actually mixed up in modern radio shopping.



WEDNESDAY the choice singing of Gladys Swarthout on NBC's Red Net is a real reason for extra servicing and sales.



SATURDAY the radio store is conscious of the attractive vocal work of Benay Venuta, starring on Mutual's web.

GETTING THE RIGHT STORE LOCATION

Shopping traffic—business center—neighborhood selling.

Problems of store appearance and store-front modernization.

★ **NOTHING** is more important than the correct location of the store, if the merchant is to depend upon shopping traffic to keep his business in the public eye and to bring in customers. Especially is this true as radio becomes more and more a staple article of merchandise. The radio dealer must put his store where the largest number of potential customers will see it—and come in!

Selecting the right site for a radio store involves the balance of a number of factors. Street traffic is desirable, but it must be *shopping* traffic—*buying* traffic! Merely locating the store on an automobile artery, with cars whizzing by outside at 30 miles an hour, may mean little for store business, unless a striking store-front is arranged, which attracts attention and fixes this location in the motoring public's mind as "the place to buy radios." Parking facilities become a problem in connection with such a store—but so they do with any store today.

Traffic congestion is the reason that many radio dealers prefer to locate on the *edge* of the central shopping district, rather than right in the

center of the high-rent territory. Not only is overhead less, with reduced ground-rents, but opportunities for parking are better. Also there is a psychological advantage in being "out of the high-rent district," in the minds of thrifty buyers. Certain classes of customers, like farmers, will walk blocks to save a few cents. Other groups want to buy handily without going out of their way. With radio having drifted into a price-comparison situation, and with customers looking for price advantages on sets already selected in their own minds, bargain-hunting customers can be depended on to seek out the store.

Women buyers

It is an old maxim among department-store owners that no *single* department store can succeed in an isolated position. But if two other stores also move into the neighborhood of the first store, making *three* stores for women to visit and compare goods and prices, then *all three* can do a successful business.

More and more women are visiting radio stores and making their own

selection of sets. Of course, radio receivers are still bought mostly by the male of the household—with or without the woman being present. Yet the unmistakable drift is to put the woman in the seat of "primary purchaser." Cabinet design, color novelties, all increase appeal to feminine tastes. As this tendency proceeds, radio dealers must consider feminine desires and whims. This applies even to store location, for the shady side of a shopping street is usually the side preferred by women, and that side may command a differential of 25 per cent higher rentals. Certain chain stores locate as near to department stores as possible in order to obtain trade from the women pouring into the department stores.

Some chains have made a practice of putting traffic checkers—men with counters—into city streets, to count pedestrians passing store sites under consideration. This method of counting traffic is significant only, of course, if the investigator takes into consideration the character and personalities of the people passing. Some ingenious photographic methods have also been developed for this purpose, with snapshots taken at regular intervals during the shopping day. Such graphic counts show both the number and character of the passers-by, and so give a more dependable basis on which to judge the value of a store site.

Neighborhood stores

Neighborhoods are constantly changing. Shopping areas shift with the vagaries of taste and demand—a warning to the radio merchant against too-long leases. Natural barriers, such as hills and rivers, restrict the movement of population and of buying, or may cause new centers to break out far from the old-established shopping districts. In general, populations grow up hill. They also move out along principal automobile-traffic routes.

Because radios are home devices, there are inherent advantages in keeping the radio store as close as possible to the local public it is designed to serve. For this reason neighbor-



SIDEWALK TRAFFIC is the measure of a store's location. But it must be shopping traffic, buying traffic. And, automobile congestion may detract from, rather than add to, the radio store's selling power.

hood radio stores have proven reasonably successful when operated by the owner and one or two employees. For such a store, a location in the local neighborhood shopping center may be desirable. It may be either on the main shopping street—or a side street with a big sign calling attention to its presence.

For so remarkable is the publicity power of the word "radio" and so intimate is it to the lives of most people today, that the location of the neighborhood "radio shop" becomes fixed in the memories of the neighborhood public. Physical location may be less important in the plans of the neighborhood radio shop, therefore—particularly if the radio man uses other means of advertising, telephone calls, and publicity to call attention to his presence.

Creative selling

It is this attitude of "creative selling" which is becoming increasingly important for the radio man. H. C. Bonfig, coordinator of sales for RCA Manufacturing Co., Camden, N. J., expresses this point in a striking way in a statement to RADIO TODAY. He says:

"There are probably a good many things that our industry may well look out for in an attempt to show improvement. The safeguarding of profits for manufacturer, distributor and dealer alike should probably occupy a prominent part of our thinking. Prior to this, however, must come the rendering of goodwill building service for the consumer. The radio industry has been fortunately blessed in having enjoyed a steady and ever-increasing demand for its products from the public. We must make sure not to forfeit or jeopardize this interest.

"I believe before long it will be necessary for the industry to give serious consideration to 'creative selling,' particularly as unquestionably our business is today a trade-in business. We can learn much from other industries who have been faced with a similar problem and successfully found the answers thereto. I am inclined to believe that the thinking merchant is thirsting for knowledge of how to sell radio sets more efficiently and more profitably. The retailer who can master the art of creative and organized selling should lay a foundation for his business which cannot be shaken by the ravages of hit-or-miss operations and job-lot competition."

Coupled with the question of creative selling is the matter of store-

Second article in the series— "How to Make More Profits Out of Radio"

Topics in future issues:

Financing	Expense control
Advertising	Installment sales
Collections	Profit yardsticks

front modernization for the radio shop. For it will not be enough to have the radio store properly located, unless it also presents a pleasing and, preferably, a striking appearance.

It will probably pay few radio dealers today to own their retail-store sites. Property ownership of this kind involves too heavy an investment, and it also ties up the retailer's capital in a frozen asset which cannot be liquidated quickly in case of need. For these reasons, most retailers will prefer to rent.

There are many ways of handling the cost of store modernization when the dealer is a tenant and his store is rented. In some cases when the tenant has a long lease, he pays the entire cost of the modernization. In other cases, the cost is divided between the landlord and tenant; still in other cases, the landlord pays the entire cost without any change in the terms of the lease. Also the tenant will frequently sign a lease calling for a higher rental, providing the landlord performs the necessary modernization.

C. A. Giorgio, manager of the

Phoenix Radio Company, 409 State Street, New Haven, Conn., whose attractive store-front is shown on this page, had excellent results from a change of location and modernization. The cost of this new front (including materials from the Pittsburgh Plate Glass Company) was \$775, excluding lettering and under-work.

"However, the cost does not matter if it is productive," comments Mr. Giorgio. "Our alterations were only completed as of October 1st last and the results thus far have been very gratifying.

A change that paid dividends

"It might be of interest to know that we moved to this location in August, 1933, because the old location, which is only seven doors away on the same street, was too old a building to withstand any such modernization which we desired. In 1933 when we moved to the present location, we installed a new black-glass front and altered the new quarters to the tune of \$1,100 total, which was all charged off in the following four months from the increased business done through the change. This change was only a forerunner and a test of what we had in mind. The test proved successful and then we proceeded. In 1936 we enlarged our quarters and built this new front which we now have. We find that modern fronts and interiors are a great aid in bringing about an increased business."



STORE-FRONT is as important as store location. A striking example of modernizing carried out at New Haven, Conn. Cost \$1,100.

PROMOTION CALENDAR FOR RADIO DEALERS

Four pairs of merchants fix up a schedule of sales tricks already tried



A. Brescia, Radio & Music Shop, Jackson Heights, L. I., N. Y.



Bernard B. Walsh, Walsh Radio Service, Cleveland, Ohio



Oliver F. Klein, OK Radio Service, Milwaukee, Wis.



G. W. Clark, Carlisle Hardware Co., Springfield, Mass.

Feb. 23-28

23—If it's uncomfortably cold, advertise that you "will send a heated car" after those prospects interested in store demonstrations.

24—Exhibit a pile of sales and service slips, if they can be removed from your records. Use the same plan that pharmacists do with prescription slips.

25—Pick out the hottest news item of the day and invite prospects to an evening session at your store to hear Boake Carter discuss it through a new receiver.

26—Tell your sales staff that you'll give them a chance, one by one, to try out daring ideas in store window and interior decoration.

27—Stage a "Metropolitan Opera" party at your store this p. m. to feature the broadcast from New York.

28—Sunday.

March 1-20

1—Use a rhyme in your ads: "If your radio can't swing, better give us a ring."

2—Advise the public to "get equipped for the baseball broadcast season."

Put in a window with newspaper clippings and pictures of baseball training camp activity, against a background of portable sets.

3—Start circulating a man among recent radio buyers as a good-will gesture to check on whether "you understand fully the operation of the set."

4—Run an ad asking, "Can your radio still take it—can it reproduce those high notes, those low notes, those blue notes?"

5—Listen to a specially good short wave program personally and tell your prospects about it verbally.

6—Put an old set in your window marked in various ways with enormous figures representing upkeep costs. Theme is, "Your old set is too expensive to keep."

7—Sunday.

8—Mail a postcard sales talk to names picked up from cooking schools, fairs, demonstrations, etc.

9—Get a list of recently issued marriage licenses, congratulate the newlyweds and follow up with sales activity.

10—Get in on the Spring activity in used cars. Connect with the car dealers and work a radio into each auto sale.

11—Feature testimonials from customers who are using second and third sets in their homes.

12—Pick from your files the names of those using the oldest sets; start your servicemen calling on them "just in case."

13—Start a personal "column" in your local newspaper headed "be sure to pay enough for your next radio."

14—Sunday.

15—For a special display, blow up the page of "broadcast beauties" in this issue of RADIO TODAY.

16—Play up the broadcast schedules announced by the networks for St. Patrick's Day.

17—St. Patrick's Day. Accent the Irish among your prospects.

18—Start a campaign on "furniture cabinets for \$35 to \$65." Write on your prospect cards the home decorative scheme used in each house.

19—Collect the names of college students who will be at home for Easter vacation; prepare a "personal radio" appeal for both men and women.

20—Spring begins. Start ballyhoo for the Easter (Mar. 28) season; suggest that people should also "Dress up their homes—with a new radio."



S. C. Smith, Lieberman and Company, Lebanon, Pa.



W. B. Butcher, W. B. Butcher Electric, Wapakoneta, Ohio



Anthony "Doc" Izzo, Paramount Radio Co., Hoboken, N. J.



Starr Gephart, Hill Radio & Furniture Co., Niles, Mich.

Postage
Will be Paid
by
Addressee

No
Postage Stamp
Necessary
If Mailed in the
United States

BUSINESS REPLY CARD

First Class Permit No. 22273 (Sec. 510 P. L. & R.) New York, N. Y.

RADIO TODAY

480 LEXINGTON AVENUE

NEW YORK, N. Y.



Send me RADIO TODAY for the period indicated below:

1 Year (12 issues) \$1.00

Send bill

3 Years (36 issues) \$2.00

Amount enclosed

Name _____ Title or Occupation _____

Company _____

Street _____

City _____ State _____

Our Main Line of Business is: _____

If RADIO TODAY is to be mailed to your home, fill in address here

No stamp needed on this card—it is ready for mailing.

There is
only ONE

Silent!
RADIO

U. S. Pats. Nos. 1,011,980 and 1,630,028; other pats pending.

—the **DICTOGRAPH!**

- Made and patented by Dictograph.
- Employs the tonal fork principle.
- Uses the Acousticon Mystic Ear.
- Transmits sound by bone conduction.

WARNING

The Acousticon Mystic Ear is not an earphone or miniature loud speaker. All makeshift arrangements to imitate Dictograph Silent Radio are not only infringements but are dangerous to listeners. Genuine Silent Radio is safe. It is obtainable only in the Dictograph or from Dictograph licensees.

Notice is hereby given that all infringement of patents, trademarks, copyrights, etc., covering Dictograph Silent Radio and its essential unit, the Acousticon Mystic Ear, will be vigorously prosecuted.

Only Good Things Are Imitated!

• When you feature the Dictograph Silent Radio, you start from scratch. *Everyone* is a prospect, radio-owners as well as non-owners—for this radio is absolutely non-competitive compared with all the conventional loudspeaking sets on the market. The Dictograph Silent Radio puts into your hands a brand new sales argument, growing out of its ability to make listening either a personal experience or a group experience at the turn of a switch. Dealers who have appreciated this fact are reaping a harvest of sales; you should be one of them. Incidentally Dictograph Silent Radio is the only practical radio for trailers today.

Get the facts about this astonishing set that is revolutionizing the radio industry. Learn how it can build *your* income.

Return the coupon today.

DICTOGRAPH PRODUCTS CO., INC.

Executive Offices:

580 FIFTH AVENUE NEW YORK, N. Y.



The Tuning Fork . . . Strike it! Hold it to the ear! Little or no sound is emitted.

But press it against a table and the table is put into resonance—vibrates—gives forth a musical note; right.

The Acousticon Mystic Ear functions on the tonal fork principle. Hold it in your hand—hardly a sound.

But put the Mystic Ear behind a pillow, lean your head against the pillow—and you hear! Remember—60% of that sound is heard through bone-conduction, inaudible to others even a few feet away.

Dictograph Products Co., Inc. RT-2
580 Fifth Avenue, New York

Please send me further information concerning your Dictograph Silent Radio proposal.

NAME _____
ADDRESS _____
CITY _____ STATE _____
I am a retailer ; I am a wholesaler



Home groups, artists, schools are prospects for quality recorders like Presto's.

PROFITS FROM RECORDERS

★ **CERTAIN FLOURISH** in the sound recorder business is traceable to the appearance of new instruments designed to interest those thousands of persons and organizations who wish to make discs of their own.

Many radio dealers who have stocked the apparatus discovered a surprising number of prospects. Groups of interested persons appear from unexpected directions, adding a fat slice of extra profit to the dealer's books.

Radio men may either sell the instruments themselves at prices ranging from \$129 to \$600, or they may buy one instrument and make records for customers at average charges of \$1.50 for 6" discs to \$5 for 12" ones.

Recorders themselves have been engineered to a new point of dependability and precision. Until recently, the sound experts among radio dealers may have been critical about the quality of the average recorder on the market, but today the merchandise is generally regarded as OK.

New trend is due also to the fact that record materials have been finally perfected so that they are cheaper and 100 per cent capable of satisfactory performance. Voices may be recorded today with ease and dispatch; records are played back immediately with excellent results.

Dealers report that schools, singers, orchestra leaders, music teachers and

"social lions" are attracted in large numbers. Store traffic is crowded with the right sort of persons—those who are interested in higher-priced instruments and are able to buy.

Home recorders lend themselves well to feature advertising and they fit neatly into radio demonstrations. They can be used as P.A. systems and they make sure-fire attractions when displayed in windows. Considerable interest has been worked up among radio fans who wish to record favorite programs, or to assemble a "musical library." These gadgets have the curious quality of attracting the serious groups of educators who want to use the recorders in classrooms, as well as the non-serious people who want a novelty in their homes for entertainment purposes.

Opportunities galore

One recorder manufacturer reports international acceptance among schools, ranging from junior high schools to the University of Madrid. Another firm has received many success stories from dealers who sell to home movie fans, professional entertainers and wealthy homes.

In some cases, manufacturers offer a prompt pressing service to dealers who want a number of permanent records made from an original. This is important when orchestras or

HOT PROSPECTS FOR MACHINES

- ACTORS**, testing the quality and range of their voices.
- ADVERTISING AGENCIES**, requiring a recorded library of clients' programs.
- ANNOUNCERS**, interested in self-criticism.
- ARTIST BUREAUS**, preparing to re-play auditions.
- AUDITION STUDIOS**, circulating suggested air shows.
- BROADCASTERS**, filing programs, extending coverage via records, etc.
- CHORAL DIRECTORS**, checking harmony effects.
- CHURCHES**, using repeat sermons.
- COMMENTATORS**, selling themselves to stations.
- COMPOSERS**, recording when inspired.
- CONSERVATORIES**, analyzing voice development.
- COURT ROOMS**, replacing court reporters.
- DETECTIVES**, secretly recording various types of evidence.
- DOCTORS**, specializing in throat ailments, heart diseases, etc.
- JAILS**, keeping a record of important conversations.
- HOME MOVIE FANS**, requiring sound accompaniment.
- INSTRUMENTALISTS**, checking and comparing performances.
- LANGUAGE INSTRUCTORS**, teaching accent and inflection, checking defects.
- LAWYERS**, filing statements of legal importance.
- LECTURERS**, presenting samples to possible sponsors.
- MUSIC STUDENTS**, recording their progress, checking their flaws.
- MUSIC TEACHERS**, demonstrating right and wrong methods.
- NEWSPAPERS**, re-broadcasting their commentators at publication time.
- NIGHT CLUBS**, recording applause for broadcasts later.
- ORCHESTRA LEADERS**, checking all instrumental effects.
- PARENTS**, desiring a record of their children's voices.
- POLICE DEPARTMENTS**, recording unexpected testimony.
- RADIO ARTISTS**, studying microphone technique.
- RADIO FANS**, collecting favorite radio programs.
- RECORD COLLECTORS**, compiling a series of novelty discs.
- SALES DIRECTORS**, re-playing sales plans, speeches, outlines.
- SEMINARIES**, preserving the remarks of church leaders.
- SCHOOLS FOR THE DEAF**, requiring special sound effects.
- SOCIETY LEADERS**, seeking home entertainment novelties.
- SOLOISTS**, checking their performance, selling themselves.
- SOUND EFFECT SPECIALISTS**, recording rare effects on the spot.
- STUDIO DIRECTORS**, checking program effectiveness, changes, etc.

choral groups make records and arrange for each member to order one.

Radio men will also discover that local clubs want recorders in order to record speeches made on special occasions. This business works in neatly for those already in the sound market.

(Continued on page 42)

TUBES AS SALES WEDGES



SHELF OF CONTACTS, each tube representing an "opener" among customers who will later buy other radio and electrical merchandise.



READY TO GO, jobbers' salesmen organize new tricks to aid dealers in selling more tubes as distinct sales wedges.



DOUBLE CHECK on the dealer's tube stocks so that he has up-to-the-minute stuff, is early on this new selling schedule.



GOD-AWFUL TRUTH about how fans are themselves blundering around with sick receivers is stamped on the dealer's mind.



SERVICE MEN MOVE into the picture as they pick up the new attitude toward tubes now regarded as the perfect sales-catchers.

Photos from RCA talking film produced by AudiVision, Inc.

MODERN SOUND SELLING

- ups and downs of public-address installations
- dealer must know how to handle acoustic problems

CONTRACTING FOR SOUND INSTALLATIONS

★ "Sound equipment is a fertile field but there have been many misleading and unfortunate conditions created in this business. The manufacturer, jobber, and dealer have all contributed to the existing chaotic conditions," declares Sakio Oura of International Radio & Sound Service, 209 Massachusetts Avenue, Boston, Mass.

"The dealer himself, in a large measure, is responsible for the conditions in the industry. He has made poor installations, used homemade equipment and antique merchandise, disregarded the Underwriters' rules regarding wiring, and created a false impression in the public mind as to the value of a sound installation.

"The sound dealer is and should consider himself an electrical contractor. The electrical contractor makes good installations as far as wiring and accessibility of controls are concerned, but unfortunately has very little knowledge of the sound equipment or acoustics. The majority of sound prospects have to be contacted. A very small percentage come to your place of business to buy sound equipment as a 'packaged article' such as appliances or radio sets.

"Architects, contractors, amusement owners, and all the various places where sound equipment is needed must be contacted! It is necessary to have constructive advertising and an intelligent understanding of the business and methods to which equipment can be employed.

Must sell prospects

"It is also essential to have very definite labor charges in the installation of any job and these should be in accord with the charges made by other trades installing similar equipment such as oil burners, commercial refrigeration, and motion-picture equipment. Another requisite is finance but with the manufacturer supplying time-payment plans this difficulty has been overcome."

SOUND TO THE RESCUE

★ W. L. Fuller, Jr., of the Fuller Specialty Co., Parkersburg, W. Va., reports that his company's sound truck played an unusual and important part in the flood crisis in that area. Fuller truck was used to direct traffic and boats during the confusion.

"We were instructed," writes Mr. Fuller, "by the Sergeant of the State

Police and the Captain of the City Police, as well as the county safety officials, to advise persons to leave the flooded areas unless they had legitimate business there."

Loudspeakers on the truck broadcast the advice that extra cars in the danger zone only added to the congestion and obstructed relief activity.

LISTENERS SET 30 DB AS INTERFERENCE LIMIT

★ Over his high-fidelity broadcasting station WQXR, New York City, John V. L. Hogan, well-known consulting engineer in radio, has been conducting a series of tests and demonstrations to find within what limits listeners find tolerable the interference of extraneous sounds or another program. Two voices or programs are mixed at differing levels of 10, 20, 30, 35 and 40 decibels, and listeners are asked to report the difference at which interference ceases with the primary program.

"Even on speech interference the difference in level should be at least 30 db," comments Mr. Hogan after reviewing responses from a recent test. "Out of 73 reports, 34 emphasized the fact that the difference should be more than 30 db; 29 said that 30 db was satisfactory, or nearly so; only 8 selected 25 db as tolerable, and only 2 were willing to put up with 20 db difference. The few who picked low values also spoke of having considerable noise interference, which of course accounts for their tolerance."

This seems to break down the former superstition that a 20-to-1 voltage ratio is interference-free. Mr. Hogan will continue the tests over WQXR on the first evening of each month, during the coming spring.

556 LOUDSPEAKERS

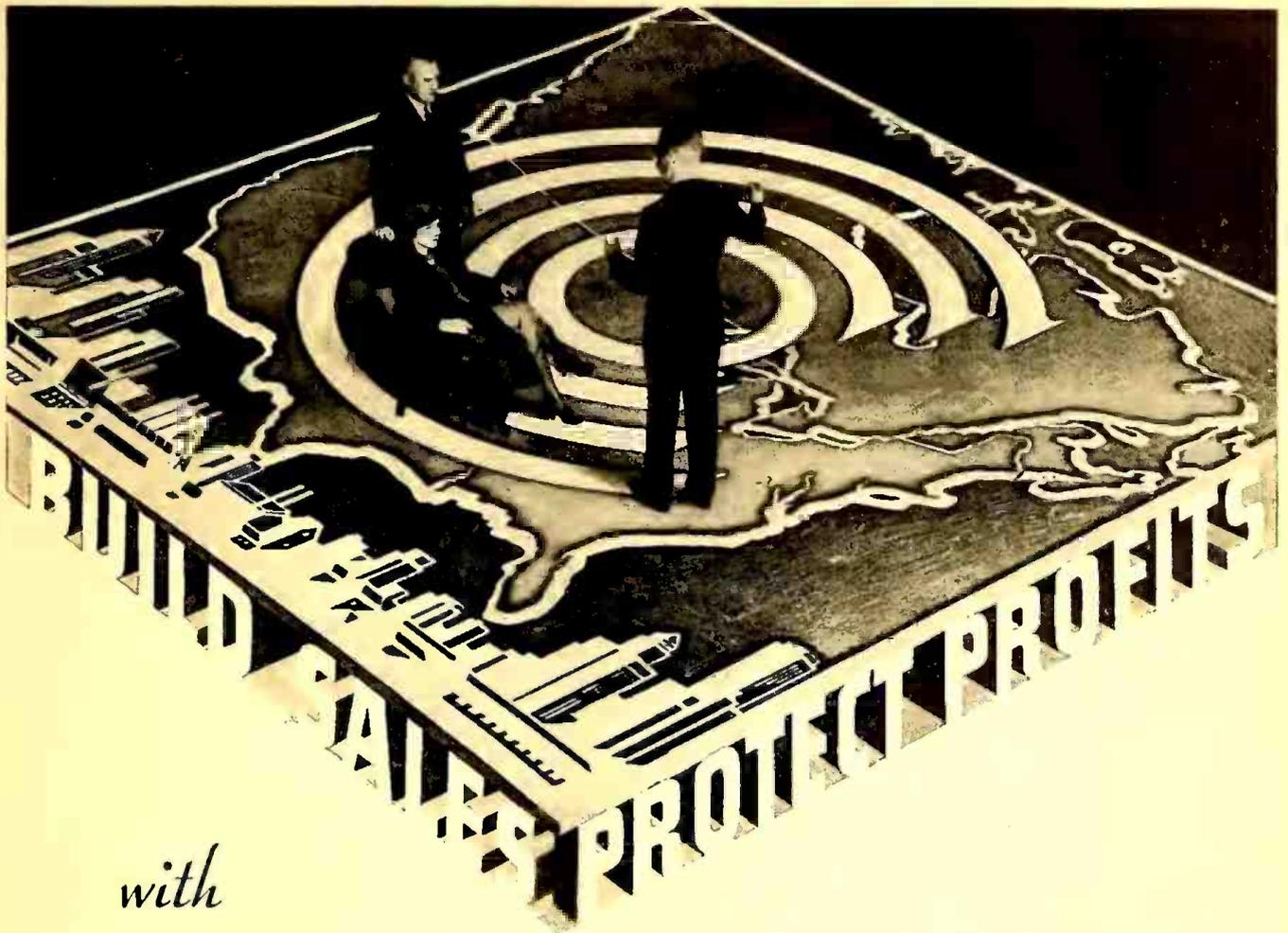
★ Example of profitable P.A. activity comes from the Eastern Co., Alan Steinert's alert RCA jobbing organization of Boston, Mass. This month the commercial sound section of the firm, headed by "Dusty" Rhodes, will receive cash payment totalling \$15,000 from one of the important local hotels, the Parker House.

Final plans call for the installation of loudspeakers in each of the 556 guest rooms of the hotel. Four listening channels will be provided, from which guests may select their favorite programs from the four major broadcast networks.

DESIGN FOR THE FORE AND AFT SPEAKERS ON A MODERN SOUND CAR



FOR A DRIVE among sound prospects, here's a typical Operadio installation.



with

COMMERCIAL CREDIT COMPANY FINANCING

GET READY for a big buying year in 1937. A country that thought it was flat on its back is now very much back on its feet and going places.

Well up in the list of intended purchases are radios, refrigerators, automatic heaters, appliances that promise to be the targets of mass-buying on the deferred payment plan.

With Commercial Credit Company financing you can be sure of closing a higher proportion of sales. Intensive national advertising is telling millions of buyers the advantages of Commercial Credit Company's

liberal terms and low cost. Buyers have confidence in the integrity and reliability of the time payment plans of this *twenty-five year old* nationally known service.

Commercial Credit Company service gives dealers fullest protection against loss from failure to complete payments. An experienced, smooth working credit investigation and collection system, operated through 178 local offices in principal cities of the United States and Canada assures you the cream of the business, prompt remittances, and freedom to concentrate on your sales.

COMMERCIAL CREDIT COMPANY

COMMERCIAL BANKERS
CONSOLIDATED CAPITAL



HEADQUARTERS: BALTIMORE
AND SURPLUS \$60,000,000

FINANCING SERVICE FOR MANUFACTURERS, DISTRIBUTORS AND DEALERS THROUGH 178 OFFICES IN THE UNITED STATES AND CANADA

Amazing ARVIN Achievements

VASTLY IMPROVE CAR RADIO

● You'll make more car radio sales and profits than you ever thought possible with the new Arvins. They achieve what your customers have always wanted in car radio: Reception as perfect as you get on the finest home set. The Arvin Phantom Filter is only one of the many exclusive Arvin developments. It's a remarkable "booster station" that doubles the number of stations you get—filters out noise and vastly improves performance. With the Phantom Filter and its magic helpers, you have a new brilliance and clarity of tone undreamed of in car radio. See your jobber for full details.

NOBLITT-SPARKS INDUSTRIES, INC., COLUMBUS, INDIANA
 Also makers of Arvin Rhythm Radios for homes and Arvin Hot Water Car Heaters

...ASK YOUR
 JOBBER ABOUT
THE ARVIN
 FLOOR PLAN DEAL



● Tailor-Fit Overhead
 Speakers, In-the-Set or
 Separate Case Speakers
 with beautiful deep
 tone. Matching panel
 controls and universal
 controls for all cars.

Tailor-Fit **ARVIN** Car Radio

WITH THE
Phantom Filter



3 new Tailor-Fit Radios
 2 marvelous 6-tube
 sets and a 7-tube
 per-deluxe radio. Wide
 choice of control and
 speaker equipment.
 Complete set prices as
 low as

\$39.95
 LIST

ONLY
ARVIN HAS
 The Phantom
 Filter

ONLY
ARVIN HAS
 The Automatic
 Eliminoise

ONLY
ARVIN HAS
 Permatune
 Transformers

ONLY
ARVIN HAS THE
 Geographical
 Compensator
 and Other New Features

NOW SELL INTERCOMMUNICATORS

- new plug-in telephones profitable line for radio dealers
- tube amplifier equipment logical adjunct to radio service

★ "Packaged communication" is a new convenience for the business public—a new line for the radio dealer.

It means that the radio merchant can now offer a plug-in intercommunicating system ready for attachment anywhere. "Just plug in—and talk!"

Some of these systems employ an interconnecting talking wire between the instruments. Others utilize a carrier-current principle which uses the electric-light wires themselves as the transmitting medium.

In practically all of these systems, the persons talking need to speak only in an ordinary tone of voice, at a distance of several feet from the instrument. The sensitive pick-up responds to this sound, which is then reproduced by the distant loudspeaker in the set at the other end. Thus conversations can be carried on without the inconvenience of handling telephone receivers—with both parties conversing as freely as if they were talking in the same room.

Some of the systems are designed for two-party conversation: others are provided with selector switches so that any one or more of a number of stations can be reached.

Installed on the desks of principal executives, these outfits enable busy men to talk with each other or with their secretaries. Telephone operators use them to announce calls and callers. In the offices of doctors and

LIKELY USERS OF INTERCOMMUNICATING SYSTEMS

- | | |
|-----------------|--------------|
| Banks | Nurseries |
| Dentists | Offices |
| Depots | Police |
| Docks | Post Offices |
| Doctors | Restaurants |
| Factories | Radio Fans |
| Farms | Sanitariums |
| Garages | Schools |
| Homes | Ships |
| Hospitals | Stores |
| Truck Companies | Trailers |
| | Warehouses |

dentists, for announcing patients they have the advantage that the professional man does not have to stop to pick up a telephone and answer it, and then go through the routine of cleansing his hands antiseptically before returning to his patient. The dentist can talk with his outer office without leaving his operating chair.

In banks, tellers can talk with bookkeepers. In restaurants, counter men can give orders to the kitchen. In shops and factories, superintendents can talk with foremen in various production offices scattered around the plant. In movie theatres, the man-

ager can communicate with the operators in the projection booth, in garages, the front office attendant can reach men on various floors and order customers' cars brought down.

Even in homes, these handy intercommunicating systems have many uses. The mistress of the house, from her bedroom, can give orders to her cook and chauffeur. Sets can be moved about, so that later in the day other rooms can be contacted. Bridge-playing mothers have placed intercommunicating phones in childrens' sleeping rooms so that they might detect the slightest cry of their infants, without leaving the card table. And in cases of sudden and chronic illness, these convenient loudspeaking telephones placed one in the sick room and the other downstairs, have enabled the sick person to take part in the life of the family, listen to the living-room radio, or call for aid.

Today's list of manufacturers of intercommunicating systems is long and impressive:

- Allied Radio Corp. Chicago
- American Automatic Electric Sales Co., Chicago
- American Carrier Call Corp., New York City
- Amplifier Co. of America, New York City
- Amplion Production Corp., New York City
- Bell Sound Systems, Columbus, Ohio
- David Eogen Co., Inc., New York City
- Columbia Sound Co., New York City
- Connecticut Telephone and Elec. Co., Meriden, Conn.
- S. H. Couch Co., N. Quincy, Mass.
- Dictograph Products Co., New York City
- Edwards Co., Bronx, N. Y.
- Electro Acoustic Products Co., Fort Wayne, Ind.
- Electronic Sound Labs, Inc., Hollywood, Calif.
- Electrux Sound Systems, Minneapolis, Minn.
- Executone, New York City
- Federated Purchasers, Inc., New York City
- Fox Sound Equipment Corp., Toledo, Ohio
- Fulton Radio Corp., New York City
- Gates Radio & Supply Co., Quincy, Ill.
- Holtzer-Cabot Electric Co., Boston, Mass.
- Industrial Amplifying Systems, New York City
- International Business Machine Corp., New York City
- La Salle Radio Corp., New York City
- Laurehk Radio Mfg. Co., Adrian, Mich.
- Fred M. Link, New York City
- Lipman Engineering Co., Pittsburg, Pa.
- Miles Reproducer Co., New York City
- Operadio Mfg. Co., St. Charles, Ill.
- Philco Radio & Television Corp., Philadelphia, Pa.—see photo p. 45
- Public-Ad, Inc., Cleveland, Ohio
- Radio Amplifiers Labs., New York City
- Radolek Co., Chicago
- Radio Receptor Co., New York City
- Remler Co., Ltd., San Francisco
- Segelsound, Inc., Gardner, Mass.
- Simplex Radio Co., Sandusky, Ohio
- Sound Systems, Inc., Cleveland, Ohio
- Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y.
- Transformer Corp. of America, New York City
- Turner Co., Cedar Rapids, Ia.
- United Scientific Labs., Inc., New York City
- United Sound Engineering Co., St. Paul, Minn.
- Universal Microphone Co., Inglewood Calif
- Webster Co., Chicago
- Webster Electric Co., Racine, Wis.
- Western Sound & Electric Labs., Inc., Milwaukee, Wis.
- Wholesale Radio Service Co., Inc., New York City



HANDY SYSTEMS like this Dictograph fit in wherever there's inter-room talk.

MORE MONEY IN PARTS

★ "THE jobber to dealer-service-man branch of the radio parts industry has grown to big-business proportions. It has been variously estimated that 1936 saw more than \$35,000,000 worth of parts change hands through these channels, and this is probably a conservative figure. More than 600 recognized parts jobbers are catering to some 30,000 established dealers and servicemen, and to an even greater number of part-time servicemen," declares R. M. Karet, director of sales, Wholesale Division, Utah Radio Products Company.

"Unfortunately, the majority of those engaged in the parts business are not making money. It is my purpose to point out some of the weaknesses of present parts merchandising methods and to offer suggestions as to how a losing, or bare-living, business may be turned into a real money-maker. Because the jobber is the first step after the manufacturer in the process of distribution we shall consider his problems first.

Jobber weaknesses

"The major detrimental factors involved in the jobbing of radio parts are not many, and may be briefly summarized. Every jobber will recognize one or more of his own weaknesses in the following list:

1. Low unit of sale.
2. High percentage of returns and exchanges.
3. Multiplicity of lines.
4. High sales expense.
5. Cut-price competition.

"A low unit of sale is considered by many as a necessary evil in the sale of parts. Perhaps so. The fact remains, however, that any sound business man must view with alarm a business which is supposed to operate on a wholesale basis, yet in which fully half the sales amount to less than \$5, and a goodly percentage are even under \$1. Such a business must have an unusually high percentage of profit and a low percentage of sales cost to survive, or the unit of sale must be increased.

"A high percentage of returns is ruinous to the profit side of the ledger. There is the expense of handling, the shipping expense, the customer ill-will, and occasionally the loss of the customer entirely, plus the fact that a percentage of the jobber's capital is always tied up in goods in transit. We know of one parts man-

ufacturer whose return from jobbers exceeded 10 per cent of his total jobber shipments one year. It is obvious that such returns cut deeply into profits.

Multiple lines

"Multiplicity of lines as a sound merchandising policy is something that may be argued both pro and con. With rare exceptions all parts jobbers operate that way, their reasoning being that each parts manufacturer through his advertising and other promotional means has built up a certain amount of trade acceptance, of which they wish to take advantage. They prefer to have exactly what the customer calls for, rather than attempt to switch him.

"Yet the disadvantages of multiplicity are obvious. Duplicate stocks must be carried, increasing the investment and decreasing the turnover. Because no one line is featured, no great amount of sales effort can be expended. Because sales are divided, no one manufacturer secures a satisfactory volume, and in order to bring his sales up to what he considers normal for the territory, he is forced to appoint additional jobbers in the same territory. The result of all this is that several jobbers are trying to sell the same merchandise to the same customers and that situation always leads to price cutting and sharp practice, the ultimate victim, as usual, being the profit sheet.

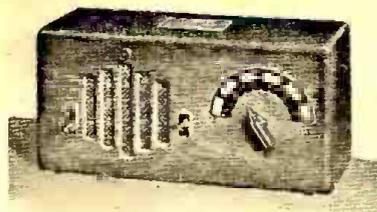
"The last two items are to a great extent the offspring of the first three, and to that extent are automatically alleviated when the other conditions are corrected.

Selling up values

"Now let us see what method of attack is most likely to overcome these existing unsatisfactory conditions. To our way of thinking, the answer is both simple and obvious. A *selling* job is indicated, and the thing to be sold must be of sufficient value to the serviceman and dealer that he is more than willing to pay the price demanded, the price in this case being *elimination of the aforementioned unsound business practice.*

"We believe, after considerable investigation, questioning and cross questioning, that the thing that a dealer or serviceman wants most of all from his jobber is *service.* Service in

(Continued on page 42)



NEW

**Key to volume and profits
in a tremendous market**

Electro-Call

**2-way and multiple
communication system**

MODERN—SPEEDY—EFFICIENT

EASY to install and easy to operate. Direct communication between 2 points, with model No. 200 and between master station and two to six outlying stations with model No. 202.

SELLS TO

**Factories Hotels
Restaurants Offices
Shipping Depts.
Schools Libraries
Public Buildings**

wherever inter-departmental or instant conversation is required

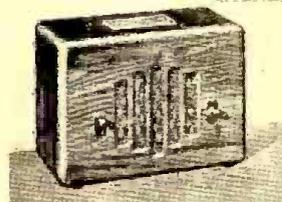
This revolutionary new device simply plugs in, and gives perfect amplified sound by merely pressing down on the "talk-listen" key!

Merchants all over the country have sensed the universal value of ELECTROCALL and are making a clean-up by selling it to their patrons in a hundred lines of business.

No installation or service headaches. No competition with other so-called intramural communication systems. AC or DC current, consumption negligible. Speeds up office efficiency, keeps phone lines open for incoming calls.

A beautiful **MERCHANDISING** weapon for the modern electrical wholesaler!
Write for all the facts

UNITED SCIENTIFIC LABS., Inc.
62 West 11th Street New York City



UNDERSTANDING AMPLIFIER OPERATION & CIRCUITS

Discussion of the factors affecting gain, output, and distortion*

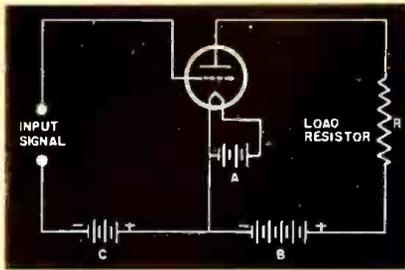


Fig. 1—Typical amplifier circuit having a resistance plate load.

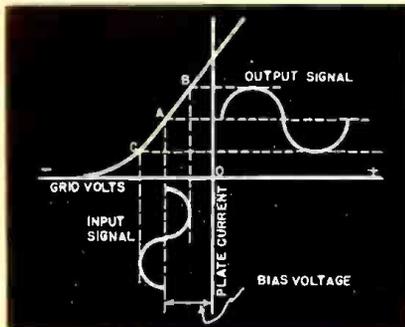


Fig. 2—Operating characteristic of a tube biased to the mid-point "A" of its linear (straight-line) portion.

★ In radio servicing discovery of the symptoms or trouble with a receiver is often but a small part of the job of actually repairing the receiver. Real problem is to find out exactly what the cause is—fortunately the newer types of service equipment aid in rapidly tracing down the faults.

With the cathode ray oscillograph it is usually simple to localize the

difficulty to a single stage of the set. But to find out exactly what part (or parts) is the source of trouble requires a good understanding of the tube's function in respect to its associated circuits. The aim of this article is to point out how an amplifier works—and what are the effects of varying the associated voltages and parts.

The simplest type of amplifier is shown in Fig. 1—a resistance coupled triode. In the discussion it will be assumed for simplicity that the tube works into a resistance load—practically, this assumption may or may not be true, but basically the operation is the same, even in I.F. amplifiers.

Amplifier theory

In Fig. 2 is shown a characteristic curve of an amplifier tube—it is the variation in plate current for grid voltage changes. As the grid goes negative the plate current decreases—plate voltage held constant.

For ordinary operation the tube might be biased on the characteristic at the point A, which is the mid-point of the straight-line characteristic B-C. If a signal is applied to the grid as indicated by the waveform drawn vertically, the plate current of the tube will vary in a manner as indicated by the horizontal wave. These current variations on the plate load resistance cause similarly-shaped voltage variations across the resistance. It will be noticed that the part of the

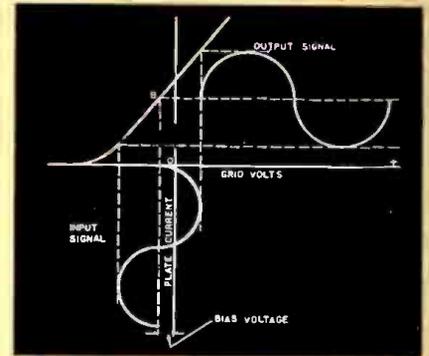


Fig. 3—Underbiased amplifier operation in which the grid is allowed to go positive for part of the cycle.

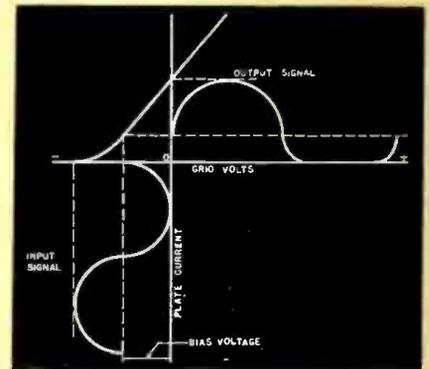


Fig. 4—Overbiased operation gives plate current cut-off when the grid goes through the negative part of the cycle.

characteristic utilized is straight-line or linear—therefore the output is not distorted.

But let's assume that the tube is biased to point B as in Fig. 3. The part of the characteristic used is still straight, but the tube is operated so the grid goes positive—this means that grid current will flow. While the amplifier tube itself does not introduce any distortion—severe distortion may be present if the grid driving source is incapable of supplying the power required by the grid without distorting. (This example is to show that a straight-line amplifier characteristic in itself does not always mean distortionless output.) Fig. 3 does show, however, that the output is the same as the input voltage.

Over-biased operation

Fig. 4 represents a highly biased amplifier capable of handling large signals before grid current flows. The

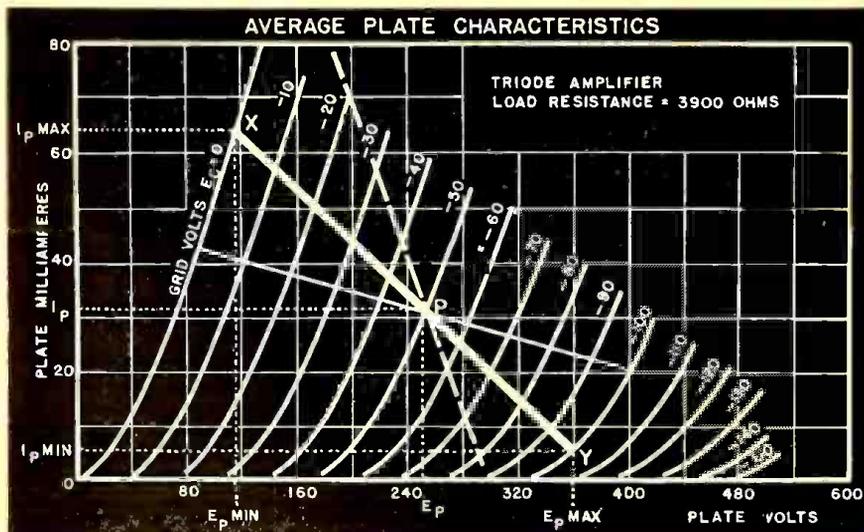
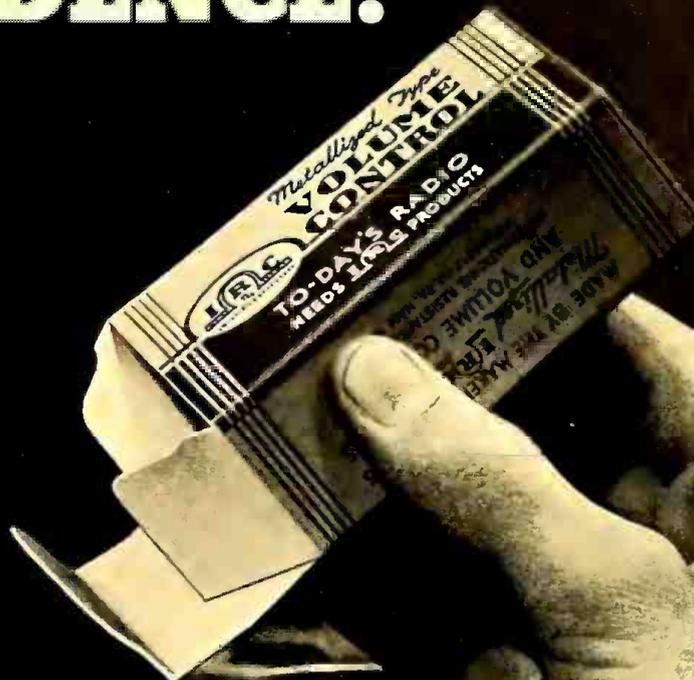


Fig. 5—Triode amplifier with 250 plate volts and -50 grid can be operated into any value of plate load resistance with varying results. Line X-P-Y represents a normal load of 3900 ohms—for class A operation X & Y represent to limits with corresponding maximum and minimum instantaneous plate voltages.

*Based upon a talk given before chapter meetings of the New York and Mt. Vernon sections of the I.R.S.M. by Vinton K. Ulrich, Service Editor of Radio Today.

*"I can use These
Controls with
CONFIDENCE!"*



Metallized
**VOLUME
CONTROL**

**• PERMANENT • QUIET •
• RUGGED •**

LOOK IN RIDER'S MANUAL (Index to Volume 7) for complete IRC Volume Control Replacement Guide.

HANDY POCKET-SIZE GUIDE FREE to bona-fide servicemen upon request to IRC jobbers.

INTERNATIONAL RESISTANCE COMPANY

401 NORTH BROAD STREET, PHILADELPHIA, PA.

Factories or Licensees in Canada, England, France, Germany, Italy, Denmark and Australia

MAKERS OF RESISTANCE UNITS OF MORE TYPES, IN MORE SHAPES, FOR MORE APPLICATIONS THAN ANY OTHER MANUFACTURER IN THE WORLD

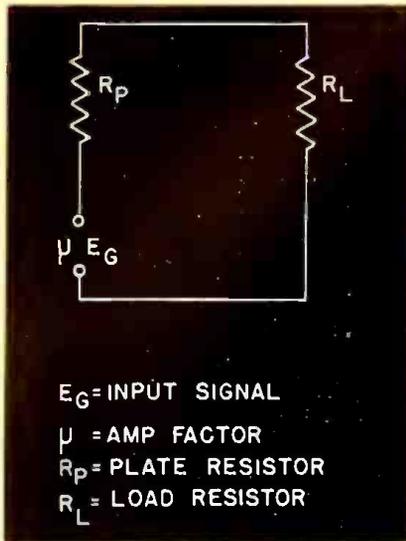


Fig. 6—An amplifier can be thought of as a circuit with the plate impedance R_P in series with the plate load R_L .

tube is biased to point C—the lower end of the straight-line (linear) characteristic. While the grid does not go positive, this type of operation will produce much distortion. From the sketch it is evident that the positive signal peaks will be amplified linearly, but the negative peak will not because of curvature of the characteristic. Note how the lower half of the plate current wave is distorted. (In push-pull operation this plate current cut-off is compensated for by the second tube in the circuit, and low distortion usually results.) For a single tube amplifier, this type of operation is very unsuitable.

Comparing the results of Figs. 3 and 4—it is apparent that under-biasing may cause distortion on the upper half of the cycle when grid current flows. Over-biasing will cause distortion of the lower part of the

current wave. With the oscillograph the difficulties can be seen upon inspection. Without visual analysis, the distortion source can be found by a close study of the operating voltages and applied signals.

Plate current characteristics

While Figs. 2, 3, and 4 are quite suitable for explanatory purposes, their practical application is not satisfactory. When it is desired to design or check upon the operation of amplifiers, a complete family of characteristics curves is desirable. These are shown in Fig. 5 for a triode power amplifier. Note that each curve is drawn for a constant grid voltage—and the curves represent plate voltage vs. plate current.

Point P is taken as the normal operating (or quiescent) point, as measured with ordinary volt meters. The plate voltage is 250, grid -50 , and plate current 34 mills—typical operation for the type 45 tube. In order to find out how the tube operates, it is necessary to draw in a load resistance line. This is represented by X-Y and is 3900 ohms. (If X-Y is extended to intercept the voltage and current scales, and the *voltage value* divided by the *current value*, a value of 3900 will be obtained, the desired resistance.) While any value of resistance might have been used, past experience shows 3900 to be suitable for this particular tube.

The load line represents the portion of the tube characteristics that are utilized.

From this drawing the operation of the amplifier can be traced. As the grid goes less negative the plate current will increase and vice versa—and the instantaneous plate current can be obtained for any grid voltage,

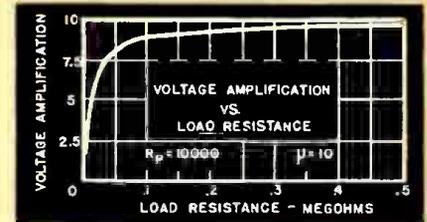


Fig. 7—Voltage amplification is dependent upon the value of plate load resistance employed—curve given for triode.

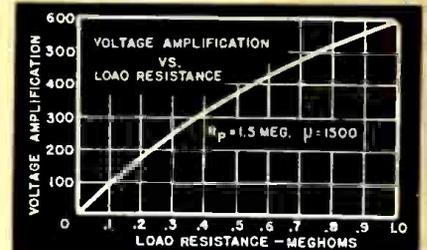


Fig. 8—Amplification available from a typical screen grid tube.

the current is given at the intersection of the grid voltage curve and the load line. During the cycle, the tube operates along the load line—only those values of plate current and voltage as indicated by the load line are possible.

Distortion check

Assuming an input signal with a peak equal to the bias voltage, the operating limits are prescribed by the minimum plate voltage E_{min} and maximum plate voltage E_{max} with corresponding maximum and minimum plate current I_{Pmax} and I_{Pmin} . A rough measure of the amount of distortion produced in an amplifier can be quickly made by measuring the lengths of the load line X-P and P-Y. For distortionless operation the two sections should be equal—but for grid swings such as the one we have (0 to 100 volts), the lines are not equal. X-P is some 15 per cent longer than the P-Y which is not a serious difference. A maximum variation of 20-22 per cent can usually be tolerated. (These percentages are not per cent distortion.)

The choice of operating voltages and load resistance are the factors affecting the distortion for any particular type of tube. Take for instance, if the bias had been taken as 60 volts with a 50-volt swing. This is done on the diagram by dropping point P to the 60-volt grid line. The operating points would have been limited by the instantaneous grid voltages $E_g = -10$ and -110 . The variation in length between the new X-P and P-Y would have been much greater. When the bias E_g is about -60 volts, it represents operation like that discussed for Fig. 4.

The heavy dotted line indicates a
(Continued on page 55)

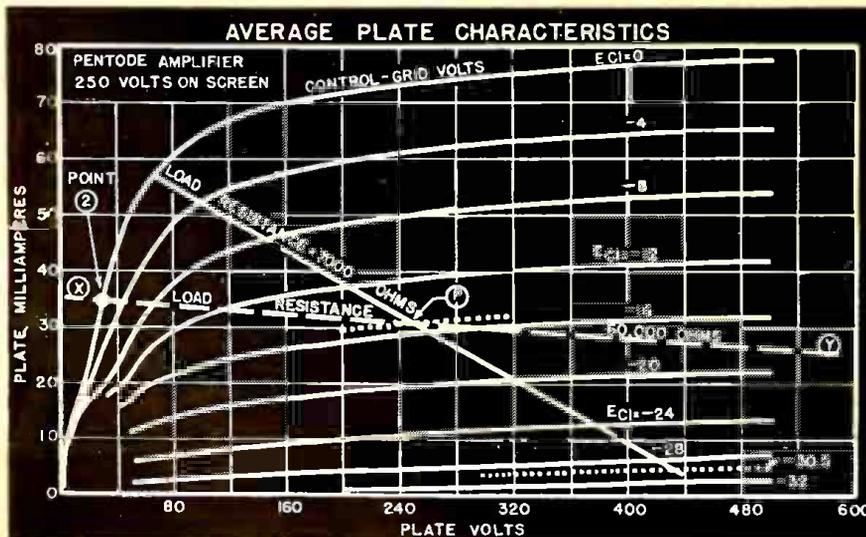


Fig. 9—With the pentode amplifier the curved portion of the characteristics at the left is a source of distortion. A high load resistance provides a greater voltage amplification, but with large grid swings much distortion is present.

IN THE EIGHT MILLION RADIO SETS BUILT IN 1936, MORE THAN SEVEN MILLION HAD ONE OR MORE MICAMOLD COMPONENTS



Leading set manufacturers always consider quality as the paramount factor when selecting components. The fact that Micamold parts are used in

seven out of eight radio receivers is proof beyond question of doubt that no better nor more dependable condensers and resistors can be found. Quality is just as important to the service man as it is to the set manufacturer. Work well done, with dependable replacement parts, makes satisfied customers and builds a reputation.

The service man can take advantage of the research facilities of the best of the set manufacturers by using the same brands of parts that he finds in original equipment.

Micamold products are more conservatively rated. Test Micamold dry Electrolytics against any other similarly rated condensers. The results will convince you. Micamold Replacement parts are inexpensive.



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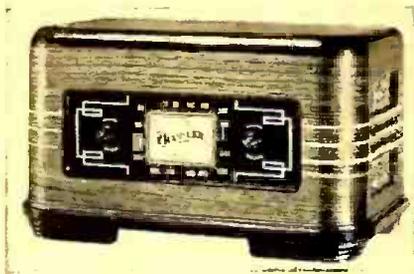
CITY STATE

JOBBER'S NAME R. F.



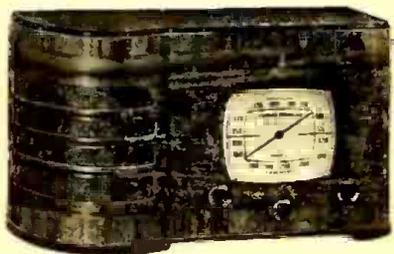
NEW THINGS FROM THE MANUFACTURERS

Trav-Ler receiver



★ 5-tube AC-DC tuned radio frequency table receiver. Tunes 520-1730 KC. Power output 1 watt. 8½-inch 4-color illuminated dial. 5½-inch dynamic speaker. Walnut cabinet with speaker at the end. Model 502—list \$18.95. Trav-Ler Radio & Television Corp., 1036 W. Van Buren St., Chicago, Ill.—RADIO TODAY.—See also advt. p. 33.

Emerson receivers



★ Two new sets have been added to the Emerson line. Illustrated is the R-153 5-tube AC superhet. Tunes 540-4000 KC in 2 bands. 6-inch dynamic speaker—power output 3 watts. Power line filter and wavetrap. Tone control and AVC—Gemloid dial. Acoustically constructed cabinet. List \$26.95. Model R-158 same chassis as above but different cabinet—list \$29.95. Emerson Radio & Phonograph Corp., 111 Eighth Ave., New York, N. Y.—RADIO TODAY.

Zephyr crystal pick-up



★ Phonograph pick-up using crystal element. Wide range up to 10,000 cycles. Needle-tilt method reduces tracking error to a minimum—improves reproduction and increases record life. Streamlined in moulded black Bakelite. 10½-inch arm—record pressure of 2 ounces. Model 99A—list \$12. Shure Brothers, 225 W. Huron St., Chicago, Ill.—RADIO TODAY.

Presto recorder

★ Instantaneous recorder for acetate or aluminum records. Has volume indicator meter and crystal mike. Complete with 4-stage amplifier and loudspeaker. Cast aluminum turntable with heavy rim prevents "wows." Light crystal pick-up for play back. Compact and portable. Model D. Presto Recording Corp., 139 W. 19th St., New York City.—RADIO TODAY.—See also advt. p. 42.

Masterpiece receiver



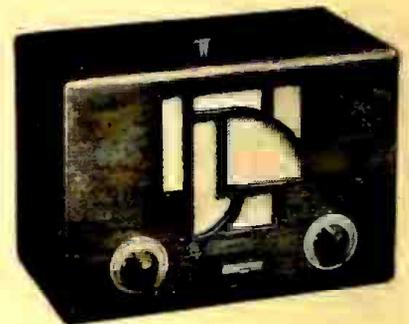
★ Masterpiece V set with full-range bass reception. Acoustically designed and treated cabinet provides reproduction from 30-9000 cycles. Back of console completely enclosed except for ports or openings in the rear which utilize the back wave of the speaker. Set uses an 18-inch Jensen speaker. McMurdo Silver Corp., 2900 S. Michigan Ave., Chicago, Ill.—RADIO TODAY.

Factory call system



★ Amplifier system designed for factory installations. Flexibility of equipment adapts equipment for all sizes of installations. Simplicity of installation obtained by use of permodynamic speakers—only two wires to each speaker. Wall, desk, projector type speakers available. Webster Co., 3825 W. Lake St., Chicago, Ill.—RADIO TODAY.—See also advt. p. 54.

Belfone intercommunicator



★ Two-way voice communication system. Two-station and master station types available. Master has rotary type switch selects up to 10 stations. Effortless send-receive switch. Calibrated volume control for local volume. Control on back for adjusting volume of outlying stations. Hand-rubbed walnut cabinet. Bell Sound Systems, Inc., 61 E. Goodale St., Columbus, Ohio.—RADIO TODAY.

Micromatic pick-up



★ Pick-ups for 12-inch and transcription records. Flat above 300, rising characteristic at low end beginning at 300 and gradually increasing to 10 DB at 70 cycles to compensate for attenuation in recording. Type AA74 for 12-inch records—list \$55. Type AA76 for 18-inch transcriptions—list \$75. Audak Co., 500 Fifth Ave., New York, N. Y.—RADIO TODAY.

Spell-O-Light sign



★ Plug-in letters to provide any message or sign desired. Each unit complete in itself with flasher contact. Boxes may be arranged horizontally, vertically, in scattered groups, or suspended. Nothing to wear out. Letter available in several colors—slide into frames of boxes. Heinemann Electric Co., Trenton, N. J.—RADIO TODAY.

Portable recording machine

★ Recording machine for 78 and 33 1/3 rpm. recordings—cuts 90, 110, 130-line records in either direction.



CAN YOU USE \$600 CASH?

ALL YOU HAVE TO DO IS ANSWER A QUESTION. YOU KNOW THE ANSWER NOW—YOU TELL IT TO A CUSTOMER TWO OR THREE TIMES A WEEK. YOUR CHOICE OF EITHER \$600 CASH OR A NEW V-8 SERVICE TRUCK WITH A COMPLETE BUILT-IN SOUND SYSTEM IS THE FIRST PRIZE. THERE ARE 500 OTHER PRIZES!

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

NEW THINGS

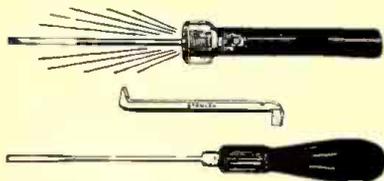
Powered by self-starting synchronous motor. 110 AC, 50 or 60-cycle operation. 16-inch turntable—separate cutting and play back heads. Housed in two cases—easily set up or packed for carrying. Universal Microphone Co., Inglewood, Calif.—**RADIO TODAY**.—See also advt. p. 41. •

Spherical sound cell mike



★ Non-directional type of microphone—sound cell construction—high output of -60 DB. Size 3 inches diameter. Type AR4S39—list \$75. A companion type AR2S6P with slightly lower output is available—has advantage of longer leads as a high impedance mike. Can be supplied with transformer for 50-200 ohm equipment. Brush Development Co., E. 40th & Perkins Ave., Cleveland, Ohio—**RADIO TODAY**.

Stanley radio tools



★ Complete line of hand drills, screw drivers, soldering irons, cold chisels, vises for the serviceman. Illustrated is the 1020 flashlight screw driver, 668 offset screw driver, special 177 long-shank radio screw driver. No. 177 available in 5¼ to 11¼ inch overall lengths. 11¼ size—list \$45. Stanley Rule & Level Works, New Britain, Conn.—**RADIO TODAY**.

Factory-soldered aerials

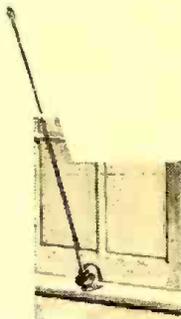
★ Two aerials designed for use in rural sections. Type 45-2428 has a total length of 170 feet of which 150 feet is 2-22 wire and forms flat top and outdoor lead-in. Flexible lead-in window strip and indoor lead-in are soldered on. List \$2.50. Type 45-2431 has 60 feet of 7-strand aerial wire and 30-feet of lead-in. List \$1.60. All parts are soldered together for rapid installation and elimination of noise produced by faulty soldering. Philco Radio & Television Corp., Tloga & C Sts., Philadelphia, Pa.—**RADIO TODAY**.

Diesel electric plant



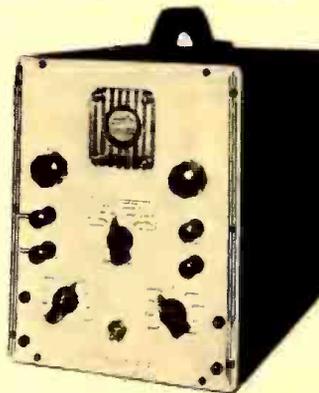
★ Line of 2 to 6 kilowatt Diesel driven AC or DC generators. Extremely low operating cost—consumes 1 pint fuel per horsepower per hour. Will operate continuously with attention only to fuel, water cooling system, and lubrication. Separately excited generator. Moving parts completely enclosed except for flywheel—belt connection between engine and generator. Kato Engineering Co., 727 S. Front St., Mankato, Minn.—**RADIO TODAY**.

Windex antenna



★ Window type antenna which fastens to sill. Telescopic—extends to 8 feet. Moulded insulation and lead-in strip. Plated to resist rust. Model W.I.—list \$2.45. Ward Products Corp., 1523 E. 45th St., Cleveland, Ohio—**RADIO TODAY**.—See also advt. p. 68.

Burton-Rogers oscilloscope



★ Low-cost oscilloscope using 1-inch 913 cathode ray tube. Has vertical amplifier. Sensitivity with amp. 1 RMS volts per inch—without amp. 75 volts per inch. Has 60 cycle sweep only. Amplifier range 20-100M cycles. Input impedance 1 megohm. Model 60—net \$29.95 complete with tubes. Burton-Rogers Co., 755 Boylston St., Boston, Mass.—**RADIO TODAY**.

Crolite ceramic resistors

★ Pig-tail type resistor with Crolite low-loss insulation. Available in 1-watt rating—all usual standard values. Size ¼x¾ inches long. Value of resistor on each unit. Also recently introduced are the Crolite electrolytic condensers which are self-healing. Henry L. Crowley & Co., 1 Central Ave., W. Orange, N. J.—**RADIO TODAY**.

Low-loss radio parts

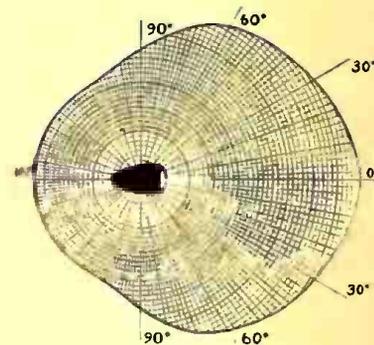
★ Line of Isolantite threaded and grooved coil forms for high-frequency coils. Complete coils and shields also available. Other items are low-loss sockets, plugs, binding posts, and miscellaneous parts. Boonton Radio Corp., Boonton, N. J.—**RADIO TODAY**.

Audio frequency recorder



★ Instrument for automatically recording the over-all audio frequency characteristics of any radio set. Calibrated microphone for sound pick-up—or recorder may be connected to any portion of audio system. Pen draws response on chart calibrated in decibels vs. cycles. Audi-o-graph has self-contained beat frequency oscillator and 1000 KC radio frequency oscillator. Designed for manufacturers and radio labs. Tobe Deutschmann Corp., Canton, Mass.—**RADIO TODAY**.

Dynamic microphone



★ Directional high-output dynamic microphone using Alnico magnets. Pick-up characteristics illustrated above. Exceptionally rugged construction—built-in rubber shock absorbers—blast proof. Durable shock-proof housing. Rigid tests insure quality and dependability of device. Type TR-3—extremely high output level of -43 to -45 DB. Frequency response with 3DB from 20-7000 cycles. List \$24.50. Transducer Corp., 30 Rockefeller Plaza, New York, N. Y.—**RADIO TODAY**.—See also advt. p. 67.

Wrinkle finish varnish

★ Air-drying wrinkle finish varnish for radio shields, chassis, and panels. Requires no baking—easily applied with brush or spray gun. Available in black, brown and green. Black ½ pint—list 35 cents. General Cement Mfg. Co., 611 Lincoln Ave., Rockford, Ill.—**RADIO TODAY**.

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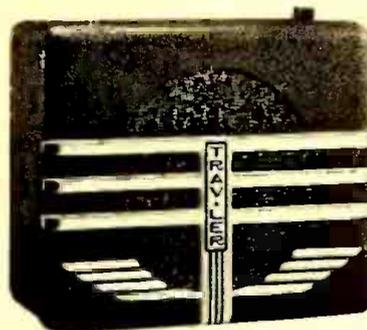
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Special Trav-ler designed high frequency filtering system automatically eliminates all motor and ignition interference.

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Under 1 microvolt
Uses latest type iron core coils.

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For all type 1937, 1936 and 1935 cars.

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Color is metallic gray with chromium plated front grille and red lettering.

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for easy installation of auxiliary overhead or under-dash speaker—if desired.



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601
7 Tubes

TRAV-LER MODEL 601 is a newly designed 7 tubes superheterodyne with single hole mounting for easy installation. The set is equipped with six and one-half inch high fidelity heavy duty curvilinear speaker . . . three gang ball bearing rubber mounted variable condenser. Power Output 4.25 Watts, undistorted. Complete, ready for installation. List Price \$19.95

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Accessory
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Hotel Stevens,
Chicago,
Feb. 13-17.

Room 440,
Hotel Edison,
New York City
Feb. 28-Mar. 5

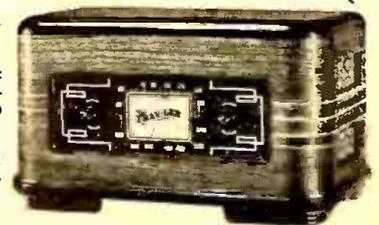
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5 1/2" Dynamic Speaker, Tuning Range 520 KC - 1730 KC.

Two gang ball bearing variable condenser.



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RADIO has made neighbors, good neighbors, of all America—and the world. And the Radio Corporation of America is proud to have played an important part in creating this widespread spirit of fellowship. RCA has done this through the National Broadcasting Company—one of its services—whose two network systems, comprising 116 stations, spread across the United States from Maine to California—from Canada to Texas—across the Pacific to Honolulu.

Broadcasting Headquarters are located in splendid Radio City. Here are NBC's modern, acoustically perfect studios, where many of radio's most famous programs originate. Built specifically for broadcasting, these 22 studios incorporate the latest advances in design, sound-proofing, acoustics and technical facilities. They make possible better program transmission, assuring better home reception.

RCA supplies the world with service in *every* branch of radio. Its varied services have earned unlimited public confidence. The world knows the RCA trademark as a magic key to quality . . . so it buys "RCA ALL THE WAY." And dealers who feature this organization's products do a more profitable business. They know it pays to be associated with Radio's Leader—pioneer in the engineering of sound—pioneer that some day will give the world radio *sight!*

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Model Chassis	I. F. Peak	Model Chassis	I. F. Peak
DE-WALD*			
Continued from January			
RADIO TODAY			
505, 505-F	456	72	115
505-R	456	75	115
505-R-LW	456	80	175
507	456	81	175
508	456	90	175
510, 510-B	456	92	115
511	456	100	456
517, 517-R	456	111	456
520	456	112	456
522	456	119	456
523	456	124	456
525	456	126	456
526	456	128	456
550	456	130	455
551	456	133	175
553, 553-4S	456	139	456
554-S	456	139 C	456
560	456	143	456
570	456	160	456
580-R	456	F	175
600, 600-A	456	S-5	175
601	456	125	456
602	456	1734	456
603-A	456	1734A	456
603-R	456	7114	456
604	456	7124	456
605	175	7127	456
606	175		
607	456		
608	175		
609, 609-SA	456		
610, 610-LW	456		
610-SA	456		
610-SA-LW	456		
610-SC	456		
610-SC-LW	456		
611, 611-LW	456		
611-SA	456		
611-SA-LW	456		
612, 612-LW	456		
612-SA	456		
612-SA-LW	456		
615, 615-LW	456		
616	456		
617	175		
618	456		
619	456		
620, 620-LW	456		
621, 621-LW	456		
622	456		
623	456		
624	456		
626	456		
630	456		
640	175		
735	175		
746	175		
747	175		
800	456		
801	456		
802, 802-C	456		
803	450		
804	456		
805-A, 805-C	456		
805	456		
811-A, 811-R	456		
901, 901-C	456		
902, 902-C	456		
1000	456		
1001	456		
1100	456		
1100 C	456		
1102	456		
1103	456		
A-517	456		
A-605	175		
A-606	175		
A-607-LW	456		
A-617	175		
B-A-G	177.2		
B-A-H	175		
B-A-H-9	175		
B-A-K	465		
B-A-M	465		
B-L-G	115		
K-A-F	175		
ECHOPHONE*			
5	175	23	456-RC
10	175	26	456-RC
12	175	28	456-RC
14	175	30 AW	456-RC
15	175	30 LW	132-RC
16	175	31 AW	456-RC
17	175	31 B	456-RC
18	175	32	456-RC
20	175	32 LW	132-RC
35	175	33 AW	456-RC
36	175	33 LW	132-RC
38	175	34	456-RC
50	175	34 C	456-RC
55	175	34-F 7	456-RC
60	175	35-T 6	172.5-RC
62	115	36	456-RC
65	175	38	456-RC
70	175	38-LW	456-RC

I. F. PEAKS and COLOR CODING

PART IV • RADIO TODAY • FEBRUARY, 1937

Model Chassis	I. F. Peak	Model Chassis	I. F. Peak	Model Chassis	I. F. Peak	Model Chassis	I. F. Peak
EMERSON* (Continued)				EMERSON* (Continued)			
39	456-RC	40-W 6	175-RC	AW-44S	445-RC	E-128	172.5-RC
41	456-RC	42	456-RC	AW-55	445-RC	F	456-RC
44	175	45	456-RC	B	456-RC	F-5	456-RC
45	175	46	456-RC	B-5	456-RC	F-6 D	456-RC
53	175	47	456-RC	B-6	456-RC	F-7	456-RC
53 LW	115	49	456-RC	B-6L	456-RC	F-117	456-RC
55 AW	456	50-L	115-RC	B-8	456-RC	F-122	456-RC
63	175	50	175-RC	B-10	172.5-RC	F-133	456-RC
63 SA-LW	456	50-L	115-RC	B-11	456-RC	F-135	456-RC
63 LW	115	50-M	175-RC	B-131	456-RC	F-141	456-RC
64 LW	115	50-S	465-RC	B-131-LW		G	456-RC
66 AW	456	52-CS	175-RC			G-5	456-RC
ELECTRIC AUTO-LITE				EMERSON* (Continued)			
062A	262	53-JS	175-RC	B-AC-10	175-RC	G-127	456-RC
072 A	262	55-AW	445-RC	BLW	456-RC	H	456-RC
3622	262	55-L	115-RC	C	456-RC	H-5	172.5-RC
3722	262	55-S	175-RC	C-6	456-RC	H-5L	132-RC
ELECTRIC & AUTO. PROD.				EMERSON* (Continued)			
6-AW	456	59	456-RC	C-134	456-RC	H-5 S	172.5-RC
25-AW	456	70-KS	175-RC	C-134-LW		H-130	456-RC
30-AW	456	71	456-RC	C-136	456-RC	H-137	456-RC
35-AW	456	80-KS	175-RC	C-136-LW		J	456-RC
303	456	101	456-RC	C-138	456-RC	J (1930)	175-RC
303-LW	456	101-F 7	456-RC	C-138-LW		J-106	456-RC
303-SW	456	101-U	456-RC	C-138-LW		JS	175-RC
405	456	102-LW	456-RC	C-139	456-RC	K	456-RC
405-LW	456	102	456-RC	C-139-LW		K-5	456-RC
IL-5	125	103	456-RC	C-140	456-RC	K-116	456-RC
IL-5S	125	104	456-RC	C-140-LW		K-121	456-RC
IL-5LW	125	104-LW	456-RC	C-142	456-RC	K-123	456-RC
107 AC	456-RC	105	456-RC	C-142-LW		KS	175-RC
107 LW	456-RC	105-LW	456-RC	C-145-LW		L	456-RC
108	456-RC	106	456-RC	CLW	456-RC	L-7	115-RC
108-LW	456-RC	107	456-RC	CS	175-RC	L-117	456-RC
109	456-RC	107-AC	456-RC	D	456-RC	L-117-LW	
109-LW	456-RC	107 LW	456-RC	D-134-LW		L-122	456-RC
110	456-RC	108	456-RC	D-136-LW		L-122-LW	
110-LW	456-RC	109	456-RC	D-138-LW		L-133	456-RC
111	456-RC	109-LW	456-RC	D-138-LW		L-133-LW	
111-LW	456-RC	110	456-RC	D-139	456-RC	L-135-LW	
112	456-RC	110-LW	456-RC	D-139-LW		L-135	456-RC
113	456-RC	111	456-RC	D-140	456-RC	L-141	456-RC
114	456-RC	111-LW	456-RC	D-140-LW	456-RC	L-141-LW	
115	456-RC	112	456-RC	D-142	456-RC	L-143	456-RC
116	456-RC	113	456-RC	D-142-LW		L-143-LW	
117-LW	456-RC	114	456-RC	D-146-LW		L-144	456-RC
119	456-RC	115	456-RC	D-AC-5	456-RC	L-144-LW	
126-LW	132-RC	116	456-RC	DLW	456-RC	L-755	456-RC
126-LW	132-RC	117-LW	456-RC	D-55	456-RC	LA	172.5-RC
250 AW	456-RC	119	456-RC	D-55	456-RC	M	456-RC
250-LW	132-RC	250 AW	456-RC	D-134-LW		M-134	456-RC
280	456-RC	250-LW	132-RC	D-142	456-RC	M-136	456-RC
300	172.5-RC	300	172.5-RC	D-146-LW		M-138	456-RC
321-AW	456-RC	321-AW	456-RC	D-146-LW		M-139	456-RC
321-LW	132-RC	321-LW	132-RC	D-AC-5	456-RC	M-140	456-RC
350-AW	456-RC	350-AW	456-RC	DLW	456-RC	M-142	456-RC
350-LW	132-RC	350-LW	132-RC	D-5	456-RC	M-146	456-RC
375(UV-5)		375(UV-5)		E-5	456-RC	M-755	175-RC
375(W-6)	175-RC	375(W-6)	175-RC			M-AC-7	175-RC
375-LW	125-RC	375-LW	125-RC			P	456-RC
450	456-RC	450	456-RC				
667	172.5-RC	667	172.5-RC				
678	172.5-RC	678	172.5-RC				
755-L	115-RC	755-L	115-RC				
755-M	175-RC	755-M	175-RC				
755-S	465-RC	755-S	465-RC				
770	456-RC	770	456-RC				
775-L	115-RC	775-L	115-RC				
775-M	175-RC	775-M	175-RC				
775-S	465-RC	775-S	465-RC				
965	172.5-RC	965	172.5-RC				
A	456-RC	A	456-RC				
AA	172.5-RC	AA	172.5-RC				
A-7	456-RC	A-7	456-RC				
A-8	456-RC	A-8	456-RC				
A-11	456-RC	A-11	456-RC				
A-130	456-RC	A-130	456-RC				
A-132	456-RC	A-132	456-RC				

C—Condensers
R.M.A. color coded

R—Resistors
R.M.A. color coded

#—R.M.A. color coding
used throughout the set

Model Chassis	I. F. Peak	Model Chassis	I. F. Peak
ERLA* SENTINEL* (Continued)			
25A72	465-RC	1060	465-RC
25A74	465-RC	4300	465-RC
31B	465-RC	4400	370
31B72	465-RC	4500	465
31B74	465-RC	5000	465-RC
32E	465-RC	5100	465-RC
32E69	465-RC	5211	465-RC
33E	465-RC	5500	370-RC
33E70	465-RC	5600	465-RC
33E71	465-RC	5628	465-RC
34E	465-RC	5700	465-RC
34E71	465-RC	5721	465-RC
34E73	465-RC	5850	465-RC
35E	465-RC	6000	265
35E70	465-RC	6100	465-RC
35E72	465-RC	6001	465-RC
36L	465-RC	6102	465-RC
36L71	465-RC	6200	465-RC
36L73	465-RC	6232	465-RC
37B	465-RC	6234	465-RC
38B	465-RC	6241	465-RC
39B	465-RC	6300	465-RC
40A	465-RC	6313	465-RC
41A	465-RC	6315	465-RC
46A	465-RC	6317	465-RC
48A	465-RC	6321	

Sylvania can take you **OVER THE TOP!..**



Sell Sylvania and Watch Your Profits Hit a New High!

● Is your tube business going over the top with a bang? Are you getting your share of the repeat business, the pleased customers and the profits that go to the dealer who sells Sylvania?

Ask the man who profits with

Sylvania...he'll tell you how it's done. No kick-backs...because Sylvania tubes have gone through *eighty separate tests* for your protection. Fair list prices and the kind of technical and sales helps that are designed to make better business for you! It pays to sell

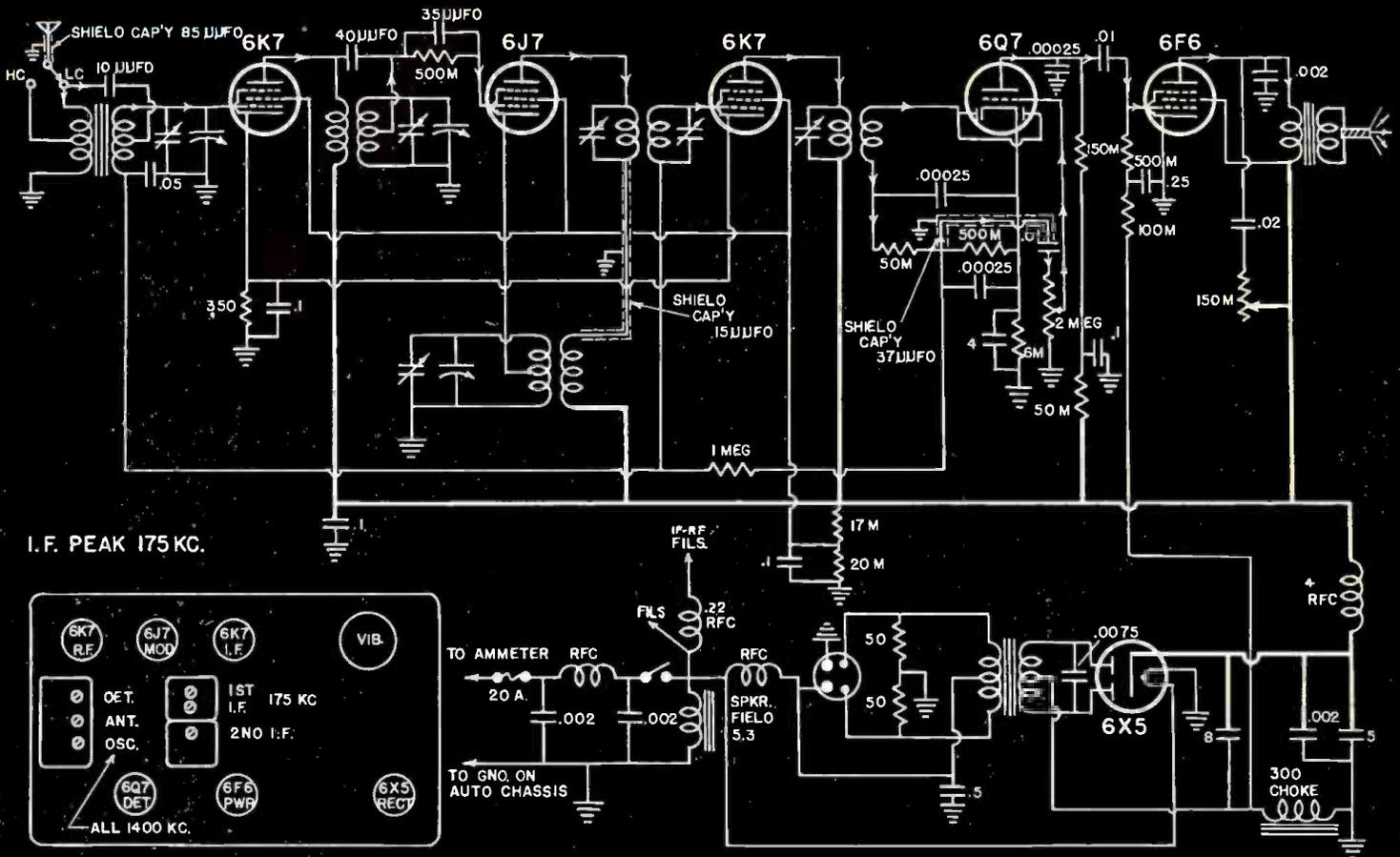
Sylvania...because Sylvania plays ball with you every inch of the way!

You owe it to yourself and your business to find out about Sylvania NOW! For complete sales and technical information write to the Hygrade Sylvania Corporation, Emporium, Pa.

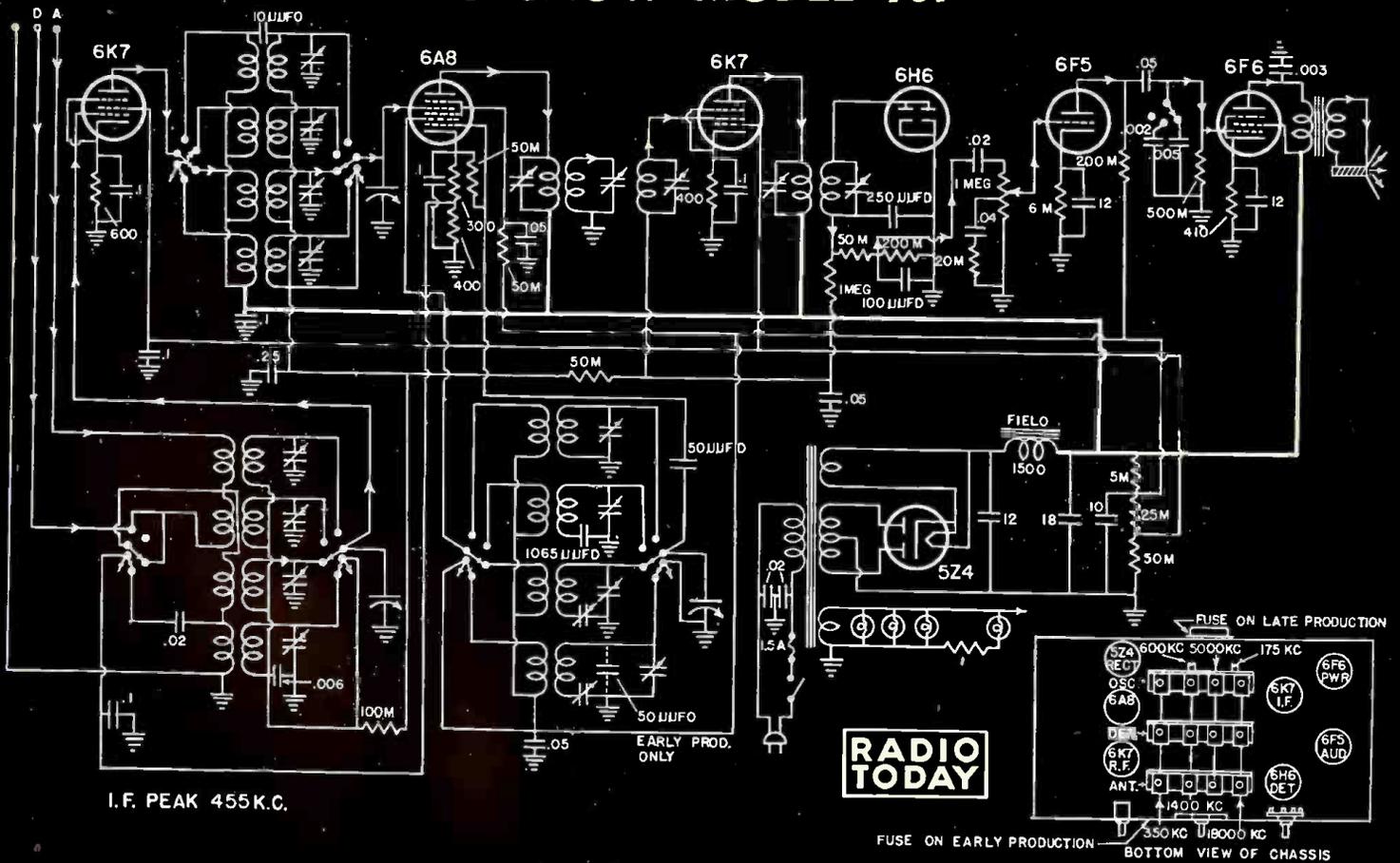
SYLVANIA

THE SET-TESTED RADIO TUBE

GENERAL ELECTRIC MODEL N-60



GRUNOW MODEL 761



SERVICE NOTES

GENERAL ELECTRIC N-60 AUTO RADIO

★ G-E's 1936 auto radio is a 6-tube superhet using a non-synchronous vibrator power supply and a 6J7 1st detector-oscillator.

A grid-leak type 1st detector is employed and is connected across only part of the RF coil, and not across the condenser gang. The antenna coil is tapped for *hi* and *lo* capacity antenna systems.

The 6F6 output tube obtains its bias from the voltage drop across the filter choke. RF chokes are used in numerous positions to filter out noises.

Alignment of the oscillator takes place at 1650 KC with the condenser gang set at minimum capacity (1650 KC, not 1400 as shown on the schematic). The RF stage is aligned at 1400 KC, while the antenna stage is adjusted after installation. When the antenna has been connected, adjust the antenna trimmer by tuning to some weak station between 1400 and 1200 KC.

The intermediate frequency is 175 KC.

The 6K7 and 6J7 filaments are fed through a filament RF choke, while the 6Q7 and 6F6 are connected immediately after the on-off switch. Circuit is quite conventional—arrow heads indicate path of the signal through the set.

GRUNOW MODEL 761 CHASSIS 7-C

★ Model 761 by Grunow is a 4-band set with RF amplifier on all bands. Circuit is quite conventional and utilizes metal tubes.

A triple tuned I.F. transformer is employed between the modulator and 1st I.F. amplifier. All the I.F. trimmers are adjusted at 455 KC for maximum output.

Signal circuit trimmers are adjusted at frequencies indicated upon chassis layout in usual manner. On the schematic the highest frequency coil is on top, and weather band coil on the bottom of each group. Shorting type coil switches are used.

The antenna coil primary circuit is a little unusual. When a doublet is connected to the D and A posts, it is used as a doublet only on the short wave-bands. The switch does the proper selecting.

LOCATING INTERMITTENTS

★ Radio Manufacturers Service members are making important use of new Philco devices and methods for locating and identifying intermittent connections.

It is an old story that when sets have been tested and pronounced O.K. the customer returns with the complaint that reception is no better than before and the serviceman then takes the blame. What happens in nine of

such cases out of ten is that an intermittent contact does not show up readily and that it comes and goes with expansion and contraction of the receiver.

Within the last few months Philco has lined up a number of suggestions for meeting this problem. Among the remedies is the shaker table, used in the service department, for checking sets against intermittents. This tester, which can be made of odds and ends around the shop, will prove particularly valuable in the larger service establishments where a number of sets are being serviced every day.

The rubber mallet is another.

The Delicate Balance of "High-Fi" Sets

Easily Adjusted
with

Model 1200-C VOLT-OHM- MILLIAMMETER

MODEL
1200-C



DEALER
PRICE
\$24.33

- ★ 5000 Ohms per Volt D.C.
- ★ Resistance Readings to 7.5 Megohms.
- ★ For all Radio Measurements not Requiring a No Current Draw Vacuum Tube Voltmeter.

The delicate balance of high fidelity sets requires servicing instruments capable of measuring high resistance and all voltages accurately.

Model 1200-C Volt-Ohm-Milliammeter has self-contained power for readings to 7.5 Megohms. The D.C. voltage readings are at 5000 ohms per volt enabling you to read accurately the voltages of low power.

Has two separate instruments, A.C. and D.C., in twin case. Ohms Scales separately adjusted.

Scale Reads: A.C. and D.C. 10-50-250-500-1000 Volts, the D.C. is at 5000 Ohms per volt; 250 Microamperes; 1-10-50-250 Milliamperes; ½ to 500 Ohms, 1500 Ohms, 1.5 and 7.5 Megohms.

A TRIPLETT MASTER UNIT

See Your Jobber

Write for Catalog

SEND COUPON NOW



The Triplett Electrical Instrument Co.
192 Harmon Avenue, Bluffton, Ohio
Without obligation please send me more information on Model 1200-C; Complete Triplett Master Unit Line.

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



➔ **SPOTLIGHT
KEN-RAD PRODUCTS**

They hold the center of the stage for quality manufacture, dependable performance and profit return. They merit applause in the way of repeat business. Ken-Rad gets an encore every time. Find out more about these dependable performers. Write us for information.

Ken-Rad

KEN-RAD TUBE & LAMP CORPORATION, INC.
OWENSBORO, KY.

SERVICE NOTES

Through its application, contacts can be caused to be opened or closed semi-permanently on striking.

In those cases where intermittents do not show up until the chassis has become thoroughly heated, an ordinary reflector-type electric heater can be directed at the under side of the chassis and the set then turned on and allowed to play for a few minutes.

Sometimes low-resistance AC relays connected in the voice-coil circuit of the set can obtain clues to the trouble. When the intermittent connection makes or breaks, as the case might be, the relay opens and thus closes a switch that will ring a buzzer or bell to notify the serviceman that the set is no longer operating.

DECIBEL GAIN & WHAT IT MEANS

The usual method of measuring the gain of an amplifier is to apply an AC voltage across a resistor in the grid circuit of the first tube and to measure the voltage developed across a non-inductive load resistor in the output circuit. The decibel gain of the amplifier based on the formula:

$$DB. \text{ gain} = 10 \log_{10} \frac{\text{Output Watts}}{\text{Input Watts}}$$

becomes

$$10 \log_{10} \frac{(\text{Output volts})^2 \times \text{input resistance}}{(\text{Input volts})^2 \times \text{output resistance}}$$

From this equation it will be seen that the voltage gain of the amplifier increases in direct proportion to any increase in input resistance if the input voltage remains constant.

Most manufacturers of crystal microphones rate the output at -70 DB. referred to the usual 6 milliwatt zero level when operated into a 5 megohm resistance load. On this basis, it would appear that an amplifier designed to operate from a crystal microphone and to have a power output of 18 watts (34.9 DB.) should have an over-all gain of 70 plus 34.9 or 104.9 DB.

By trial, however, it will be found that such an amplifier does not have sufficient gain. The reason is apparent on careful analysis. In operation, the grid resistor is actually shunted by the crystal microphone, whose average impedance is in the neighborhood of 100,000 ohms. Hence the input resistance of the amplifier would also be approximately this same value. In computing the gain with 100,000 ohms grid resistance, the input power is 50 times what it would be with a 5 megohm grid resistance, and the DB. gain correspondingly lower.

(Service section continued on page 55)

THEY SEE IT! THEY BUY IT!

That's why

RADIOBAR
WITH
PHILCO
OFFERS YOU Year-Round "PLUS" PROFITS



90 UP

"Look . . . it's Radiobar!" "Isn't it the most beautiful piece of furniture you've ever seen?" "How practical—what a space-saver—Dad, let's BUY a Radiobar!"

Mr. Radio Dealer, listen! America is talking about the biggest, handsomest "eye-arrester" in the business. Wherever there is a Radiobar in a window, you find customers milling up, enthusiastic comment, more store traffic.

Make your store-frontage do double-duty, now. Have the most magnetic window on the street! A Radiobar can do it—for Radiobar is a "sight-seller" 12 months a year!

FREE! Handsome new attention-compelling displays for floor and windows. Banners, counter cards, backgrounds—everything you need for a selling job!

RADIOBAR
CO. of AMERICA
60 WARREN STREET
NEW YORK CITY
7100 MCKINLEY AVENUE
LOS ANGELES, CALIF.

Mail today to nearest office—Dept. RT237
RADIOBAR CO. OF AMERICA
60 Warren Street, N. Y. C. or
7100 McKinley Avenue, Los Angeles
Please send me complete information about FREE
Radiobar displays Please rush complete
Radiobar story to me

Name
Address
City State

UNIVERSAL PORTABLE Recording Machine

A precision machined, compact outfit that positively eliminates all waver—Records in either direction at 33½ or 78 rpm.—90, 110 or 130 lines per inch—110 volt AC 100% synchronous motor—Solid 16 in. turntable—Constant speed rim belt drive—Reinforced black leatherette carrying cases—unequaled value—Superlative performance—Also stationary machines, amplifiers, cutting heads, special acetate pickup, etc.



UNIVERSAL MICROPHONE CO., Ltd.
424 WARREN LANE INGLEWOOD, CALIF., U.S.A.

PHENOMENAL Sales OF THE NEW LOW PRICED



PRESTO RECORDER

... reveal widespread demand for a good low priced instrument.

Offered to dealers only three months ago ... the Presto Model D Recorder now rates center position in dealers' window and floor display ... the spot reserved exclusively for profitable, fast moving merchandise.

SALES RECORDS SHOW

... that every school, college, radio station, orchestra leader, church and civic organization is a live prospect for the recorder.

... that there is good money in making records for musicians, radio artists, public speakers, stores, hotels and industrial organizations.

Get the best of this business in your section!

WRITE NOW for dealer proposition and tested sales promotion data.

NOTE: The model shown makes phonograph records equal to any commercial record in brilliant, life-like reproduction of voice and music. It plays any record, up to 12", and also operates as a public address system.

WORLD'S LARGEST MANUFACTURERS OF INSTANTANEOUS RECORDING EQUIPMENT

PRESTO

RECORDING CORPORATION

137 West 19th Street, New York, N. Y.

SAVING ON INCOME TAXES

(From page 12)

tion it is to the tax-payer's advantage to time his sales and select the property to be sold so that his capital losses in any one year do not exceed his capital gains by more than \$2,000.

As an alternative to high earnings many business men and corporations take advantage of expenses such as advertising and research, which while chargeable as expenses for the current year, when taxes are high, have the effect of increasing future values in the years when lower tax rates may be expected. Advertising and research outlays thus become advantageous ways of absorbing extra corporation profits.

Inventories may be valued at either (1) "cost" or (2) "cost or market whichever is lower." Tax-payers were allowed to select the basis preferred when the law was passed in 1920, but are required to adhere to the selection made, unless special permission is secured. A new business may adopt either method on the first return. Method No. 2 has the result of minimizing taxes for the present year.

Reserves for bad debts may be charged off specifically, or allowances of a reasonable proportion may be set up, but once having accepted either plan, the tax-payer is thereafter bound to follow it. A new organization may make its choice on the initial return.

PROFITS FROM RECORDERS

(From page 18)

Dealers who face the necessity of building recording rooms or studios in their stores will find the manufacturers' engineers ready to assist. Time payments are also available to dealers who want to wait for the extra profit involved.

In New York City alone there are 10 manufacturers who are active in making and promoting recorders and accessories. These are Allied Recording Co.; Dencose, Inc.; Electrical Laboratories, Inc.; Fairchild Aerial Camera Corp. (Woodside, Long Island); Fidelitone Records; Miles Reproducer Co.; Mirror Record Corp.; Piezoelectric Laboratories (New Dorp, Staten Island); Presto Recording Corp., Sound Apparatus Co. and Speak-O-Phone.

In Hollywood, Cal., are the Electronic Sound Laboratories, Radiotone Recording Equipment Co., and the Recording Equipment Mfg. Co. Elsewhere in California are the Remler Co., San Francisco, and the Universal

Microphone Co., Inglewood. In New Jersey are Rangertone, Inc., Newark, and RCA Mfg. Co., Camden.

MORE MONEY IN PARTS

(From page 25)

the way of *complete stocks*. Service in the way of *frequent and prompt deliveries*. Service in the form of competent *technical assistance*. Service in the way of *competent merchandising assistance*. All these things, combined with some judicious selling on the part of the jobber's salesman, makes for a *permanent customer*.

"A permanent customer can be induced to order at least \$5 worth of merchandise at a time. A permanent customer can be sold on the idea of buying a quality product at a reasonable price, rather than falling for every cut-priced inducement that comes along. A permanent customer can be sold the nationally known product the jobber handles, rather than insisting on some particular brand of merchandise that the jobber does not carry and in that way forcing the jobber to either duplicate his lines or lose the business.

"We know one jobber who is working 100 per cent along these lines. He is located in a comparatively quiet neighborhood of a big city. He has plenty of typical big-city competition. Yet this jobber carries only one line of each of the types of merchandise he handles. He delivers, any time, anywhere, *provided the order exceeds \$10*. He sells at regular discount only. **UNLESS THE ORDER IS LESS THAN \$5**, in which case the discount is reduced. He is never out of anything, and his salesman call on his trade regularly. That jobber in 1936 sold over \$100,000 worth of radio parts *exclusive of tubes*, and we'll leave it to your judgment as to whether he made a profit.

"It is only a question of time before those jobbers who refuse to recognize the fact that radio parts jobbing is a legitimate business and must be conducted along legitimate business lines in order to survive, are going to be forced out of the picture. In the meantime those jobbers who have established themselves firmly on a sound basis are going to profit, now and in the future. The parts manufacturer is only too willing to cooperate with the jobber to achieve this condition. Why not take stock of your own conditions now and see if you cannot work out something along lines similar to those suggested, to fit your own business," comments Mr. Karet in conclusion, adding: "We feel sure the results will be well worth it."



**NOW ON THE
5th MILLION**

**FRIGIDAIRE SHATTERS ALL RECORDS
AND PUTS ON *MORE SPEED* FOR 1937!**

Over 4,000,000 Frigidaires Sold... 500,000 in 1936 Alone

...and you'll do **STILL BETTER** with Frigidaire in 1937—**BECAUSE**, **1.** You'll have a Sensational New Product—designed from top to bottom with startling new features—including one that will instantly capture the imagination of the buying public, and start dealers talking from coast to coast! **2.** You'll have an unbeatable New Selling Strategy! **3.** You'll have Millions More Advertising Messages working for you—every one packed with new selling power... more dramatic, more appealing, more action-compelling than ever! With this potent program, Frigidaire is putting on **MORE SPEED** for 1937. And Frigidaire Dealers are preparing for another, an even greater, record-shattering year!

FRIGIDAIRE DIVISION • GENERAL MOTORS SALES CORPORATION • DAYTON, OHIO

YOU'LL DO STILL BETTER WITH FRIGIDAIRE IN '37!

NEIGHBORHOOD SHOP PLUGS APPLIANCES

Colony Radio tells "How to sell the neighbors on your store."

★ "We thought the neighborhood was not as well acquainted with us as it might be, particularly since a lot of new homes were being built in the vicinity," explained Henry E. Marschalk of the Colony Radio Company in Washington, D. C. "So we decided to get out a series of three circular letters telling them all about ourselves and where we are located.

"We sent these letters out four days apart and they paved the way very nicely for a house-to-house canvass which was our next move in 'stepping up' the sales to the neighbors. And why not intensively cultivate your neighborhood business? A service call in your immediate neighborhood costs much less and puts more money into your pocket than one several miles away.

"These letters opened the door wide to our house-to-house salesmen. Prior to that it was a very cold canvass. After receiving our letters, people sort of felt that they knew us and were more friendly. And just as soon as we got through the mailing of the letters (staggered 200 at a time), we

started on the canvass before they got cold.

"We concentrated on radio sales, but also covered electric refrigerators, washers and ironers. We have three men out on these appliances, but we are also pushing electric ironers and are putting on two more men. We employ from three to five men in our repair department.

"In our letters we pounded on the fact that Colony Radio is a neighborhood store which can render better, faster service until as late as ten o'clock at night. We told them about our large stock of radios and about our radio service. We featured time payment and budget accounts. We invited them to come to the store in the evening and look over our selection of more than a hundred different kinds of radios. In our third letter we stressed the electric washer. These letters read in part:

I

NO SYMPATHY, PLEASE!

The plea of local merchants to "patronize your neighborhood store" often seems based on a desire for sympathy for the little fellow. But we believe

that most people do not buy out of sympathy. They buy because they can get what they want at prices as low or lower than elsewhere.

Colony Radio is a "neighborhood" store only because it is located near your home . . . for better, faster service to you, even until 10:00 o'clock at night.

Unlike most "neighborhood" stores, Colony Radio now stocks more than one hundred radios in a complete range of sizes, styles and prices . . . a selection hardly equalled anywhere. Prices are the same as any other reputable concerns.

In its ten years of steady, solid growth, Colony Radio has found, too, that the public appreciates good service on their radios. That is why Colony's Service Department today is unequalled in Washington. That is why Colony advertises "Where Service Backs Up Every Sale."

You will profit when you buy your new radio at our store.

II

To Our Neighbors, Friends and Customers:

In our introductory letter to you the other day, we stressed the point that our store always is well stocked; that we now offer more than one hundred radios for your careful selection. This alone makes Colony Radio an exceptional store.

In addition we are right in your neighborhood, which makes a night call easy. You can come down here at your leisure after dinner and look over our line without obligation to buy. A service call can be answered in ten minutes or less, because we are in your immediate neighborhood.

With the air chockfull of the most interesting programs in years and with today's radios so much better than sets four or five years old, you owe it to yourself and your family to turn in that old radio for a brand new one. Dials which are so very easy to read, perfected automatic volume control, more graceful and modern cabinets . . . all contribute so much to the enjoyment of your modern radio.

Why not come to the store this evening and make your selection? Beautiful de luxe console radios in * * * may be bought for as little as \$5.00 a month . . . less than \$1.25 a week! Or, if you prefer, telephone Col. 0067, and we shall be glad to arrange a demonstration in your home.

III

To Our Neighbors, Friends and Customers:

In our other two letters to you we stressed both good radio service and our well-balanced stock of more than one hundred new radios. But we had no intention of overlooking the other merchandise that we sell.

Our outstanding product is the * * washing machine . . . sturdy, simple to use, faster, and does better wash-

FIRST REFRIGERATOR EVER TO BE EQUIPPED WITH A RADIO SET



BUILT-IN radio on a new Crosley Shelvador is shown in Texas by Hymen Reader, Houston distributor, pictured here with a hand on the dial.

ing than can be done by any other means. Also your ** always is available for washing the little extra things that need cleansing between regular washings. In addition, you may wash the small bathroom rugs, the blankets and the lace curtains for which you would have to pay a lot extra at a laundry.

At our store, you may purchase a ** for as little as \$4.50 a month. Compare this with your present laundry costs, in damaged and lost clothes, plus the laundry bill.

It would be a pleasure to demonstrate a ** in your home (no obligation, of course) if you will just telephone us, Co. 0067. Why not do it now?

Frigidaire super-duty boxes



Red-blooded and flourishing organization of dealers in Brooklyn, N. Y., is discovered in another spotlight. Years old and definitely on its feet, this Electrical Appliance Dealers Ass'n, Inc., felt a surge of sympathy for dealers in the flood areas whose sales floors were lately under water. At a recent meeting the membership arose and in a few minutes shelled out \$109 for a relief fund. Association treasury matched this amount, so that a neat total of \$218 was ready for the local Red Cross.

★ Line for 1937 consists of 5 master, 4 de luxe and 1 imperial models. Storage capacities range from 4.1 cu. ft. to 13.5, with shelf areas varying from 8.9 sq. ft. to 29.5. Features are lifetime porcelain, instant cube-release, automatic tray release, 9-way adjustable interior, portable utility shelf, sliding hydrators, food-safety indicator, and additional items. Illustrated herewith is de luxe 7-37, with 7.2 cu. ft. capacity. Frigidaire Division, General Motors Sales Corp., Dayton, Ohio.—**RADIO TODAY**.—See also advt. p. 43.

Norge Rollator refrigerators



★ Included in 1937 line for Norge are 2 low-temp models, 5 de luxe, and 3 standard. Capacities vary from 4.25 cu. ft. to 12.25, with shelf areas ranging from 9.06 sq. ft. to 17.10. Two de luxe models are available in mother-of-pearl, green or tan exterior finish. Features include redesigned evaporator door and hydrovoir, ice tray release, adjustable insert shelf, bottle rack, sliding utility basket, etc. Pictured here is low-temp model 81-37; capacity 8.08 cu. ft. Norge Division, Borg-Warner Corp., Detroit, Mich.—**RADIO TODAY**.

BEST SELLING RECORDS AS WE GO TO PRESS

BLUEBIRD

This Year's Kisses. The Girl on the Police Gazette. Both with Shep Fields and his Rippling Rhythm—B6757.

Serenade in the Night. Little Old Lady. Both with Shep Fields and his Rippling Rhythm—B6747.

Goodnight My Love. One Never Knows—Does One? Both with Shep Fields and his Rippling Rhythm—B6685.

BRUNSWICK

That's Life I Guess. Pennies From Heaven. Both with VC by Billie Holiday, both with Teddy Wilson and his orchestra—7789.

Serenade in the Night—waltz. VC by Russ Brown. Dear Diary. VC by Lew Palmer. Both with Jan Garber and his orchestra—7804.

I've Got You Under My Skin. VC by Skinny Ennis. Easy To Love. VC by Bob Allen. Both with Hal Kemp and his orchestra—7745.

COLUMBIA

Serenade in the Night—tango. Me and the Moon. Both with vocal refrain, both with Mantovani and his Tipica orchestra—3159D.

Mr. Ghost Goes to Town. Algiers Stomp—stomp. Both by Mills Blue Rhythm Band under direction of Lucky Mil-linder—3158D.

Callin' Your Bluff—stomp. Big John's Special. Both with Mills Blue Rhythm Band—3162D.

DECCA (By titles)

Pennies From Heaven. Bing Crosby—947. Jimmy Dorsey and his orchestra—951.

Goodnight My Love. Ruth Etting—1107. Mal Hallet and his orchestra—1047.

When My Dream Boat Comes Home. Al Donahue and his orchestra—982.

VICTOR

Never Should Have Told You. You Can Tell She Comes From Dixie. Both with

Benny Goodman and his orchestra—25500.

This Year's Kisses. He Ain't Got Rhythm. Both with Benny Goodman and his orchestra—25505.

Who's Afraid of Love. One in a Million. Both with "Fats" Waller and his Rhythm—25499.

NEW LOW COST INTERCOMMUNICATORS APPEAL TO AVERAGE PROSPECTS



TWO-WAY communication via Philco-Phone, selling to office, home, factory.

LOOK BEHIND THIS NAMEPLATE



You'll get a
new idea of refrigerator salability
when you see the 1937
Fairbanks-Morse Conservador



1 is—The CONSERVADOR, an inner door and separate food compartment. 2 is—The new Self-Sealing Crisper. 3 is—The new Sliding Fruit Basket. All three of these features, combined, permit removing two-fifths of all food stored in the cabinet without opening the main food compartment to the warm outside air. 4 is—The new, extra Vegetable or Beverage Compartment. Notice the new, different outer door with a flat double-sealed inside surface and insulation on the outer side. Let us show you these, and the many, many other features that will spell sales for Fairbanks-Morse dealers in 1937.

TALK about convenience! Talk about economy! Talk about heat-wave-proof protection to food! Name anything you think a refrigerator should have and should do to clinch sales. The Fairbanks-Morse Conservador Refrigerator for 1937 *has it* and will *do it!* Behind that nameplate are the greatest improvements in modern home refrigeration. The patented, exclusive CONSERVADOR. New twin-sealed door with insulation on the outer side. Simplified temperature control. Automatic overload protector that resets itself. Self-sealing crisper for vegetables. Sliding fruit drawer. Utility storage compartment. New low cost of operation that you can prove, not in kilowatts, not by obscure comparison, but in *pennies*, right on your sales room floor.

FREE FLOOR PLAN

For a limited time only—A Free Floor Plan on your initial order. This, plus a limited recourse finance plan at no cost to the dealer, means that you can cash in on the early buying market. Your distributor has the details

DIFFERENCES THEY CAN SEE — YOU CAN SELL!

Fairbanks-Morse dealers have a refrigerator line for 1937 that is modern — different. Replete with selling features that are easy to see — easy to demonstrate — that take this new line out of the field of comparative sameness — that will clinch sales where small differences would fail. Why not see if you can get this greater profit line? There may be a franchise available in your territory. Write or wire for the name of your Fairbanks-Morse distributor. Fairbanks, Morse & Co., Home Appliance Division, 2060 Northwestern Avenue, Indianapolis, Indiana. Other Fairbanks-Morse products: Washing Machines, Ironers, Radios, Automatic Coal Burnes.

F A I R B A N K S - M O R S E
Conservador Refrigerator

ON THE TRADE TICKER

★ Shure Bros., Chicago manufacturers of mikes and acoustic devices, have recently been licensed by Brush Development Co. for the making of piezo-electric record reproducers. Shure company is busy with the development and manufacture of Rochelle salt crystal devices now being licensed for mikes, vibration pickups and record reproducers under the Brush patents.

★ All district sales representatives of the Ken-Rad Tube & Lamp Corp. met recently at the firm's headquarters at Owensboro, Ky. Execs on the program were C. J. Hollatz, vice-president and general manager; "Bud" Mathews, sales manager; and A. O. Perlitz, sales promotion manager. Guests heard brand new sales plans for 1937.

★ At a recent meeting of The Representatives, two new members were added to the fast growing roster; Robert M. Campion, Dallas, Tex., and E. C. Edwards, Cleveland, O., both of whom are veterans in the radio industry.

★ Fort Wayne, Ind., chapter of the Institute of Radio Service Men recently elected officers as follows: chairman, Robert Stone; vice-chairman, Harold Ramm; secretary treasurer, Edward Moennig. Committee chairmen appointed were Henry Schryver, Fred Pembleton, Marcellus Miller and T. R. Eiler.

★ Emerson Radio & Phonograph Corp. staged its first annual get-together dinner and entertainment for the Metropolitan dealer organization of New York on Jan. 25 with nearly



J. P. KENNEDY, lately appointed advertising and sales manager for Triumph Mfg. Co., Chicago.

750 dealers present. Toastmaster was Nate Hast, eastern sales manager for Emerson. Execs of the firm were introduced, climaxed by the appearance of Ben Abrams, president, who announced the formation of a new Emerson organization in the area called Emerson-New York, Inc. Mr. Abrams' brother, Louis, will head the new company. Mr. Hast then presented the Spring 1937 line of home and auto sets, including a total of 8 new receivers. Featured also were Emerson's new display fixtures, the "silent salesman."

Similar affair was held in Newark, N. J., at which was announced the formation of the distributing corporation, Emerson-New Jersey, a company dedicated to servicing of dealers in northern New Jersey.

★ Chas. A. Verschoor, president of International Radio Corp., has announced further boosting of production schedules to meet the dealer demands for the new Kadette auto-dial Model 35. Report is that the introduction of the table model with a telephone-type dial created a coast-to-coast stir.

★ Executives of the Tung-Sol Lamp Works, radio tube division, Newark, N. J., hope that with the company's new factory now in full operation, delayed shipments during peak months will be eliminated. Tung-Sol consignment selling plan to dealers who can qualify will be continued.

★ Opening of new radio (exclusively) distributing branch in New Jersey was occasion of gala General Electric meeting at Newark's Essex House, January 21st. Walter T. Ferry will be in charge of new set-up under D. W. May, district radio sales manager.

Speakers of the evening were E. H. Vogel, G-E's radio manager (Bridgeport) who reviewed Co.'s accomplishments and "the thinking of a great firm."

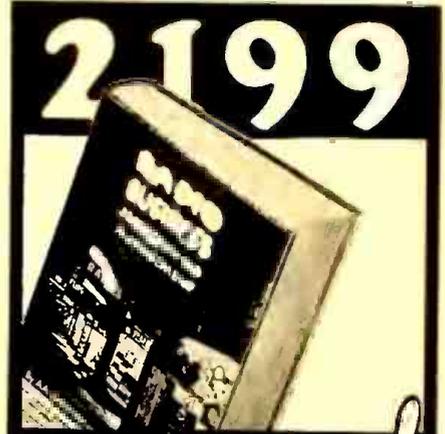
Doc W. R. G. Baker, Chief Engineer, Bridgeport, pointed out that maintainance of leadership was "tied back to the research activities of a company"—and that G-E was one of the few having research labs.

D. W. May explained policies of G-E which were enthusiastically received by the 750 dealer-guests and announced a new "trade-in" model receiver with long discounts. Others present were Bill Saunders, Philly radio sales mgr.; John Abrams, local credit mgr.; Bill Harrison, Newark's G-E distrib.; Lee Williams, district mgr. of G-E Supply Corp.; R. M. Hoey, Bridgeport office; Earl Foreman and Sam Hammer, N Y. office.

★ New York office of the Hytron Corp., under the direction of D. H. Cohen, has moved to larger quarters at 315 Fourth Ave., N. Y. C.

★ As Galvin Mfg. Co.'s new plant takes shape at 4545 Augusta Blvd., Chicago, the trade discovers that the building will be ultra-modern in design, following lines inspired by better buildings at the Chicago World's Fair. First floor occupies about one city block; plant will be the new home of Motorola home as well as auto sets after April 1.

★ Expansion plans of Detrola Radio & Television Corp., Detroit, include a recent move into new location at Beard and Chatfield Aves. Move will give the firm nearly 4 times its former floor space, will provide room for branching out into new manufacturing branches, according to John J. Ross, Detrola president.



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- Power handling capacity 15 Watts
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Thoroughly adaptable for indoor or outdoor use. We know this reproducer will please you.

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Ask for the name of our nearest distributor. Wright-DeCoster distributors are always anxious to cooperate.

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TRADE FLASHES

★ Clarence A. Earl, formerly president of Earl Radio Co., and vice-president of Willys-Overland, Inc., has been elected president of the Arcturus Radio Tube Co., Newark, N. J. The company will announce shortly the addition of several new lines allied to the radio-tube business.

★ Charles S. Halpern, president of the Halson Radio Mfg. Co., New York, N. Y., announced this week the appointment of Lewis E. Dorfman as sales manager of the company. One of the real old-timers of the radio industry, Mr. Dorfman has a coast-to-coast acquaintance and friendship among jobbers and dealers that makes him a very valuable addition to the fast-growing Halson organization. Within a few weeks Charlie and Phil Halpern, vice-president of the company, will have several interesting announcements to make regarding 1937 merchandising and manufacturing expansion plans.

★ An increase of approximately 25 per cent in manufacturing space, with resultant increase in the production of IRC insulated metallized resistors, metallized volume-controls, and precision and heavy-duty wire-wound resistors has been made by the International Resistance Co., 401 N. Broad Street, Philadelphia, Penna. All production space and executive offices are still on one floor, a block long, in the spacious Terminal Commerce Building, into which IRC moved about one year ago, with a substantial increase in productive space. Even this new space became inadequate, and the present addition was necessitated. Both President Ernest Searing and General Manager Fred D. Williams are optimistic regarding the outlook for 1937.

★ Wincharger Corporation, Sioux City, Iowa, announces its 6-volt De-Luxe Wincharger will henceforth be sold through dealers—apart from the radio coupon arrangement—at a retail price of \$25. Former arrangement, under which purchasers of a new 6-volt farm radio receive a coupon permitting purchase of the 6-volt Wincharger at \$15, will still prevail. Object of new set-up is to make Winchargers available to the thousands of present battery-set owners who want to be free of battery-charging troubles. "Beauty of new set-up, from the dealer's standpoint," explains Sales Manager W. W. Watts, "is, of course, that there is a \$10 profit for dealer in the \$25 price, whereas the sale of a Wincharger at \$15 has always been a no-profit transaction for dealer. However, many dealers will sell radios to customers who come in to buy Winchargers at \$25, as the \$10 saving with a radio, is an important sales argument." Distributors for the 21 radio manufacturers using Wincharger who wish to stimulate 6-volt farm-radio sales, will continue to handle this wind-driven generator on a no-profit basis.



JIMMIE DAVIN, just-named assistant to Grunow president.

★ Arturo Toscanini, famed conductor, has accepted an invitation of David Sarnoff, RCA chief, to return to U. S. and broadcast a series of concerts with the NBC Symphony Orchestra. Series will be non-commercial, will get the biggest possible hook-up, are scheduled to begin late this year.

★ Radiobar Co. of America, Los Angeles, Calif., has appointed Reiss Advertising, Inc., 1270 Sixth Ave., New York, to direct its account.

★ Edward McCarthy has announced his resignation as division radio manager for GE in Chicago. A vet radio man, his specialties have also included refrigeration, cabinets and tubes. After a Florida vacation he will return to the East.



NOW IN CHARGE of engineering and production for Standard Transformer Corp. Everett E. Gramer.

(CONTINUED FROM PAGE 4)

HERE'S THE GREAT BIG BEAUTIFUL NEW Grunow FOR 1937 AIR-CONDITIONED REFRIGERATION FOR EVERYONE!

WITH THE
AMAZING NEW "AERATOR"
(STOPS THAT ODOR)
THE **ECONO-PHASE VACUUM UNIT**
AND THE **HANDY SERV-SHELF**

**THE "SEAL OF APPROVAL"
ON EVERY BOX**

To Assure Purchasers of Faster
Freezing . . . Uniform Shelf Temperature
. . . Food Odor Prevention . . . and
Double Ice-Cube Capacity



★ Here it is . . . the refrigerator with the **SELL!** The great big new beautiful Grunow Refrigerator for 1937. Enthusiastic dealers everywhere say that here is another merchandising *natural* . . . with the same kind of sales "IT" that made **TELEDIAL** the 1937 sensation of the radio industry. And why not? Look at all the performance features that can really be *demonstrated!* . . . Faster freezing! . . . Double ice-cube capacity (168 cubes) even in lowest priced models! . . . The amazing new **AERATOR** that sweeps the interior clean of all food odors! . . . The marvelous Carrene Econo-Phase Vacuum Freezing Unit! . . . And new cabinet styles by Walker, the ace of industrial designers! Then there's a brand new finance plan . . . a new factory service plan . . . and the most unusual advertising campaign ever put behind the merchandising of a mechanical refrigerator! Get full details today by mailing the coupon, or by wire!

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CHICAGO, ILLINOIS MARION, INDIANA

*Manufacturers of Grunow Carrene Refrigerator & Grunow
Household Radios • Grunow Automobile Radios*

**Ask About the New
GRUNOW LOW-COST FINANCE PLAN!**

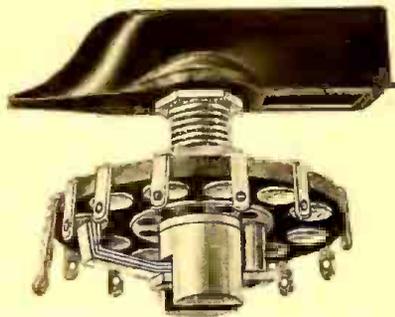
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GENERAL HOUSEHOLD UTILITIES COMPANY
2684 N. Pulaski Rd., Chicago, Illinois
Gentlemen:—Please send **AT ONCE**, with no obligation on my part,
complete information about the 1937 Grunow Refrigerator Line, and
put me in touch with my nearest Grunow Distributor.

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

NEW THINGS FROM THE MANUFACTURERS

Rotary instrument switches



★ Switches with low contact resistance and high surface leakage. Multiple leaf phosphor bronze switch arms.—constant contact resistance—0.0015 ohm or less. Available in single and double deck with 11 points—silver or brass contacts. Illustrated type 531—brass list \$2, silver \$2.50. Shallcross Mfg. Co., 10 Jackson Ave., Collingdale, Pa.—RADIO TODAY.

Tube checker & multi-meter



★ Power output emission type checker. Neon test for shorts and opens. Separate diode test. Metered paper condenser test—electrolytic leakage. DC volts, mils, ohms. AC volts and decibel meter. Portable-counter type case of oak. Model 1504—net \$56.67. Triplett Electrical Instrument Corp., 122 Main St., Bluffton, Ohio—RADIO TODAY.—See also advt. p. 39.

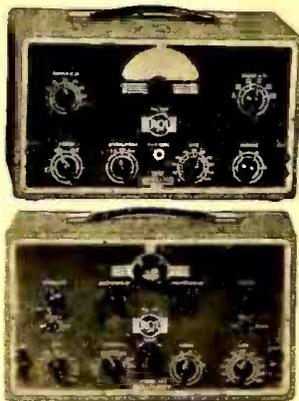
Million test instruments



★ 3 new instruments by Million included tube checker TM (\$18.95 net), tube tester with analyzer TV (\$27.95), AC-DC multi-meter VO (\$19.95). Type TM has a good-bad meter for tube tests and hot neon leakage—line voltage adjustment. Tests condensers for leakage. TV

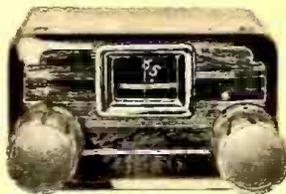
same as TM but with analyzer scales: 0/3/3/30/300/600 mils; 0/30/300/900 DC volts at 5000 ohms per volt; 0/10M/15 megs resistance; .01-3 mfd. 0-9 amperes. Has illuminated meter. Million Radio & Telev. Labs., 361 W. Superior St., Chicago, Ill.—RADIO TODAY.

RCA test equipment



★ Cathode ray oscillograph using 913 tube—vertical and horizontal amplifiers flat from 30-10,000 cycles. Linear sweep circuit 30-10,000 cycles. Sensitivity 1.75 volts RMS for full-scale deflection—calibrated screen. Focus and beam centering controls. Model 151—net \$47.50. Electronic frequency sweep oscillator. Tunes 90-32,000 KC on fundamental. Variable sweep—1 to 40 KC. Internal 400 cycle modulation or external. 4-inch diameter dial—dual ratio vernier. Air trimmer condensers for stability. High R-F output of .25 volts. Model 150—net \$64.50 RCA Mfg. Co., Cooper & Front Sts., Camden, N. J.—RADIO TODAY.—See also advt. p. 54.

Auto radio controls



★ Line of single unit control heads to fit all 1935, '36, '37 auto instrument panels. Plates and knobs match finish and color of car panel. Rapidly installed without cutting of filing—perfect fits. Bulletin 37-A available. Universal Controls, Inc., 41-07 40th Ave., Long Island City, N. Y.—See also advt. p. 60.

AC line ballast

★ Metal self-regulating line ballasts for AC sets of from 5 to 24 tubes. 4-prong plug for insertion in receiver. Also with plain prongs for use at outlet. Practically indestructible—guaranteed 18 months. Maintain steady voltage and prevent overload. List \$2. J. F. D. Mfg. Co., 4111 Ft. Hamilton Pky., Brooklyn, N. Y.—RADIO TODAY.

Dykanol capacitors



★ Line of hermetically sealed can type condensers. Dykanol condensers are compact and light weight. High voltage ratings and negligible power factor. Specifications in catalog 135A. Cornell-Dubilier Corp., South Plainfield, N. J.—RADIO TODAY.—See also advt. p. 57.

All-wave line filter



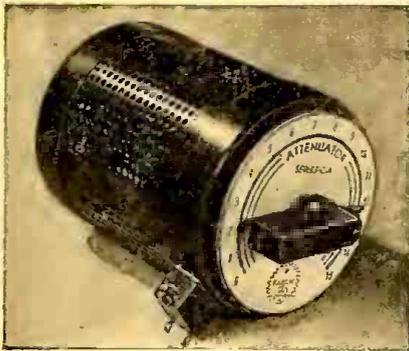
★ Scientifically designed for eliminating noise interference which comes in over the power lines. Has receptacle for plug from receiver. List \$3. Philmore Mfg. Co., Inc., 115 University Pl., New York, N. Y.—RADIO TODAY.

Radio test panel



★ Complete radio service laboratory. Left section has all-wave signal generator—100-30,000 KC on fundamentals. Output meter in volts and watts (when used with built-in test speaker). Center section for AC and DC testing with separate meters—resistance, capacity, inductance, leakage, volts, current. Right section has universal speaker with substitute field, DC volt-ammeter for vibrator tests. 12-inch lumiline bulbs provide diffused lighting. Type 652. United Motors Service, 3044 Grand Blvd., Detroit, Mich.—RADIO TODAY.

Constant impedance output attenuator



★ Power type attenuator with low insertion loss—constant impedance. Will dissipate 25 watts continuously. Used as output level control for power amplifiers. Available in 8,15,50,200,250, 500 ohms impedances. Minimum insertion loss of 1.3 DB. 15 steps—each of 3DB. Type CIA. Clarostat Mfg. Co., Inc., 285 N. 6th St., Brooklyn, N. Y.—RADIO TODAY.—See also advt. p. 64.

Vocaphone intercommunicator



★ Inter-office system of amplified communication. Master unit provides instant connection with one to six remote stations. High amplification permits pick-up over a great distance. Easily operated. Operates from AC and DC lines. Miles Reproducer, Inc., 112 W. 14th St., New York, N. Y.—RADIO TODAY.

Wright-DeCoster speaker



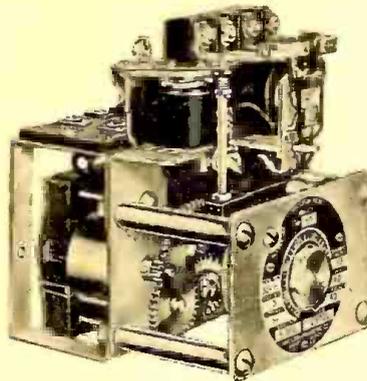
★ 12-inch permanent magnet dynamic speaker. Power handling capability of 15 watts. Para-curve diaphragm type covers 50-10,000 cycles. Standard diaphragm model has frequency range 50-6,000 cycles. Water-

proof cone and solid center spider. Enclosed type construction protects field magnets and output transformer. Type 1984—list \$19.84. Wright-DeCoster, Inc., St. Paul, Minn.—RADIO TODAY.—See also advt. p. 48.

Red-Head condensers

★ Line of paper and electrolytic capacitors. Dry electrolytics in cans, wax cartons—multiple and single units. Other types are tubular electrolytic, tubular paper, and transmitting filters. Red-Head condensers available in standard capacitances and voltages. Consolidated Wire & Associated Corps., 512 S. Peoria St., Chicago, Ill.—RADIO TODAY.

Time delay relay



★ Motor driven time-delay relay for transmitters and other devices which require a delay in switching operations. Made with delays of 35 seconds to 63 minutes. Time adjustable up to maximum limit of delay. Uses AC synchronous motor—motor disconnected after contacts are tripped. Available in various switch combinations. List \$35—\$36 depending upon contact arrangement. Ward Leonard Electric Co., Mt. Vernon, N. Y.—RADIO TODAY.

Knock-down steel cabinets



★ Black crystallized-finish steel cabinets for test equipment and amplifiers. Assembled with self-tapping screws. Available in 7 sizes from 9x 5x6 inches to 18x12x9 inches. Cadmium plated steel chassis available to fit in cabinets. Insuline Corp. of America, 25 Park Place, New York, N. Y.—RADIO TODAY.

AC voltmeters

★ Pocket size line of voltmeters and ammeters. Permalloy moving vane—magnetic damping—shielded from stray magnetic fields. Knife edge pointer and mirror scale. Textolite case 5½ x 3½ x 2 inches. Accuracy within 1 per cent—range selector switch on multi-range instruments. Model AS-5—range 0/150/300 volts AC—list \$42.50. General Electric Co., Schenectady, N. Y.—RADIO TODAY

Line-noise filter



★ Popular-priced line filter housed in round polished aluminum casing with standard receptacle and ground binding post. Has rubber-covered cord. Effective in broadcast and short-wave band—50 DB attenuation. Type 104—list \$4. Technical Appliance Corp., 17 E. 16th St., New York, N. Y.—RADIO TODAY.

Triumph signal generator



★ All-wave signal generator from 100 to 27,000 KC on direct calibrated harmonics. Modulation—30 per cent at 400 cycles—or external. Max. output of .2 volt for AFC work. Practically zero output when attenuator is set at minimum. Calibrated output from 1 to 50,000 microvolts. 6C6 oscillator with suppressor grid modulation. Black metal case—AC operation. Model 120—net \$23.95. Triumph Mfg. Co., 4017 W. Lake St., Chicago, Ill.—RADIO TODAY.—See also advt. p. 61.

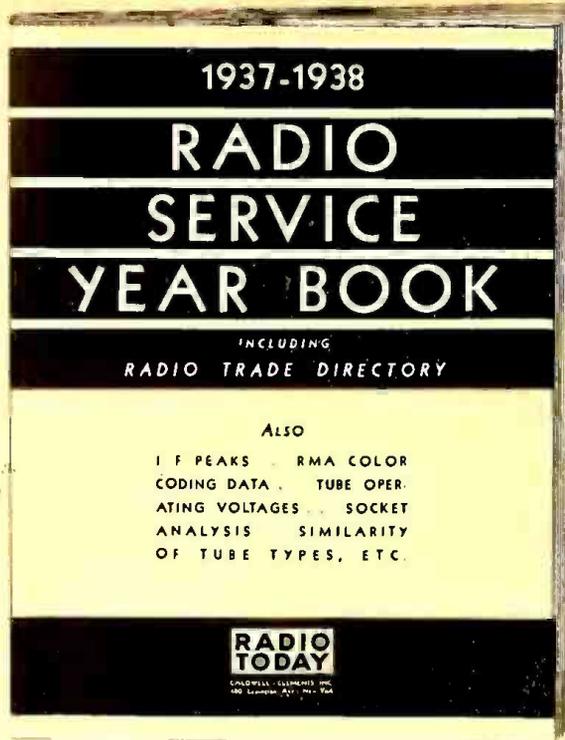
Acoustic vari-deflector

★ Speaker baffle with adjustable louvres for directing sound coverage. Simplifies problem of adequate indoor covering by providing a control of direction of sound projection—mounts horizontally or vertically. Internal acoustic treatment eliminates reso-



nances. Houses speakers up to 13-inch cone diameter—max. depth 9-inches. List \$12.50. Atlas Sound Corp., 1451 39th St., Brooklyn, N. Y.—RADIO TODAY.

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No stamp needed on this card—it is ready for mailing.

TRADE FLASHES

★ Messrs. J. H. Hopwood, R. Eshman, W. H. Hayward and D. B. Keller have been named special field representatives for Fairbanks-Morse. This move on the part of FM, according to W. Paul Jones, home appliance division general manager, is part of the FM 1937 program; duties of the four new reps will be to aid jobbers in applying sales plans and to adapt the national program to local conditions.

★ Ralph C. Cameron has been named as manager for the department store sales division of the appliance and merchandising dept. of GE. He has been active with GE for the past 7 years; for some time he has directed dept. store activity in kitchen appliances, and now will supervise sales for radios and all household appliances.

★ In its new building at 3997 Perkins Ave., Cleveland, Ohio, the Brush Development Co. will triple its present capacity, according to A. L. Williams, president of the firm. New and improved plant equipment in also part of the expansion set-up.

★ New vice-president in charge of engineering and production for Standard Transformer Corp., Chicago, is Everett E. Gramer. With the Stancor organization since 1930, Mr. Gramer had previously spent 2 years with Transformer Corp. of America. As Stancor's chief engineer before the current promotion, Gramer became interested in sales promotion in the Chicago area.

★ AudiVision, a division of TradeWays, Inc., 285 Madison Ave., N. Y. C., has recently produced new talking slide-films for both RCA and General Electric. Pictures in the appliance section of RADIO TODAY for January were taken from new GE films; this month AudiVision has supplied photos from RCA's picture, "The Triple Play," presented under the title, "Tubes As Sales Wedges." Currently interested in radio promotion is TradeWays' popular vice-president, Bernard Weitzer.



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... and here are the reasons why

They're specially designed and built for radio application.

They're standard **original** equipment on practically all makes of auto radios.

They provide smooth, sensitive tuning, without "stiff" spots or "jumping."

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INDUSTRIAL DIVISION

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JFD AUTO RADIO REMOTE-O-CABLE REPLACER



With the Remote-O-Cable Replacer, a supply of shafting and casing, same as used by leading manufacturers and an assortment of fittings, you can immediately deliver any length or type of Auto Radio Control Cable. Properly connect any auto radio to any dashboard head.

Auto radio jobbers, distributors and servicemen write for full particulars.

J. F. D. MANUFACTURING COMPANY
4111 Fort Hamilton Parkway
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Diagram labels: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, G1, G2, G3, P5, C1, C2, C3, C4, CR1, CB25, CB2L, P6, A, C, P7, P8.

HAILED BY "SOUND" DEALERS THE HIT OF THE SEASON



TYPE OC-2

WEBSTER - CHICAGO'S *New* INTER-OFFICE COMMUNICATION SYSTEMS

TYPE OC-2 is the two station system. Operates on either A.C. or D.C. 110 volts. System consists of two amplifier units, each being housed in an attractive cabinet with ebony finish. Separate volume control for adjusting to any degree of loudness. Unit is very sensitive and ordinary conversation can be picked up across the desk. Free from hum or noise, and conversation is entirely private.

TYPE OCM is the multiple system for any number of stations up to ten. A selector switch permits picking any station for private conversation. Housed in identical cabinet to Type OC-2, and has the same features of construction, including operation on either A.C. or D.C. 110 Volt.

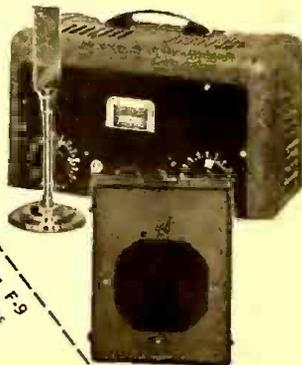
SPECIAL DEALER SALES HELPS

This looks like the big money maker of 1937 for aggressive Radio dealers. Webster - Chicago has prepared an attractive mailing piece that will help open doors for you. Don't miss this opportunity. Get started now. Write for full information.

WEBSTER - CHICAGO

Manufactures a complete line of sound equipment and accessories including factory call systems, school systems, theatre equipment, etc.

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- Fully Licensed
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 3625 W. Lake St., Chicago, Ill. Section F-9

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This new Test Equipment offers many new features. Designed by RCA engineers to make your job simpler, faster and more precisely efficient. Ideal for visual alignment, vibrator testing, checking modulation, distortion and all other general oscillographic applications.

Check the features! Consider how helpful this equipment can be to you. Then get it and put it to work!

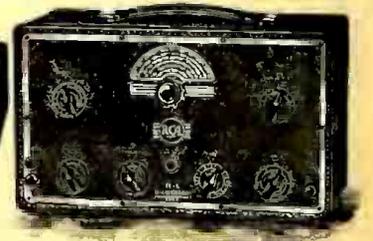


NEW
 RCA CATHODE RAY
 OSCILLOGRAPH
 NET PRICE \$4750
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FEATURES

- 1 COMPLETE oscillograph using new RCA-913 Cathode Ray Tube—ready for every service application.
- 2 High Sensitivity—1.75 volts (RMS) for full-scale deflection.
- 3 Vertical and horizontal amplifiers—Individual gain controls—Flat 30-10,000 cycles.
- 4 Linear Timing Axis—Range 30-10,000 cycles.
- 5 Small spot diameter, sharp focus—Individual centering controls on front panel.
- 6 Removable light shield—Excludes room light and gives intense image. Calibration screen provided.
- 7 A-C operated—Input power, 50 watts.
- 8 Ruggedly built—Snap-out leather handle—Symmetrical appearance for use with new Test Oscillator. New two-tone gray, wrinkle finish with highly polished nickel silver etched panel.

NEW
 RCA ELECTRONIC
 SWEEP TEST OSCILLATOR
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FEATURES

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AMPLIFIER OPERATION—SERVICE

(Continued from page 28)

load resistance which is very low—actually equal to the internal tube resistance. Note how much longer the upper part of the line is for a positive swing of the grid voltage than the negative. Plenty of distortion would result from such operation.

High load resistance

The light line represents a very high value of load resistance. Since with this value the operation of the tube is limited to rather high values of instantaneous plate currents, the effects of curvature of the characteristics at low plate currents are avoided, thereby reducing distortion.

For a voltage amplifier a high plate resistance is desirable. Note that for a 50-volt grid swing with the high resistance load that the plate voltage swing E_{pmax} minus E_{pmin} is greater—in other words more voltage is obtainable from the amplifier for higher values of load resistance.

Just how the load resistance affects power output and voltage output or amplification is another desirable thing to know. Assuming an ideal amplifier tube with a constant plate resistance, we can theorize using a circuit such as Fig. 6. Here we have the plate resistance R_p (impedance) in series with the load resistance R_L . A generator feeds a voltage into the series combination—the value of this voltage is $\mu \times E_{sig}$ where μ is the amplifier factor and E_{sig} the signal applied to the grid of the tube.

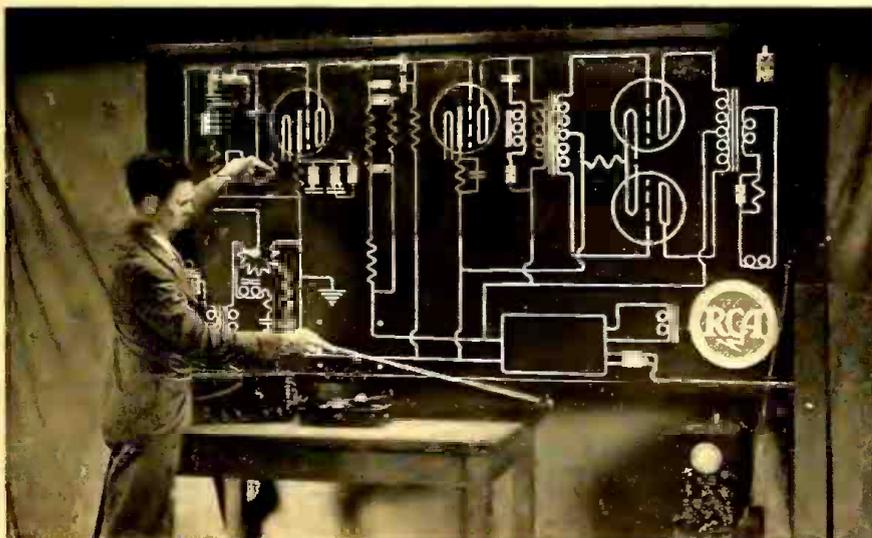
Off hand one would expect to get 10 times as much voltage out of an amplifier as was put in if the amplifier factor of the tube were 10. But such is not the case, since the plate impedance and load resistance are in series. If the plate and load resistance are equal, one half of the available voltage is across the load and half across the tube itself—therefore the actual amplification obtainable from the stage is 5 instead of 10. The reason for this is that the voltage divides across the two resistances in proportion to the resistance values.

Amplifier gain

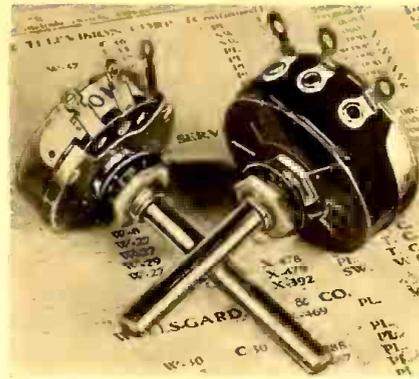
Fig. 7 shows the variation of gain with load resistance. To realize anywhere near the full amplification capability of the tube, it is necessary to use resistance values equal to 10 or more times the internal tube resistance.

In Fig. 8 a similar plot is made for a screen grid tube having an amplification factor of 1500—practically it is possible to realize only a small fraction of this amplification since the internal resistance of a screen grid tube is on the order of 1 to 1.5 megs. However, even with a relatively low load resistance it is possible to get very great amplification from the tube.

As was pointed out before, and illustrated in Fig. 5, a high value of load resistance gives a greater voltage output (or amplification) for a given signal input.



Lecture and demonstration board developed by RCA to be used in explaining the operation of amplifiers. Circuits shown are actually wired up behind the schematic. A cathode ray oscillograph is used to illustrate the effect of varying the circuit parameters—and switches are used to cut-in and short various condensers and resistors. A number of these demonstrators will be used throughout the country in RCA's new series of service lectures commencing immediately.



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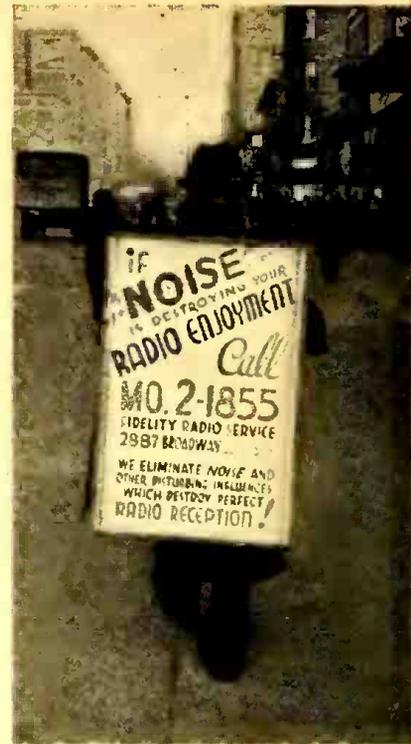
SERVICE NOTES

There is a basic electrical law which states that the power output of a device is maximum when the external load resistance is equal to the internal (plate) resistance. So for maximum power output, the external load should equal the plate resistance. But for single-tube amplifiers, this value cannot be used because it introduces excessive distortion as was pointed out for Fig. 5. Practical applications for triodes dictate a load resistance equal to at least twice the plate resistance. While the power output is decreased slightly, the distortion is greatly reduced.

Pentode amplifiers

Pentode power tubes offer an entirely different problem than triodes. In Fig. 9 is a set of curves for a pentode tube (a type 47). Note how they differ from those of the triode. Two load resistances are drawn on this chart—one whose value is equal to the internal plate resistance of the tube. The second one with a steeper slope is the value usually employed (heavy line).

If we again take P as the operating point and a maximum voltage



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swing of 15.3 we have the maximum and minimum instantaneous grid voltages E_{c1} equal 0 and 30.5 as the limits of operation on the 7000 ohm line.

But considering the 60,000 ohm line, it is evident that the left hand section X-P is much less than the right hand P-Y for a grid swing of 15.3 volts. Plenty of distortion is the result. The reason is that the curves all bunch together at the left hand part of the curve. Point X is on the diagram, but Y is actually way out to the right off the illustration. With the pentode power amplifier, under-biasing will result in distortion of the upper part of the current wave due to the plate current characteristics being squeezed together. Over-biasing will also produce distortion as in the triode amplifier. Note how in Fig. 9 as the bias is increased, the lines come closer together for equal differences in bias. This is a source of distortion as much as curved characteristics are.

In both triode and pentode R-F and I-F amplifiers, the bias and load resistance considerations are far less important than in audio stages since the applied signal voltages are usually very small. Ordinarily the load resistance is made as high as possible for maximum gain—and the tube biased to such a point that linear operation is obtained over a small re-

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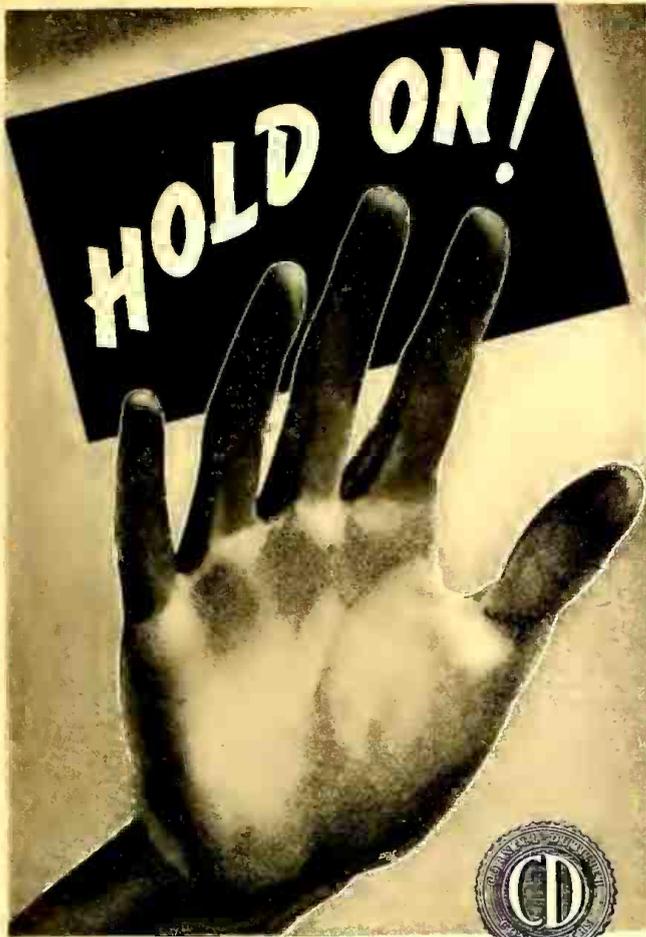
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SERVICE NOTES

giou—extremely large signals are seldom if ever handled in these stages.

From this discussion the importance of proper operating conditions is obvious. What the suggested values are for various tubes is obtainable from the various tube manuals published by the leading tube manufacturers. While most set manufacturers adhere quite close to suggested operating characteristics, it is possible to use many other values and obtain satisfactory results provided that *all factors* are properly taken into account. But in any case, the basic operation and principles of the amplifiers are the same.

STANDARD I. F. PEAK

★ R.M.A. Standards Section is now working on a plan to standardize an I.F. peak for superheterodyne receivers. Idea is to get all new receivers on a single frequency where inference will be minimum—it is also expected that the FCC will take steps to minimize commercial transmissions on the standard I.F. peak and in general protect that frequency.

Service man's angle of the standard I.F. peak is that all future sets can be aligned at a single frequency—perhaps a stable and accurate crystal oscillator will be developed for that purpose. Present R.M.A. plans lean to an adoption of 455 KC as the standard I.F. peak.

DRYING OUT SETS

★ Those inexpensive hair-dryers with a heating unit and blower are excellent devices for drying out damp radios. Constant change of air takes away the moisture rapidly and the heat increases the speed of evaporation.

When reclaiming the water-soaked sets in the flood area it is essential that the receivers be thoroughly dried out; otherwise application of power is likely to burn out many parts that might be workable when dry.

If any large number of sets are to be dried out at once, a small room that can be overheated by the regular heating system is ideal. However, the air must be changed frequently to carry away the water vapor. An oven might possibly be employed if care is taken not to melt the wax out of condensers and transformers—a change of air must be provided for.

R. G. Sceli of Radio Inspection Service Co., Hartford, Conn., says the following about repairing flood-damaged sets based on last year's experience:

"I don't believe we repaired over six of them. The majority of them were in such a condition that repairs would have been foolish. However, a few machines which were promptly put in an oven and baked out after the waters receded, came out very well with merely minor repairs such as replacing electrolytic condensers and one or two resistors.

"The trouble seemed to be that most of the cabinets were completely wrecked, and if you have ever seen a veneered cabinet after it has been wet, you wouldn't wonder why people didn't want to do anything about it."

★ Vest pocket booklet carrying a condensed discussion of the elimination of man-made interference may be obtained from Continental Carbon, Inc., 13900 Lorain Ave., Cleveland, Ohio. Bulletin is illustrated and has 24 pages; price is 10 cents postpaid.

★ Catalog No. 15, titled "Rheostats, Resistors and Tap Switches for the Radio, Industrial and Electronic Fields," has been issued by Ohmite Mfg. Co., 4835 Flournoy St., Chicago, Ill., and will be sent free upon request.

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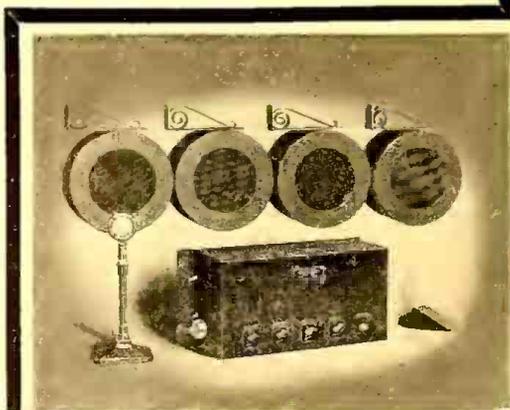
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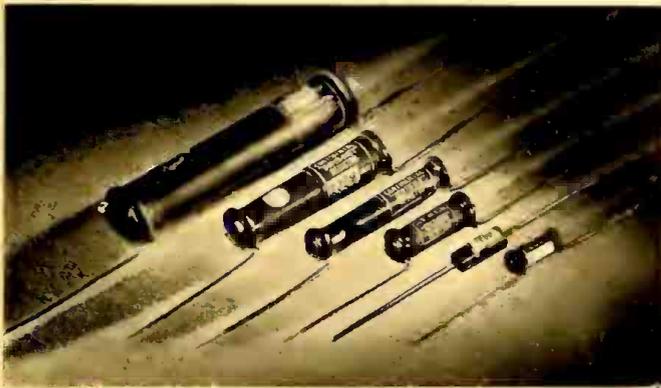
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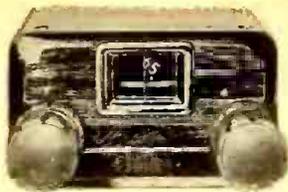
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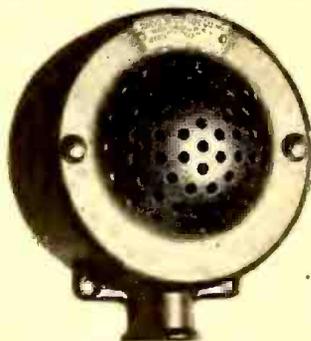
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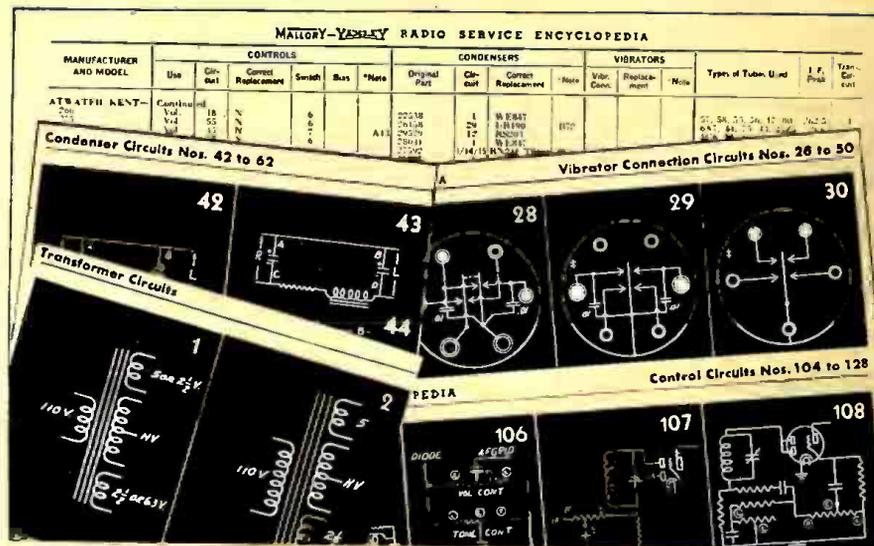
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ing devices, antennas, auto radio interference, alignment, AFC, proper replacement of various parts.

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★ Presented to servicemen free of charge is a new booklet titled "101 Radio Troubles and Their Cures," issued by Readrite Meter Works, Bluffton, Ohio. Pamphlet was compiled by Ranger-Examiner engineers to help solve the more common reception problems.

★ Champion Radio Works, Lynn, Mass., will now furnish on request a new specification chart covering "G" glass tubes, presented in compact form.



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NEW BOOKLETS

★ To be obtained from National Union tube distributors is a new booklet listing most of the tubes brought out in the past 3 years with a limited description of each.

★ A line of Hi-Q parts for critical radio circuits and assemblies, is illustrated and described in a new bulletin just issued by Boonton Radio Corp., Boonton, N. J. Copy may be had by addressing the firm.

★ Illustrated manual on "The Mechanics of Instantaneous Acetate Recording" has been published by Radiotone Recording Co., 6103 Melrose Ave., Hollywood, Calif. Material applies to all recording apparatus on the market; author is Sam W. Hawver.

★ For Frigidaire dealers is a new "1937 Spring Plan Book," dealing with all the new elements of merchandising the new line. Elaborate booklet carries 3 blank pages to be filled in as "Planned Selling" schedules for February, March and April.

★ Available upon request is a new catalog of public address products just published by Atlas Sound Corp., 1451 39th St., Brooklyn, N. Y.

★ Booklet titled "Handy Pocket Data on Radio Interference Elimination" is a new item from Continental Carbon, Inc., 13900 Lorain Ave., Cleveland, Ohio. Cover says 10 cents.

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Signal Generator, No. 120, 100 kc to 75 mc. a.f. mod. optional, dual uv attenuator, list \$53.00	\$23⁹⁵
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**ACHIEVES
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in performance: "A magnificent instrument... Despite the climate here, results are marvelous and could not be bettered, I am sure", D. Hopkins, Raffles Hotel, Singapore.

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Models RAL (200 ohms); RAH (2000 ohms). Built to Amperite standards; No peaks. Flat response. Triple shielded. Shock absorber. Swivel bracket. **\$22.00 LIST**

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TRADE FLASHES

★ Vance C. Woodcox, sales manager of field operations, RCA Victor, announces the following new appointments: E. W. Butler, in charge of phonograph sales, under Paul C. Richardson, manager radio and phonograph division. George R. Ewald, manager Pittsburgh district. M. F. Blakeslee, manager Chicago district, replacing F. H. Larrabee, resigned. F. M. Bewsher, manager Atlanta district. District office located at New Orleans has been transferred to Memphis, Tenn. Norman Bass, formerly manager of Cincinnati district, will be Memphis district manager. D. E. Neiswander has been appointed manager Cincinnati district.

★ P. H. Tartak, president Oxford-Tartak Radio Corp., Chicago, announces the appointment of C. R. Bluzat as mid-western sales manager. Mr. Bluzat has been associated with radio since 1925 in various engineering and executive capacities. He was sales engineer for the Transformer Corp. of America, vice-president in charge of engineering and production for the Standard Transformer Corp., and president of Premier Products Inc. until his present affiliation with Oxford-Tartak.

★ The Trav-Ler Radio & Television Corp. has just added another floor to its factory facilities at 1036 W. Van Buren Street, Chicago, Ill. It now occupies three floors with a total area of more than 30,000 square feet. Jack Hoffman, president of the company, reports that 1936 was banner year in the company's history, with sales figures far ahead of 1935. New additions to the company's sales organization include Neal Baer, well known radio man who has joined the sales staff for general field work. New Trav-Ler representatives include Bernard Lippin, 180 8th Ave., New York City, who will handle Metropolitan New York and New Jersey territory; I. H. Feigenbaum, Philadelphia, and James Hayes, Eastern Trade Associates, Boston, Mass.

★ George A. Scoville, vice-president and general manager for Stromberg-Carlson has announced that all divisions of the company, engineering, production, sales and advertising, will be geared up to handle big sales increases in 1937. Mr. Scoville's statement also mentioned 3 new models added to the Stromberg line, a stronger jobber organization, and higher prices on sets.

★ Philco has been forced to acquire 115,000 additional sq. ft. of manufacturing space in Philadelphia. Expansion plan will hike the production of auto sets 50 per cent; new plant will require 900 workers, and will be used for auto radio assembly, export conversion, packing voice coil winding and warehousing.

★ Offered to jobbers for re-issue to dealers and servicemen, is a new sales help in the form of a combined calendar and order card holder presented by Hygrade Sylvania Corp. Item is designed to hang on the wall and may be had at nominal charges.



**Complete
Electric Plants**

ONAN ALTERNATING CURRENT GENERATING PLANTS furnish the same electricity as city power lines. Made in sizes 350 to 10,000 watts to meet the requirements of those who must provide their own electricity for Farms, Summer Camps, Cottages, Boats, Commercial Purposes.

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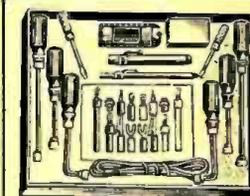
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Write Today for Complete Catalog No. 37

American

RADIO HARDWARE CO., Inc.
476 Broadway, New York, N. Y.

★ Southern California Radio & Refrigerator Dealers Ass'n. was one of the organizations in on a big co-operative move to get everybody in the Los Angeles area to listen to the Presidential inauguration broadcasts Jan. 20. Dealers loaned hundreds of sets to schools during the drive, working with KNX, the CBS Pacific outlet, the Los Angeles Examiner, and a group of municipal and civic groups.

★ New radio store in Greensboro, N. C., is the Cashwell Electric Co., recently opened by Dave Cashwell at 110 S. Green St. Store will sell Norge appliances and Zenith Radios, according to officials of Southern Bearings & Parts Co., Charlotte, N. C., distributors for those two lines.

★ Czechoslovakia recently placed an order for all-wave Philco receivers for its diplomatic corps in 19 countries, to link its Ministers and Charges d'affairs with the home country by air. Also Uruguay placed a trial order for 220 Philco receivers for use in that country's public school system, long recognized as one of the finest in the Western Hemisphere. These announcements were made by the American Steel Export Co., Inc., of New York, Philco's export agents.

★ Arcturus Radio Tube Co., Newark, N. J., has notified all of its distributors and many dealers in the flood areas that tubes and cartons damaged by the flood will be reconditioned and reboxed, free of charge.

★ Paul H. Tartak, president of Oxford-Tartak Radio Corp., has acquired the controlling interest in Premier Products, Inc. Mr. Tartak announces the removal of the plant and offices to a new and larger location at 915 W. Van Buren Street, Chicago.

★ Breaking all attendance records for recent dealer meetings, more than 2,500 members of the Metropolitan New York trade attended a pre-view of Fairbanks-Morse refrig-

eration products at the Park Central Hotel on Jan. 17th, under the auspices of Fairbanks-Morse and Bruno-New York, Inc., local distributors for this company's refrigeration line. Irving Sarnoff, vice president of the distributing organization, functioned as toastmaster, and the presentation of the new products was handled ably by W. P. Jones, vice president and general manager of Fairbanks-Morse and Parker H. Erickson of the company's sales executive organization. More than 1500 dealers attended the dinner, and during the course of the evening, four ballrooms were utilized for the large crowd who danced to the music of three orchestras and who also paid close attention to a specially engaged floor-show.

★ Bruno Laboratories, Inc., mike manufacturers, have moved from 20 West 22nd St. to new quarters at 30 West 15th St., N.Y.C. Firm has leased 10,000 additional square feet at the new site, and have installed equipment to make the production of the new Velotron mike completely automatic.

★ Foreign division of Crosley Radio Corp. has reported that the company's products are now being sold in 120 countries and colonies throughout the world. A. G. Lindsay is manager of the division.

★ Elaborate plans have been made by GE for 450 New York and New Jersey radio dealers and their wives to sail on Feb. 27th for a 6-day winter vacation cruise to Bermuda. Trip will be made on the luxurious S.S. Volendam; GE's district radio sales manager D. W. May is heading the activity.

★ I. E. Reid, president of American Electric Co., St. Joseph, Mo., who is described as the oldest distributor for Crosley, was honored last month by a surprise party staged by his organization. Congratulatory telegrams arrived from all parts of the U. S., including one from Powel Crosley, Jr., president, Crosley Radio Corp., Cincinnati.

★ Important in the GE sales set-up are the facts: Fred A. Ray has been promoted to be district radio sales manager for the Cleveland area: W. P. "Bill" Saunders has been named sales manager for the Middle Atlantic district with headquarters in Philadelphia; George S. Peterson has been appointed sales manager of factory sales branches in Chicago and Peoria, Ill.

38 Amazing RADIOS



1937 Knight Radios offer you unbeatable profit-making opportunities! Sensational new features include giant 11-in. Magna-Span Dials and super-dynamic Vita-Tone Speakers. Unmatched performance, at amazingly low prices. 38 models, 5-19 tubes, as low as \$8.45!

10,000 Service Parts

You can fill every service need from the ALLIED Catalog—at lowest prices. Lists over 10,000 exact duplicate and replacement parts, complete test equipment, tools, books, etc. You save time, trouble and money on every purchase by ordering from ALLIED.



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This great 152-page Catalog also shows newest sound systems, amateur gear, kits, Rurlpower units and Windchargers, etc. Whatever you need, you'll always find it in the ALLIED Catalog at the lowest prices.

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833 W. Jackson Blvd., Chicago, Ill.
Send us your new 1937 Catalog (Free).

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CATHODE-RAY Equipment for 1/2 Price!

Clough-Brengle Model 105 Oscillograph \$48.90 NET

with 30,000-cycle sweep, dual amplifiers, etc.

For half the former investment, you now can equip your shop with this profit building C-Ray oscillograph. The new MODEL 105 is the only one-inch oscillograph equal in completeness and performance to the larger types with features such as: a wider range sweep circuit, 15 to 30,000 cycles, dual amplifiers linear to 100,000 cycles, double the usual input sensitivity (.68 volts full screen deflection), positive lock-in synchronizing circuit, and two-section power supply for complete stability.

If you want value and performance, see the MODEL 105 before buying. Complete in every detail. Nothing extra to buy. Your C-B jobber now has it in stock.

Both single and double trace selectivity curves are obtained only with C-B Cathode-Ray equipment due to use of the exclusive "Inductor-Sweep" principle.

Modernize Your Oscillator for C-Ray Application

Just connect your oscillator output to the MODEL 81-A separate frequency modulator and be ready for C-Ray alignment. No loss of calibration, drilling, or rewiring—no complicated connections. Plugs directly into the MODEL 105 or CRA oscillographs to provide either single or double trace selectivity curves. Write for descriptive bulletin.

The CLOUGH-BRENGLE CO.

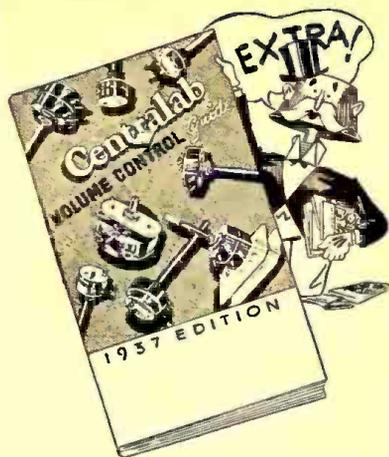
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Send at once full description of the new MODEL 105 Cathode-ray oscillograph and time payment order blank.

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Address

See Your Jobber Today — Or Use This Coupon



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83% more pages . . . listing 400 makes and 7,000 models . . . up to the minute — including 1936 and early '37 receivers. Shows how a mere handful of standard controls will service most every set — and — for that unusual job, we list special replacement controls.

Sound projection and tone control switch data is generously featured. Often called the "serviceman's bible" . . . it should be on every service bench, and in every service kit.

As usual it is yours for the asking.

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From Your Jobber

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Paris XI, France

DOPE ON DISTRIBUTORS



TWIN CITY Philco dealers shown here reversed the usual custom and threw a big party to honor L. W. and R. B. Cohen of the Roycraft Co., Minneapolis jobbers.

★ Ditch, Bowers & Taylor, Inc., Baltimore, Md., distributors of American Bosch sets and Hygrade Sylvania tubes, have added 3 new salesmen to the staff: J. J. Matthews to cover western Maryland; Harry Bentz, for Baltimore City; and George Habler for the eastern part of Maryland.

★ RCA Victor Distributing Corp., Chicago, has announced the appointment of Harry D. Schoenwald as sales manager, Harold Renholm as ad manager, and W. T. Meyers as manager of the record dept.

★ Appliances, Inc., the Cincinnati distributors for Fairbanks-Morse, have established a new wholesale division at 130 N. St. Clair St., Dayton, Ohio. Featured at the location will be a modern display room and a new service organization of factory trained men headed by Carl F. Geiger.

★ A. J. Moore, formerly merchandise manager for the Milhender-Afes Electrical Co. of Boston, is now with the Geo. H. Wahn Co., Boston jobbers for Fada sets and Raytheon tubes.

★ Wholesale Radio Service Co., New York City, encourages the "hams" of the area to call and try out the latest radio apparatus offered by the firm. Sound-proof booths are provided for the purpose; demonstrations of p.a. systems are also current.

★ Assortment of promotion aids has been assembled by GE for presentation with the company's 4 new auto radios: 1 demonstration display, 2 truck and store banners, 1 wall chart, 100 auto door handle hangers, 100 handbills, 2 window streamers, 50 folders, 4 reflectors.



CURB SERVICE expert, J. A. Swanson, parts jobber of Racine, Wis., has just moved into new headquarters with 3 times his former floor space.

CANNON-BALL HEADSETS



FOR A FAST GROWING MARKET

HEADSETS are selling faster than at any time since the inception of the loudspeaker!

Three million homes now have two or more radio sets—requiring headphones to eliminate conflict in the home—and millions of other sets, now in use, will be equipped.

The new demand for silent reception without disturbance to others is opening up a vast market for single and double headsets; not only in receivers now in use but in the millions that are added every year. Manufacturers are beginning to install adaptors or switches, or otherwise wire their receivers to take headphones.

In central radio, also, the trend is to headsets. And, of course, the group-hearing aid is solely a headphone proposition.

Jobbers, dealers, servicemen, installers of central radio and group-hearing aids, will find a RESPONSIVE MARKET for EFFICIENT, LIGHT WEIGHT, GOOD-LOOKING 'PHONES—a profitable market, too. We are receiving orders, large and small, from every state in the Union and many foreign countries.

Pictured above is one of our leaders—the DIXIE "OLD FAITHFUL" CANNON-BALL, list \$2.60. Send for illustrated bulletin covering the complete Cannon-Ball line.

C. F. CANNON COMPANY

Manufacturers

SPRINGWATER

NEW YORK

JUST AS SCIENCE HAS ADDED YEARS TO THE LIFE OF MAN...



ARCTURUS

has added hours of

DEPENDABLE, TROUBLE-FREE SERVICE

to 25Z5's

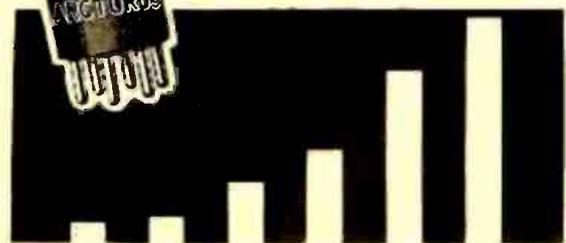
Just as scientists have added many years to average human life, so have Arcturus engineers built up the 25Z5—eliminating all the troubles, sporadic but bothersome, that seemed inherent in this tube. Prevalent have been "flash-overs"; open cathode tabs caused by overloads; slow-heating; shorts with resultant blown filter condensers; filament failures in excess of normal. . . . The new Arcturus 25Z5 protects users from these troubles. A high margin of safety built into these tubes, makes this 25Z5 outperform* and outlast ordinary tubes and withstand abuse.

Start using them today—on EVERY job! Keep customers satisfied. Protect your reputation by selling only the "quality" tube—Arcturus.

ARCTURUS RADIO TUBE CO., NEWARK, N. J. U. S. A.

ARCTURUS RADIO TUBE CO., NEWARK, N. J. U. S. A.

*HERE'S THE PROOF . . .



MFR. A MFR. B MFR. C MFR. D MFR. E ARCTURUS 25Z5

There is no ordinary way to test 25Z5's effectively. You've got to treat them rough—just as they are treated in actual use. Shoot overload after overload into them. Snap them on and off constantly. Let 'em burn for many hours at a stretch. Under such an extremely severe test the Arcturus 25Z5 Tubes came through with results indicated in the accompanying graph—having an effective operating life considerably in excess of five leading competitive makes of tubes, the average life of which is also indicated!

They Heat in 11 Seconds!

ARCTURUS

INDEPENDENT TUBES FOR DEALERS WHO DO THEIR OWN INDEPENDENT THINKING

in FOOTBALL, technique. in RADIO it's RADIOTECHNIC



RADIOTECHNIC "R-T-L" announces these new and exclusive features of its short circuit test: Neon sensitivity on active element shorts—meter sensitivity on all shorts—greater than any other tester. Double checking—

neon and meter—shows what tube will do in actual service. Other equally unique and important advances in design—all new! Get complete details!

Ask For Folder

THE RADIOTECHNIC LABORATORY EVANSTON ILLINOIS

A Complete Line of Tube Test Equipment

RADIOTECHNIC

DOPE ON DISTRIBUTORS

★ Harrison Radio Co., 12 W. Broadway, N. Y. C., have been appointed exclusive distributors for Utah "ham" equipment in greater New York. Harrison plans to feature a new Add-A-Unit transmitter kit recently announced by Utah.

★ Capital City Distributing Corp., RCA distributors of Albany, N. Y., whose address has been 1039 Broadway, have now moved to new quarters at 33 Orange St., in the center of Albany's downtown section. Firm has a branch at Springfield, Mass.

★ Ernest and Harold Ammerman, of the Radio Accessories Co., jobbing firm of Orlando, Fla., recently went to Owensboro, Ky., to visit the Ken-Rad tube plant. Next day after their arrival, all roads were closed due to flood waters; the boys were marooned for two weeks.

★ W. M. Dutton & Sons, the Hastings, Neb., distributors of Emerson sets, RCA and Hygrade Sylvania tubes and Leonard refrigerators, have just acquired ABC washers and irons.



HIGH GRADE JOBBERS, this time spelled "Hygrade" because these are the gentlemen present at Hygrade Sylvania's sales meeting for southeastern jobbers held at Atlanta, Ga., Jan. 15-16. Hosts were Fulwiler & Chapman, the tube company's representatives there. Find these numbers in the picture:

1—W. C. Boyd—Balling Electric Co., Jackson, Miss.; 2—A. J. Wheeler and 3—H. Friedman—Chattanooga Paper and Woodenware Co., Chattanooga, Tenn.; 4—Tom Freck and 5—T. T. Freck—Freck Radio and Supply Co., Asheville, N. C.; 6—H. M. Carpenter—Thurrow Radio Distributors, Tampa and Miami, Fla.; 7—T. O. Roc and 8—H. A. Wilson—Long Lewis Hardware Co., Birmingham, Ala.; 9—A. I. Hickey—House Hasson

Hardware Co., Knoxville, Tenn.; 10—F. F. Dill—Chattanooga Paper and Woodenware Co., Chattanooga, Tenn.; 11—L. E. Salmon—Tennessee Valley Electric Supply Co., Tupelo, Miss.; 12—H. J. Ballum—Shuler Supply Co., New Orleans, La.; 13—J. R. McMillian—Hygrade Sylvania salesman, Atlanta; 14—J. T. Fulwiler—Hygrade Sylvania Corp. southeastern sales representative, Atlanta; 15—John C. Carter—Radio Sound and Service Co., Knoxville, Tenn.; 16—N. R. Casey—House Hasson Hardware Co., Knoxville, Tenn.; 17—Howard Crowell and 18—I. J. Pardee—Radio Sound and Service Co., Knoxville, Tenn.; 19—W. F. Joyner—Freck Radio and Supply Co., Asheville, N. C.; 20—E. E. Nelson—Nelson Radio and Supply Co., Mobile, Ala.; 21—J. R. Wiggins—Mathis & Youmans Co., Valdosta, Ga.;

22—J. G. McKnight—Perfection Mattress and Spring Co., Birmingham, Ala.; 23—J. F. Gordy—Beck and Gregg Hardware Co., Atlanta, Ga.; 24—Grady Bolt—Sullivan Hardware Co., Anderson, S. C.; 25—J. C. Luttrell—Atlanta Phonograph Co., Atlanta, Ga.; 26—P. S. Ellison—Renewal Tube Sales Manager, Hygrade Sylvania Corp., New York, N. Y.; 27—B. W. Krell and 28—F. E. Beaudry—Dixie Radio Co., Columbia, S. C.; 29—Don Follmer—southeastern representative lamp sales, Hygrade Sylvania Corp.; 30—Herndon Thomas—Peaslee-Gaulbert Co., Atlanta, Ga.; 31—A. L. Milk—renewal sales supervisor Hygrade Sylvania Corp., Emporium, Pa.; 32—C. W. Chapman—Hygrade Sylvania Corp. southeastern sales representative, Atlanta, Ga.; 33—J. W. Clary—Clary Marsh Co., Birmingham, Ala.

VELOCITY



"V" SERIES

The all-feature microphone. Preferred by discerning Sound and Communication engineers the World over. Three models priced from \$35.00 to \$75.00, list.

ELECTRO-VOICE MFG. CO., Inc.
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ELECTRO-VOICE

MICROPHONES



"K" SERIES

Genuine quality brought to the low-price field. Three models from \$19.50 to \$29.50, list. Also a Static-Velocity model of \$20.00, list.

SOLD BY LEADING JOBBERS
WRITE FOR CATALOGUE

CARBON



Five popular carbon models priced from \$5.00 to \$25.00, list. Complete repair service on all makes.

**"BULLET"
DYNAMIC MICROPHONES**



**AT LAST
an ALL-PURPOSE Microphone . . .**

T. R. 2 — Standard model "Bullet" . . . the ultimate in dynamic microphone design and performance . . . List price, any impedance . . . \$39.50.

T. R. 3 — New model "Bullet" . . . smaller than TR2 but with relatively the same characteristics . . . List price, any impedance . . . \$24.50.

Send for circular "E" and technical data

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30 Rockefeller Plaza
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SPRING
CATALOG
FREE!**

SOUND Among these 116 pages you will see the new LAFAYETTE COORDINATED SOUND SYSTEMS. A masterwork of engineering—complete systems in packaged units ready for installation.

AUTO SETS The new LAFAYETTE line of auto sets is the largest we have ever carried values that cannot be beat—quality guaranteed.

RECEIVERS The complete LAFAYETTE line ranges from 4 to 24 tubes, from \$7.95 up. Sold on the famous 30 DAY FREE TRIAL BASIS. You will marvel at these amazing bargains.

PARTS This new Catalog features more than 10,000 real values in everything you need in radio. Every conceivable part for serviceman, builder, ham and experimenter.

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100 Sixth Avenue New York, N. Y.

Please rush new 116 page FREE Catalog No. 68-12B7

NAME _____

ADDRESS _____

CITY _____ STATE _____

JOBBER NEWS

★ Recently appointed by the Emerson Radio & Phonograph Corp. as new distributors are Graybar Electric Co., Inc., Savannah, Ga.; Graybar Electric Co., Inc., Jacksonville, Fla.; Emerson-New York, Inc., New York, N. Y.; Graybar Electric Co., Inc., Atlanta, Ga.; and Emerson-New Jersey, Inc., Newark, N. J.

★ Crosley jobbers who have been recent hosts to dealers at shows held to feature the 1937 Shelvadors are: Stimpson Sales and Investment Corp., Wichita, Kan.; Greusel Co., Milwaukee; Frank H. Clay Co., Kalamazoo, Mich.; American Electric Co., Kansas City, Mo.; Apollo Distributing Co., Newark, N. J.; Crosley Distributing Corp., Chicago; Kiefer-Stewart Co., Indianapolis, Ind.; Anchor Lite Appliance Co., Pittsburgh, Pa.; Reader's Wholesale Distributors, Houston, Tex.; C. E. Hamlin Co., Jackson, Mich.; Ackerman Electrical Supply Co., Grand Rapids, Mich.; Roger & Baldwin Hdw. Co., Springfield, Mo.

★ When P. I. Burks & Co., radio distributors, 911 West Broadway, Louisville, Ky., suffered the immersion of a quantity of their stock during the recent Ohio River floods, they found that a number of radio manufacturers offered to replace the damaged material with new merchandise, without the extra cost, so that fresh stocks would be on hand. Among the lines carried by the Burks company are RCA, Solar, Yaxley, Sprague, Cornell-Dubilier, Centralab and Electrad.

★ Stewart-Warner Corp. has announced the appointment of four new distributors for radio and refrigerator lines: Dietz Distributing Co., Cincinnati, Ohio; Alemite Co., San Antonio, Tex.; Indiana Distributing Co., Indianapolis, Ind. SW appointment of Kelly-How-Thomson, Duluth, Minn., was announced earlier.

**RMA THUMBS-DOWNS
SETS AT SHOWS**

★ "Exhibition of radio sets in trade shows and public shows by set manufacturers or distributors, is not helpful to the radio business, and is not approved," according to a show policy determined unanimously by the RMA board of directors meeting at Chicago last month. RMA members have been requested to refrain from such exhibitions and also to request their distributors not to participate in local shows.

A questionnaire sent out brought replies indicating that exhibiting sets at shows "deters rather than promotes the sale of receiving sets," and the RMA directors resolved that "this Board considers the exhibition by manufacturers of receiving sets as detrimental to the industry."

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TELEVISION ARTIST gets assistance from Philco engineer Albert F. Murray.

RADIO & TELEVISION

★ TELEVISION took a step, if not a leap forward in public attention with Philco's Feb. 11 demonstration of its 441-line picture. With this advance from 345 lines to 441, RMA standards are matched with what Philco presents as its "high fidelity" system, and the problem of how to get detail in telecast pictures seems well solved.

This extraordinary show was presented for a press group invited to the Germantown Cricket Club, in North Philadelphia. Pictures were received there from the transmitter at the Philco plant, about 3 air miles away, on improved receivers which had fewer controls and fewer tubes as well as better picture quality.

Sayre M. Ramsdell, Philco vice-president, confronted the guests with answers to the popular question, "When will we have television?" Mr. Ramsdell said that it was not likely by Christmas time, this year, and named at least 5 things which will have to be done before picture broadcasting can be generally used. These were concerned with further technical standards set by the FCC, licenses, program sources, and cost.

James M. Skinner, president, Philadelphia Storage Battery Co., and chairman of the RMA television committee, explained that a definite and roomy spot in the broadcast band must officially be set aside for television. He pointed out that other

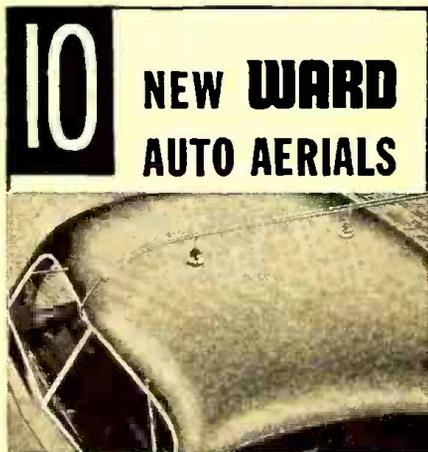
interests are already active in cinching the disputed band for themselves, and that television interests should hurry to prove the importance of their position.

Philco engineer Albert F. Murray opened the show. On each receiver appeared a black and white picture about 7½ inches by 11, watched by 17 persons per group in the darkened room. General reaction was that however the pictures behaved, their behavior was still attractive. Objects such as dollar bills, newspapers, and photos of movie stars were televised to provide a study of detail; engineers switched the system from 345 lines to 441 lines alternately so that spectators could observe the difference.

Newsreels, singers, fashion shows and a Boake Carter interview were flashed on the screens. Television camera at the Philco plant went outdoors at one point to pick up a picture of the television antenna. Sound was transmitted at 54 mc. and picture signals at 49 mc.

* * *

Although there has yet been no public demonstration, pictures of 441 lines are also being transmitted by RCA and NBC from the Empire State Tower in New York City. These have been successfully received by television receivers in the homes of RCA-NBC engineers and technicians. For these experiments, a television program technique is being developed in NBC studios.



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MODEL T. A.—The "Tur-rette." One of the new top aeriels featured by WARD for 1937.
NO DRILLING IN TOP

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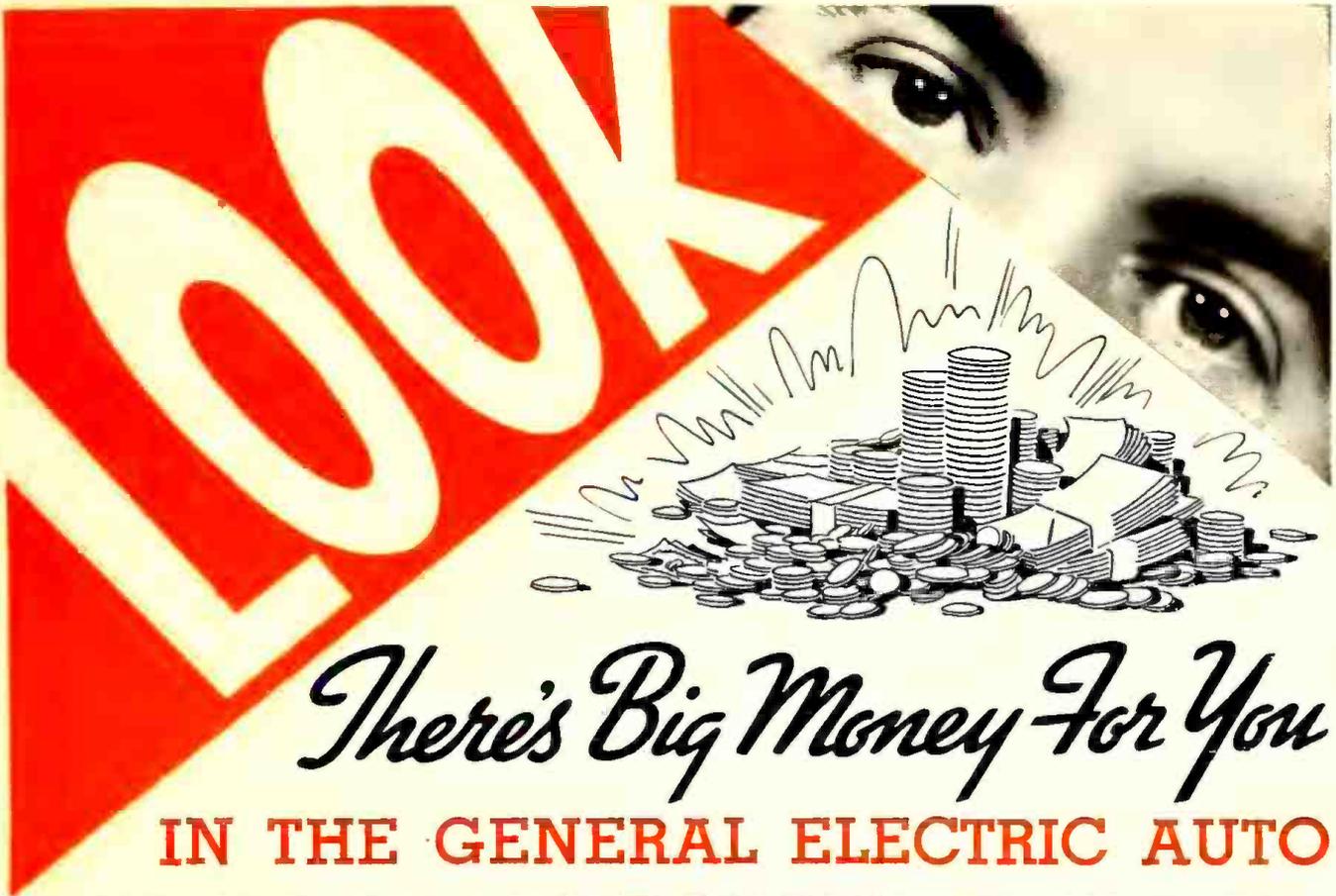
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- *Wall Chart
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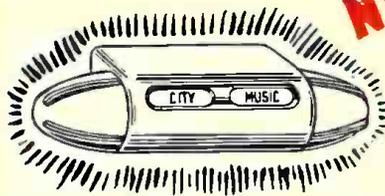
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NEW LOW PRICES



ENJOY NEW THRILLS

Be Your Own Program Director
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to Your Individual Taste

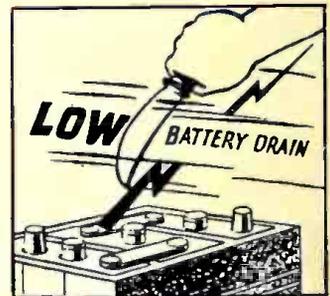
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And as you ride you can interpret programs to suit your fancy . . . (VOICE) "spotlighting" your favorite speaker or soloist—or (MUSIC) enjoying balanced musical programs—or (BASS) emphasizing the mighty, deep bass instruments.

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