

Production-Engineering-Distribution • Radio-Television-Sound Projection

RADIO Industries

With which is incorporated Radio Manufacturers' Monthly

DECEMBER • 1929

Aircraft Radio

•
An Automatic Inventory

•
Improving Attendance 200%

•
The Safety Use of Conveyors

•
A Survey of Radio Merchandising



**\$3.00
A YEAR**

**35c
A COPY**

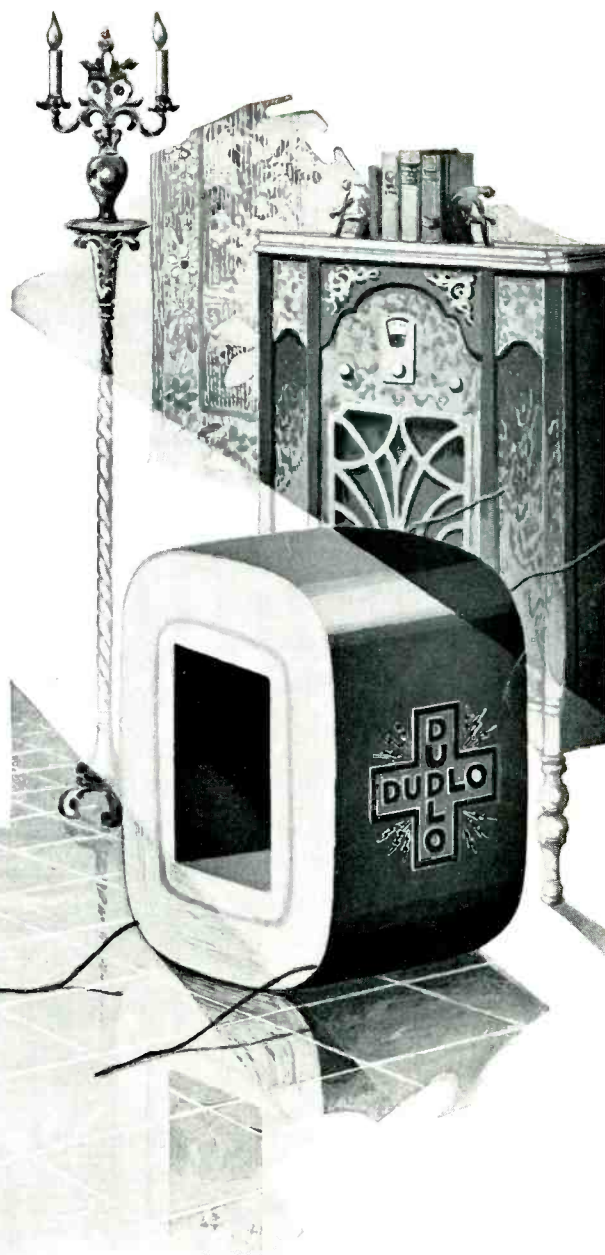
the Coils the thing!

In every radio hook-up an ideal coil is specified for each function in the set.

Each Dudlo coil is backed by its reputation as the utmost in coil perfection, and though tucked away in the chassis of a set . . . forgotten, yet depended upon . . . will give years of faithful performance.

Continuous performance is *assumed*. Tubes may come and tubes may go . . . condensers may break down . . . but the coils must go on forever.

Dudlo coils are superbly engineered, and constructed by experts to fit individual requirements . . . no matter how complex or difficult.



DUDLO

DUDLO MANUFACTURING COMPANY, FORT WAYNE, INDIANA
D i v i s i o n o f G e n e r a l C a b l e C o r p o r a t i o n



Symington Precision Manufacture Begins Here

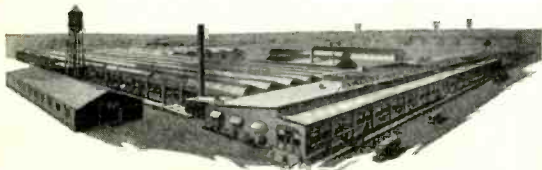
IN THIS modern tool room costly machines, skilled workmen fashion the accurate jigs, tools, dies and fixtures necessary for volume production at low cost. Here begins the precision which distinguishes the Symington product.

This tool room spells quick production on new designs, complete facilities for prompt design changes where a manufacturer's altered specifications so require.

Supporting this tool room is a million dollar plant geared up for large scale production of the Symington Reproducer—a quality speaker at the lowest possible price.

Write for illustrated folder showing this great one-profit plant in detail.

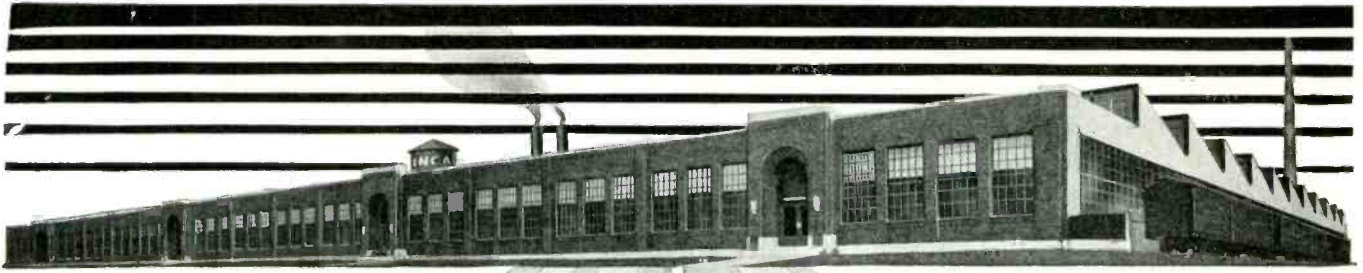
A view of the big Valley Plant. We invite executives and engineers to visit us in Rochester.



**VALLEY
APPLIANCES, Inc.**

*Manufacturers Symington Electro-
Dynamic Reproducers*
ROCHESTER, NEW YORK

Say You Saw It in Radio Industries



Large addition trebling plant capacity under construction

INCA

A REMARKABLE RECORD!

**GREAT FACTORY COMPLETED
PRODUCTION AT FULL SPEED
EXPANSION NOW UNDER WAY
WILL TREBLE PLANT CAPACITY**

A MAMMOTH plant under full power of production. New machinery and equipment built exclusively for the specialized needs of the industry. Copper wire products for the radio, electrical and automotive fields manufactured with consummate skill—under management and engineering seasoned by years of experience.

That's the story of INCA—just 80 days after the first shovel of dirt was turned for the new factory. It is likely that this record, indicating as it does, matchless

Founded by GEO. A. JACOBS
and Associates



ability of performance, is unexcelled in industrial history.

And now comes the announcement of the construction of an addition to the factory, giving floor space and facilities that will treble INCA'S capacity of output! This tremendous expansion is possible because of the exacting and courteous service already given those who have placed their confidence in INCA—growth which competently invites the increasing demands of the trade.

INCA: Symbolic of the best
in the copper wire industry

INCA MANUFACTURING CORPORATION

**COPPER WIRE PRODUCTS
FORT WAYNE, INDIANA**

EASTERN OFFICE: NEWARK, NEW JERSEY + INDUSTRIAL OFFICE BLDG.



*For Radio Sets!
Sound Equipment!
Loud Speakers—*

Here's the *New Socket* *Already Endorsed by Use*

Standard equipment of many leading manufacturers. An *inexpensive* socket that solves the problem—a fool-proof device.

Five different types! Cinch solder coating, bronze contacts, polished bakelite used throughout. Efficient, positive contact on all prongs, easily assembled, soldering accessibility, ideal and practical for flexible production.

Recommended for the requirements of heavy duty, high-powered tubes. If you use a socket, investigate the Cinch.

"Metal Stampings"! Our manufacturing facilities for metal stampings are offered. Same exacting supervised and careful production methods that produced the popular Cinch radio socket are available to radio manufacturers. Already we operate a department for many who had found it more economical. Our organization is one of the largest producers of automobile fasteners; it is highly trained technically and flexible; service is the keynote.

Ask us about the Cinch radio socket or our facilities for metal stampings.

CINCH MANUFACTURING CORPORATION
2335 W. Van Buren Street, Chicago, Ill.

CINCH

RADIO SOCKETS

*To All Tube
Manufacturers*

GILBY SELVAGE MESH



CUT the shrinkage in your production—add to the strength of your product and at the same time enhance its appearance.

Gilby Selvage Mesh is an important improvement in this type screen grid material. A practically solid metal selvage of even surface offers high conductivity with a minimum of transport losses and in addition will lend itself to accurate forming.

NOTICE IS GIVEN THAT WE HAVE APPLIED FOR PATENT ON THIS PRODUCT.

We will gladly supply detailed information on request.

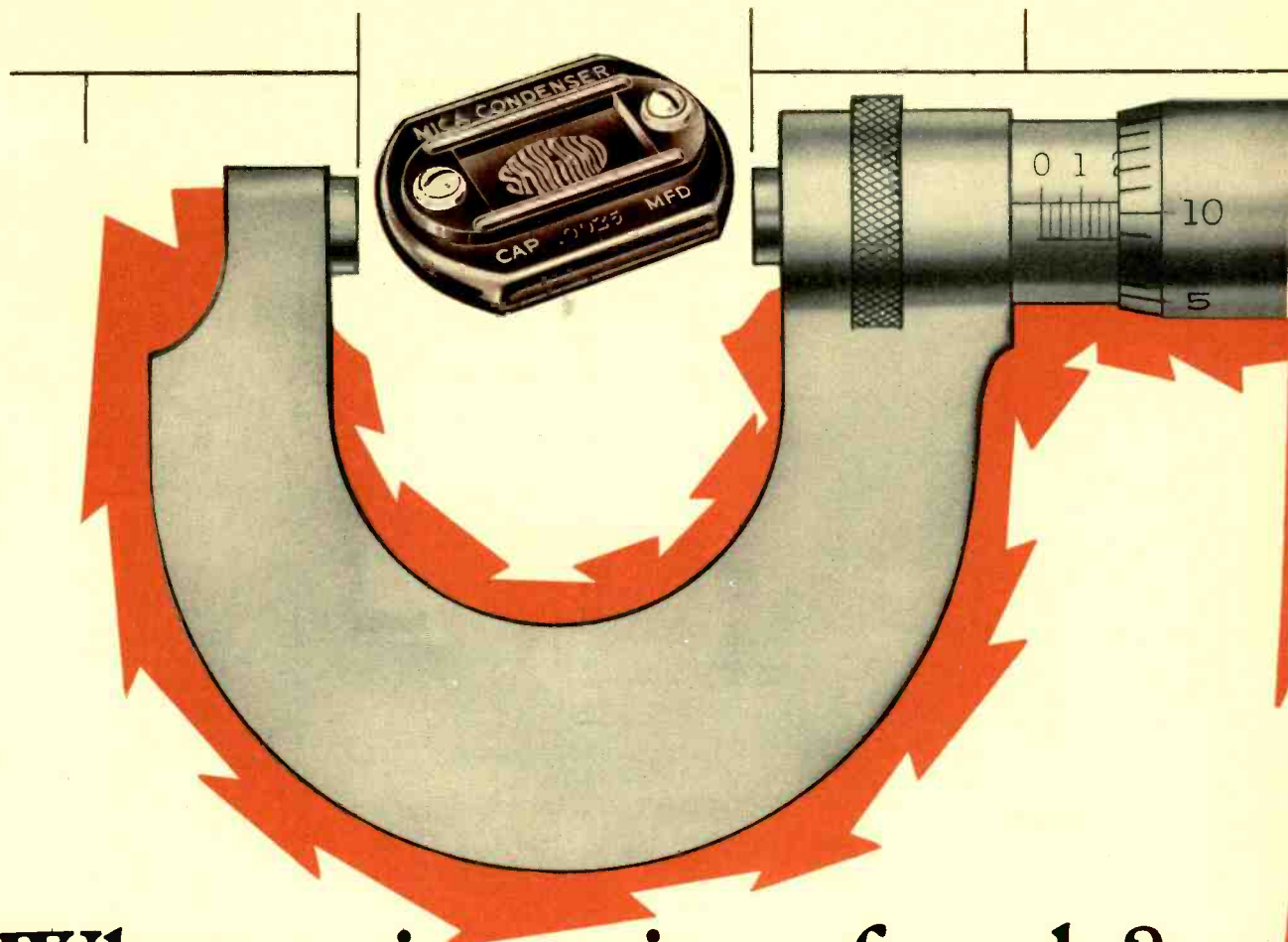


GILBY WIRE COMPANY

Wilbur B. Driver, President
NEWARK, NEW JERSEY



Say You Saw It in Radio Industries



What price micro-farads?

You can buy mica condensers at almost any figure! Your Purchasing Agent can shop around till he finds some source of supply at his own price.

But has he really made a saving?

We have known such "savings" to actually result in ultimate costs totaling several times the price of better condensers—cases where "book" savings meant actual losses.

We have seen several cases where ratings which "didn't mean anything" have kept inspection departments working nights. We have seen production tied up because excessive rejections depleted the stock of usable condensers to a point lower than requirements.

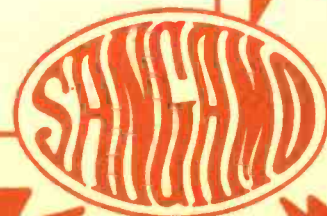
In the imposing list of nationally known radio manufacturers served by Sangamo Condensers, we are gratified by the knowledge that rejections due to inaccurate rating or other causes have been negligible. Buyers have been able to place orders for the quan-

tity needed, without an over-allowance for "rejects."

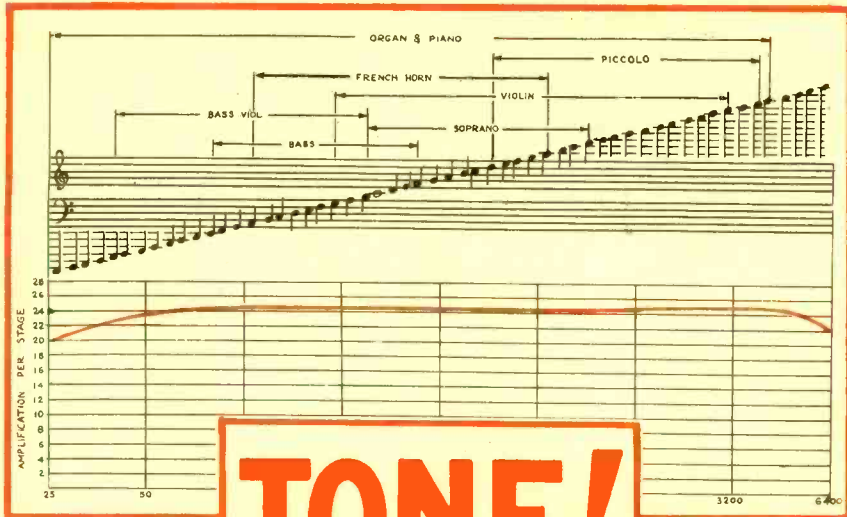
You can rely on the capacity rating of Sangamo—we will let your own inspection department prove it. You can depend upon the reliability of Sangamo as a source of supply, because Sangamo will not open accounts beyond the ability of its already large production capacity. No old customer is ever slighted in order to get a new one!

A case in point

A nationally known manufacturer found mica condenser rejects running in excess of 50%. The specified 5% rating "didn't mean a thing." An emergency order of 8000 Sangamo Condensers showed 22 rejects out of the entire shipment.



See reverse side



TONE!

Curve of Type "A" or Sangamo Straight Audio Transformer showing uniformity of amplification at all audible frequencies.

BETTER Transformers for every radio need!

"X" Line Transformers

- Type AX straight audio amplification list price, \$6.00
- Type BX Push-pull Input unit list price, 6.50
- Type CX-171 Push-pull Output Transformer, for 171 or 250 power output tubes for cone speaker list price, 6.50
- Type DX, same as CX except for 210 and 112 power tubes list price, 6.50
- Type HX Push-pull Output for 171 or 250 Power Output tubes to match the impedance of moving coil of Dynamic loud speakers . . . list price, 6.50
- Type GX, same as HX except for 210 and 112 power tubes list price, 6.50
- Type E output choke to match impedance of the various type power tubes . . . list price, 5.00

"A" Line Transformers

- Similar to X Line but with special core metal to give greater amplification at low frequencies
- Type A straight audio amplification list price, \$10.00
- Type B Push-pull Input Transformer for all tubes, list price, 12.00
- Type C-171 Push-pull Output, for 171 or 250 type power tubes with cone speaker . . . 12.00
- Type D-210, same as C except for 210 and 112 power tubes 12.00
- Type H-171, Push-pull Output for 171 or 250 power tubes for Dynamic Speaker list price, 12.00
- Type G-210, same as type H except for 210 and 112 tubes 12.00
- Type F Plate Impedance for use as a choke to prevent oscillation and for impedance coupled amplifiers, list price, 5.00

PIN THIS TO YOUR LETTERHEAD AND MAIL

SANGAMO ELECTRIC CO., Springfield, Illinois, U. S. A. Dept. 35

- (For manufacturers) I am interested in engineering data regarding your transformers and condensers.
- (For dealers) Please send data on Sangamo Condensers.
- (For set builders) Please send circulars describing your apparatus and latest audio hook-ups.



SANGAMO Condensers



No item can cost so little and cause so much trouble in a receiver as a fixed condenser. This fact is especially appreciated by the manufacturer with an eye to the service problem. Likewise experience has shown that a fixed condenser is not necessarily a good condenser just because it is moulded in Bakelite.

The immunity to thermal changes and to mechanical damage rendered by the Bakelite enclosure is supplemented in Sangamo Condensers by accurate rating and sound construction of the mica condenser within the Bakelite casting.

The standard line of Sangamo Fixed Condensers leave the factory tested to maximum variation of 10%.

NEW!

Condensers for Manufacturers



While the Sangamo Condensers shown at the top of the page have always been popular with manufacturers, there has been a demand for condensers of the same quality of a size and shape more suitable for factory set design and production. For manufacturers use only we have designed the Sangamo "Illini." The connecting lugs may be bent to any position required without impairing the condenser.

Prices on request

**PROVEN PERFORMANCE
IN 1929**

More than

**56,000,000 Tubes
BOMBARDED**

**WITH
LEPEL
BOMBARDERS**

Lepel High Frequency Laboratories, Inc.
39 West 60th Street
New York City

Manufacturers of Bombarding equipment for every
production and laboratory purpose

Submit your requirement

YOU CAN HIRE A MASTER EXECUTIVE FOR \$1920 YEARLY!

You have a job in selling your product. Beyond that your product must be kept sold.

You can address letters to the various firms on your prospect list. That is a necessary part of your selling program. Most lists available are incomplete. Especially is this true of up-to-date lists of the many executives in each plant, any or all of whom may have the say-so when the question of buying your product comes up. Nevertheless your direct-mail campaign does help materially in lessening sales resistance.

As a further adjunct to your selling job, direct representatives or sales engineers are sent out to make personal contacts with your prospective customers. These men, if they know the facts and figures concerning your product and its application to the industry, can accomplish considerable in making sales for you. A staff of sales representatives scattered throughout the country then is also a necessary part of your selling effort.

Another necessary part of your selling job is Business Paper advertising. Such advertising, continuously month after month, keeps your name before your prospective customers and those whom you count as customers today and would like to retain. This sort of advertising paves the way for the reception of your sales letters. Making your name and product well-known, your advertising gets your salesman a satisfactory reception.

Think of *Radio Industries* as an additional executive on your staff. Reaching out into every plant in the U. S. and Canada each month and read, as it is by every executive with an ounce of buying power, it should be given foremost consideration in your selling plans. The influence of its editorial columns assures equal influence for your advertising message. *Radio Industries* will allot you a page space for your message every month for the year for \$160 each issue—\$1920 is the total cost. Why not put *Radio Industries* on your pay-roll to help you with your 1930 selling job. Well, why not?

{ Rate card showing rates for lesser spaces, extra color, special positions and the like will be sent on request. }

RADIO Industries

with which is incorporated Radio Manufacturers' Monthly

520 North Michigan Avenue
CHICAGO



Find Out What This Improved Winding Process Means to Your Product

The extent to which economies or higher efficiencies may be applied in the manufacture of any product involving the use of coils is best determined by actual demonstration of a sample coil, built by Rome.

There is a wide variety of Rome Precision Coils for any purpose; accurately made to exacting specifications.

Through a higher factor of space utilization, as well as increased accuracy of turns, the Rome Winding Process adds far-reaching advantages to Rome Precision Heavy Wire Coils.

Your product may be benefited most by increased coil dependability. Or

smaller over-all coil dimensions. Or greater accuracy of measurements. Or positive uniformity—higher thermal efficiency—lower watts-loss.

In some degree, all of these refinements will undoubtedly improve your product. The sum of them all produces results so important that you will unquestionably find them worth investigation, whatever your present source of coils may be.

ROME WIRE COMPANY
Division of General Cable Corporation
R O M E , N E W Y O R K

ROME PRECISION COILS

Say You Saw It in Radio Industries

Published by
RADIO INDUSTRIES CORPORATION

Chester A. Darling
President

Thomas Liddell
Vice-President

Hugh C. Frisbee,
Secretary-Treasurer

RADIO Industries

With which is incorporated Radio Manufacturers' Monthly

**PRODUCTION
ENGINEERING
DISTRIBUTION**

**RADIO
TELEVISION
SOUND PROJECTION**

VOLUME IV.

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RADIO INDUSTRIES

520 North Michigan Ave.
CHICAGO, ILL.
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CHANGE OF ADDRESS. Instructions for change of address should be sent to the publisher at least two weeks before the date of effect.

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MONTHLY CHATS

The radio industry is becoming stabilized. Proof of this is found in the utter lack of "follow the leader" when it recently became necessary for set manufacturers to determine whether or not list prices should be reduced. Not so long ago, RCA set the pace. As they brought out new models or made price changes, so did the whole industry. This is not true any more. So many manufacturers have built up public acceptance and strong merchandising organizations through years of honest, conscientious effort that they are now leaders in themselves.

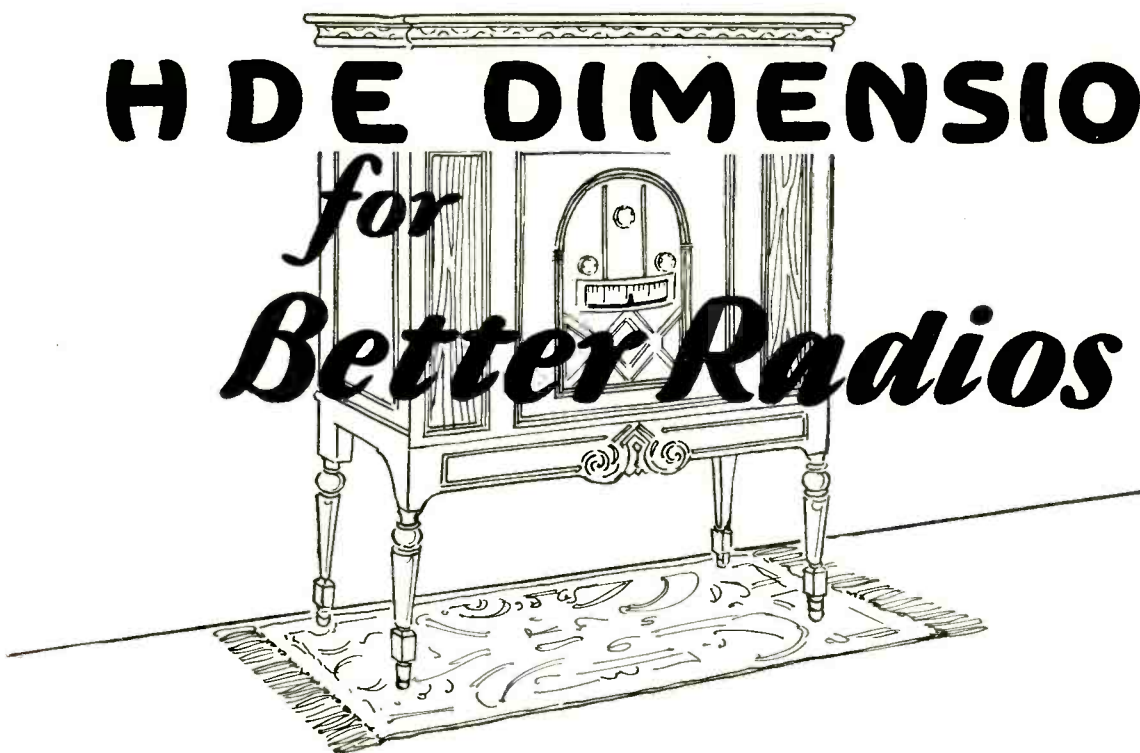
The list prices of radio sets just prior to the general reduction among many manufacturers were extremely fair. Based on production and sales costs, as we know them, there seems to be no justification for cut prices. The consumer was making no complaint. Most sets are bought on deferred payment plan anyhow. We very much fear that the public will hold off buying now, awaiting further reductions. And how about the jobber and dealer? Their net receipts under the new price schedules will not pep them up to any extent.

Typical of announcements sent out by manufacturers, who did not fall in line for price reductions, is this one which was mailed to all jobbers by American Bosch Magneto Corporation: "This corporation is not contemplating any reduction in radio list prices. In making this decision, we have taken into consideration all present market factors and have your own and your dealer's best interests at heart. We believe much can be gained by avoiding any precipitate action at this time in connection with stable merchandise and policies such as are expected from the Bosch Corporation." Letters in a similar vein, and based on the same thought of stabilized business, were sent out by such leaders as Sparton, Edison, Temple, Zenith, Philco, Grebe and several others. More power to all of them!



H D E DIMENSION

for Better Radios



NO LONGER do radio and furniture manufacturers have to worry about the problem of increased production. Their greatest problem—how to get necessary lumber parts without maintaining a large inventory—may now be solved through the use of HDE DIMENSION which enables them to meet peak months and seasons without any additional expenditure for machinery and space.

In addition to this they effect a substantial saving in many different ways. HDE DIMENSION eliminates waste, cuts labor and overhead, reduces freight costs and does away with storage.

Manufactured from HDE cured lumber, accurately kiln dried by a process outstanding in its superiority, it comes to you ready for final finishing and assembly.

The mark of HDE, your guarantee of lumber excellence, is on every stick.



READY TO ASSEMBLE

Hillyer Deutsch Edwards, Inc.
Oakdale *Hardwoods — Pine* Louisiana

Branch Offices: CHICAGO, 223 Railway Exchange Bldg.
DETROIT: 7-252 General Motors Bldg.

EDITORIALS

A couple of years ago, it was Colonel Lindbergh, the intrepid aviator who flew from Long Island to France.

A NEW HERO—THE SERVICE MAN

Today, the hero of the hour is the radio service man, whose praises are being sung high and low, who is being showered with honors on all sides, and to whom entire publications are being devoted.

During the past year, several erstwhile radio consumer magazines have changed over to the service man. Several new service publications have appeared. Several organizations have been founded, catering to the service man. Many books have been written on radio servicing. Correspondence and resident schools have offered to turn out more service men for the future of radio.

Of course the radio service man is an important factor in the present and future of our industry. Let us hope, however, that he takes all this hero-worshipping, and continues to handle the hard work of our industry, emulating the conduct of that other young man who winged his way across three thousand miles of ocean waste.

Of course there is no over-production this year. Every manufacturer we have approached on this subject, violently maintains in the face of all arguments that he is not over-producing, and that everything he is producing is being sold. Still, there is more over-production this year than ever before. Once again, a production out of all keeping with the potential market, must be dumped in large measure at prices which do not spell a fair return. We agree with manufacturers that everything produced is sold, but the question is, for how much profit? Any-one can produce goods and give them away.

The radio industry, as is true of many other industries since the frantic production days of the World War, has tremendous production facilities. Also, the temptation is to use the production facilities to the utmost, even working two shifts and three shifts, because the overhead tumbles so rapidly when the working day is extended. But with many homes now provided with satisfactory radio sets, it must be obvious that our market is tightening up steadily. We must get back to a normal production schedule, which will be big in profits rather than in numbers.

It is gratifying to note the large number of radio manufacturers now sponsoring radio program features. In the case of the radio manufacturer, there is a two-fold object accomplished by broadcasting good programs, namely, first, the publicity value which

is a valuable adjunct to other forms of advertising; secondly, the discharge of a moral obligation. Obviously, the radio industry is built up on the foundation of broadcasting. Therefore, that industry must contribute at least a fair share, if not everything, to the maintenance of that structure.

AN OBLIGATION DISCHARGED

We are proud of the excellent showing of many of our radio manufacturers in present broadcast offerings.

With the confirmation of the entry of the General Motors Corporation into the radio field, the industry is engaged in wholesale speculation as to what it is all about. No one will gainsay the size, power, wisdom and ability of that huge organization. However, it is also equally obvious that radio is quite different from automobiles.

After all, the automobile manufacturer has things pretty much his own way when it comes to distribution. With no end of individuals to try their luck at the automobile sales game, the manufacturer is on the heavy end of the supply-and-demand see-saw, and can just about dictate terms. Consequently, the manufacturer decides who will handle his products, how many, on what terms, and so on. He even steps in and looks over his dealer's books, and decides how the business should be run. He ships a carload or trainload of cars to the dealer, who must take them, say nothing, and cough up the money. As to whether there is a demand for automobiles or not in any given territory is purely the dealer's funeral. The manufacturer has, indeed, built up a clientele of dealers. That is his market. As for the public—well, that is the dealer's end of the story.

All of which sounds quite strange to radio ears. This year, dealers and jobbers are dictating terms. Manufacturers are frantically trying to please their merchandisers. And that is the situation into which the General Radio Corporation now steps, with what results, we shall soon see.

AUTOMOBILES VS. RADIO

Before the next issue of RADIO INDUSTRIES goes to press the Christmas and New Year holidays will have come and gone. We take the opportunity, at this time, to wish each one of our readers a very Merry Christmas and a happy, most prosperous New Year. To help achieve stabilization and prosperity for the Industry in the New Year will be the aim and recognized duty of the editors.

THE SEASON'S GREETINGS

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A Survey of Radio Merchandising

*A Discussion of the Job of Selling Wherein Several Prominent
Manufacturers Voice Opinions*

By C. A. DARLING

Editor

SHOES are made in Massachusetts. Automobiles are made in Detroit. Moving pictures are made in Hollywood. These and other industries have taken unto themselves certain cities or localities, best suited to their needs. Some of their needs are general. Factories must have coal and transportation facilities. Some of their needs are special. Shoe factories must be near the leather and wood markets, automobiles near the steel markets, moving pictures near natural scenic effects. And there are the needs having to do with outlets. Where do the goods go after they leave the factory, the studio, the mill? If to Europe, the Atlantic seaboard. If to this country, a central location, perhaps the middle west, Chicago.

Many large industries, having studied these problems, as applied to their own cases, have formed centers. It has resulted in many economies, of which cooperative buying and distributing have not been the least important.

The radio industry, on the other hand, remains decentralized. Perhaps because it is still young and has not yet been able to settle problems bearing on centralization. Perhaps because the industry is divided into two parts—that branch which manufactures parts, and the branch which assembles the parts into sets. We do not wish to alarm our readers unduly. The problem of centralization versus decentralization is not acute. But it remains nevertheless a problem. Since it is not acute we can afford to meet it leisurely, taking into consideration all the factors, and arrive at a logical conclusion. Not that we shall arrive at such a conclusion in this article. We wish merely to discuss one of the factors. Later we may discuss others, such as the buying of parts, raw materials, production methods, markets, transportation. In the present article we will consider a problem both bearing on the general theme of centralization and at the same time of acute interest to the radio industry as at present conducted. The problem is that of merchandising.

We sent out a questionnaire consisting of seven questions to more than a hundred leading radio manufacturers throughout the country. We received many

replies, expressing in many cases opinions of a contradictory nature. These we have compiled with a view to giving each manufacturer the benefit of the views of his competitors, which he will find, very often, to be at variance with his own.

Perhaps the largest single merchandising problem concerns distribution, as it affects both the jobber and the dealer. Tackling the jobber first, we find that his complaints derive from two sources, he fears manufacturer to dealer and consumer merchandising, and he dislikes competition from other jobbers in his territory. He feels, and many manufacturers agree with him, that maximum cooperation and merchandising effort can be obtained if the manufacturers deal exclusively with the jobber, each jobber having exclusive rights in his territory. That many manufacturers agree with him is shown by the fact that about half of them sell exclusively to jobbers. But they are disinclined to use the same

IN the job of merchandising, the radio manufacturer can learn considerable from the past experience of the automobile industry. Too many new models cause the public to continually hold back, always waiting for the ultimate of perfection. After all, the dealer is the man on the firing line and the manufacturer will do well to listen attentively to the dealer's point of view and work more closely in harmony with him.

methods for merchandising tubes and accessories. The A-C Dayton Company distributes to jobbers only, except in New England. On the other hand, there is the argument against such exclusive distribution, based on the fact that the large retail organizations such as chain stores and independent department stores are rapidly getting away from such methods. The Radio Products Corporation voices the opinion that an exclusive right to anything tends to encourage the representative to in-

activity. Competition is the life of trade. Personally we believe this proverb to be out of date. It has seen good service but it is growing threadbare and should be discarded, using the word *cooperation* in place of competition. But that is just our opinion. The sales structure of one company consists entirely of dealers except in Colorado and west, in which sections it sells to jobbers. In both cases exclusive distribution privileges are given, provided the agency is large enough to do a good job in its particular territory.

Although the manufacturers seem willing enough to deal exclusively with the jobber, and give him the advantage of exclusive representation in his territory, he seems unwilling to play the same game with the dealer.

The belief predominates that the dealer would not do the line justice without local competition, because such exclusiveness cannot be controlled, and because manufacturers have found it better to select dealers on the basis of merit in individual cases and territories. We suggest, however, that dealers of merit might come to the fore if they thought they would have the benefit of exclusive rights. Playing one against the other breeds only dissatisfaction. A. H. Grebe & Company, Inc., has found, however, that in small towns greater sales have developed through exclusive dealer outfits. In metropolitan centers, on the other hand, the same company finds that, so long as dealers are not crowded too close together, greater sales develop from open dealer territory. One organization feels that exclusive dealer distribution is a question that should be optional with the distributor who appoints the dealers, inasmuch as he will be required at times to give exclusive territorial rights to large radio outlets in order to secure their business.

If the manufacturer withholds from the jobber and dealer the benefits of exclusive rights he must protect his outlets in other ways. The most obvious method is by price maintenance, and the exercise of every precaution on the part of every manufacturer to prevent his line from being obtainable by the public at the dealer's or jobber's discount.

Most of the concerns protect the jobber and dealer by careful selection to prevent their sets from falling into the hands of price cutters, and by refusing to sell from the factory except by arrangement with the jobbers. When, because some territories are not covered, the manufacturer sells direct to the consumer, he charges the list price C.O.D. Some manufacturers selling only to jobbers, make the further stipulation that the jobbers sell only to dealers, and only to such dealers whose franchises are approved by the manufacturer. This protects the consumer as well, in matters of installation and service. Courtesy discounts are discouraged but are very hard to control.

Not only are most of the manufacturers agreed that the jobber and dealer must be protected in the matter of discounts; they have likewise agreed as to what those discounts shall be. In fact their opinions coincide on this subject as on no other. Jobber discounts ranged within the rather narrow confines of 50% and 60%, with only one instance of the latter and most concerns allowing 50% and 10% off. The discount to dealers ran from 40% to 40% and 10% and 5% off, with most manufacturers giving 40%.

Automobile manufacturers are realizing the eventual folly of announcing each yearly model as biggest and

best, causing the public to buy, and coming out the following year with a bigger and better model, to make the owner of last year's model appear old-fashioned. They are coming around to the point of advertising the lasting value, both mechanical and stylistic, of their cars and the protection they afford purchasers against undue obsolescence. Such an attitude is even more important in the radio industry, since a receiver cannot readily wear out. Mechanically, the receiver has reached the point where the manufacturer cannot conscientiously ask the public to replace its sets every year. Fortunately, radio manufacturers are seeing the light and are protecting dealers and jobbers against obsolescence and liquidation sales. All, that is, except Thomas A. Edison, Inc., whose skepticism is again brought to the fore, by their belief that it is impossible to protect the jobber and dealer unless the manufacturer works on an excessive margin. But most of the other companies try to help in one way or another. Some treat the problems as individual cases, acting in accordance with the cooperation and activity which the jobber or dealer has shown in the past. Some of the general practices are protecting price decline, checking the stocks of jobber and dealer and limiting production so as not to overload the jobber and dealer with merchandise. Some manufacturers will allow no price cutting under any conditions. Others, following the trend of several automobile manufacturers, make improvement changes in their sets without resorting to yearly models. This also protects the consumer against what might otherwise be a year's obsolescence after only a few months, as in the case of purchasing a receiver several months before the new model comes out. It also tends to the incorporation in receivers of new improvements as soon as they are proved worthy, instead of withholding them until the next yearly model. Other firms allow no liquidation until they are certain that no dealers or jobbers are still carrying their sets at regular prices. There is also the practice of issuing 60-day price guarantees. One manufacturer, in his distributor sales agreements and dealer franchises, stipulates that any merchandise, made obsolete by newer models, may be returned within a given time limit after the marketing of the new models.

Another angle of merchandising concerns the relative merits of supplying the jobber and dealer with vacuum tubes which the manufacturer has found most satisfactory in the operation of his receiver, or of allowing the jobber and dealer to buy tubes directly from the tube manufacturers, with the subsequent recommendation by the dealer for use in the set of that make of tube which he finds most profitable to handle, which may or may not be the one best suited to the set.

Those manufacturers who leave the purchase of tubes entirely in the hands of the jobber and dealer, do so because they believe that since tubes fall within the limit of certain standards, not controlled by the radio manufacturer, they should not be furnished to the jobber and dealer by the set manufacturer. Also, since their delicacy is such as to require much skill and patience in manufacture as well as contact and maintenance in the field, tubes should be handled by the radio tube companies. Unless, of course, the set manufacturer also manufactures or controls the manufacture of the tubes supplied, in which case he could ship them with the

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Radio in Foreign Trade—II

A Study of Populations, Wealth and Buying Habits of Foreign People Which Should Be Helpful in Selling Radio Products Profitably

By J. A. RIVERA

IN my first article which appeared in the October issue of this publication the general subject of exports were discussed. In the following series we shall outline the principal markets for radio products, classifying the various countries into five grand divisions,—the Americas, Europe, Africa, Near East and Far East.

The countries of the American Continent are of more general interest, and it is perhaps advisable to begin with them. Since Canada is considered by many manufacturers as part of the domestic market, we shall omit any detail regarding the Canadian market other than to state that during 1928 radio products to the amount of \$3,682,929.00 were sold in Canada.

Mexico is one of the leading markets for American products, and is one which the American radio manufacturer should cultivate intensely, not only because of its nearness but also because of the natural tendency of the importers of that country to look to the United States for their electrical materials. An additional reason is that the Mexican has learned to appreciate the quality of American products, and will invariably insist that the article he is buying bear the trade mark "Made in the U.S.A."

Mexico City is the distributing center of the country, and there the leading importing firms are located, although many independent retailers in some of the larger cities, such as Tampico, Guadalajara, Vera Cruz, Chihuahua, Puebla, Merida, and others, buy direct from the manufacturer, and in addition many of these retailers purchase large quantities from wholesale houses situated on the American border. In many instances local dealers in these cities demand the exclusive agency for their state, and in the writer's opinion this is a point of equal interest to the American exporter and to the buyer.

Mexico has a population of about 15,000,000, and an area of some 750,000 square miles, its principal cities being those mentioned in the preceding paragraph. It has a temperate climate, although both coasts and the southern part of the country are semi-tropical. The electric current most generally in use is alternating, 110 volts, 60 cycles, although in some cities both direct and alternating current are used. Latest reports show there are seventeen broadcasting stations in the country. In 1928 the United States exported to Mexico radio products to the amount of \$224,255.00.

The Central American countries (Guatemala, Honduras, British Honduras, El Salvador, Nicaragua, Costa Rica, Panama, and the Panama Canal Zone) have a total population of 6,600,000, and an area of 196,000 square miles. In these tropical countries radio reception is difficult at certain seasons of the year. The principal cities are Guatemala City, Belize, San Salvador, Tegucigalpa, Managua, San Jose, Panama City and Colon. There are only about five broadcasting stations in this

entire region. During 1928 we exported to these countries a total of \$72,045.00 in radio products, Panama being the largest individual purchaser.

In the West Indies, Cuba is by far the most important market. This island has a population of 3,500,000 and an area of 45,000 square miles. The principal cities are Havana, Santiago, Cienfuegos, Matanzas, Camaguey and Cardenas. There are some fifty broadcasting stations on the island, the majority of which are located in Havana.

The purchasing power of the Cubans is probably the highest of any of our southern neighbors, and the close political, economic and social relations existing between Cuba and the United States make the island one of our leading markets, in proportion to its population. During 1928 Cuba's purchases of radio products in the United States amounted to \$232,291.00. Perhaps a more accurate idea of Cuba's importance as a market may be gained by comparing this total with the sum of \$224,255.00 which we exported to Mexico,—a country which has approximately five times the population of Cuba.

NEXT to Canada, perhaps South America is the best export territory for the American manufacturer. A study of the buying habits and wealth of the various South American countries, together with various figures are presented in this article by Mr. Rivera. The South Americans are large consumers of manufactured articles and certain radio manufacturers who have done business there have found it very profitable.

The Dominican Republic, comprising half of the island of San Domingo, has a population of 1,000,000, and an area of 20,000 square miles. The principal cities are Santo Domingo, San Pedro de Macoris, Puerto Plata, and La Romana. This country imported a total of \$49,325.00 in transmitting apparatus, accessories, and radio sets during 1928. There is but one broadcasting station in the country, and the current in use is alternating, 60 cycles, 110 volts. Haiti, the other half of the island of San Domingo, has a population of 2,500,000 and an area of 10,000 square miles. The principal cities are Port-au-prince, Gonaives, and Cape Haitien. French is the language of this country, and about nine-tenths of the inhabitants are negroes. This is one of the most backward countries in the American hemisphere, and radio is an undreamed-of luxury to the majority of the people.

Porto Rico, an American possession, has a population of 1,500,000, and an area of 3,500 square miles. The principal cities are San Juan, Ponce, and Mayaguez. As a rule, importers in Porto Rico request exclusive franchise for any article they are handling. Porto Rico should be treated really as one of the States, for the American rules and regulations governing radio are in effect there. Alternating current of 110 volts, 60 cycles, is general, although there are some exceptions in the smaller towns.

The British West Indies, taken as a whole, are important enough to warrant some space in this article and will be treated as one country. The inhabitants number about 1,500,000, the majority of whom are negroes whose buying power is very low. During 1928 the United States exported some \$40,000.00 worth of radio sets, parts, tubes, etc., to the various islands in this group, of which amount the Bermudas and Jamaica probably took the larger part. The principal cities are Bridgetown, Barbados; Hamilton, Bermuda; Kingstown, Jamaica; Nassau, Bahamas; and Port of Spain, Trinidad. English is of course the official language of this group of islands.

Argentina is one of the most important markets for American products. It has a population of 10,000,000, and an area of 1,150,000 square miles. The principal cities are Buenos Aires, Rosario, Cordoba, Santa Fe, Tucuman, La Plata, Mendoza, and Bahia Blanca. An important feature of this country is the fact that about one-sixth of the total population live in these cities, and Buenos Aires itself has about one-fifth of this total. Argentina's purchases of radio products in the United States during 1928 amounted to \$1,513,693.00 which represents about 13% of our total exports of this class of goods in that year. There is some manufacturing of radio sets in Argentina, and British and German products are also in use, although American sets are the most popular and are in the majority. A conservative estimate as to the number of radio sets in use in Argentina would be around 700,000. Local dealers purchase their supplies from importers, or through manufacturers' representatives, but the majority of the large retailers in Buenos Aires purchase direct from the manufacturer. Rosario is an important outlet not only for the northern and western sections of the country, but also for Paraguay, and should be given careful consideration when the subject of exclusive franchise comes up. There are twenty-two broadcasting stations in Argentina, of which number fifteen are in Buenos Aires. The majority of the cities in Argentina use direct current, and the voltage is 220, although Buenos Aires is provided with both direct and alternating current, 220 volts, 50 cycles.

Brazil, with its 30,000,000 inhabitants and an area of 3,286,000 square miles, is gradually forging to the front as one of our most important markets. Its two principal cities are Rio de Janeiro, population 1,500,000, and San Paulo, population 600,000 although there are numerous cities ranging in population from 50,000 to 250,000, such as Recife, Belem, Para and others.

The average purchasing power of the Brazilian is not very high, but with the entrance of American manufacturers, notably Ford, into the country, it is natural to expect that it will increase with the years. During 1928 we exported to Brazil \$432,524.00 in radio products, about one-fourth of this sum being for transmitting sets and parts.

German, French, British and Italian radio sets are also imported into Brazil, and in entering this market the American manufacturer should bear this fact in mind, as it is a factor that makes the price of the article more important than its quality, although this latter should not be neglected. Brazil has fifteen broadcasting stations, and unlike most of the other South American countries, where the majority of the stations are located in the principal city, its stations are evenly distributed all the way from the northernmost point to the southern boundary—from Manaus to Porto Alegre. Voltages of 110, 120, and 220, direct and alternating current, 50 and 60 cycle frequency, are supplied in various combinations.

Chile has a population of about 4,000,000 and an area of 290,000 square miles. Santiago, Valparaiso, Concepcion, and Antofagasta are the principal cities. Chile has eight broadcasting stations. Alternating current, 50 and 60 cycle frequency, and 110 and 220 volts, is in general use. Chile's purchases of radio products in the United States during 1928 amounted to \$77,604.00.

Bolivia has a population of 3,000,000, and an area of some 800,000 square miles. The principal cities are La Paz, Cochabamba, Paton, and Oruro. Radio is still in its infancy in this country, and the buying power of the average Bolivian is too low to permit of general distribution, although there is a limited market.

Colombia has a population of 7,300,000 and an area of 500,000 square miles. The principal cities are Bogota, Cartagena, and Barranquilla. During 1928 the United States exported to this country in radio products the sum of \$71,022.00. A broadcasting station was established by the government this year.

Ecuador has a population of 2,000,000 and an area of 118,000 square miles. The principal cities are Guayaquil and Quito. A majority of the inhabitants are of Indian or Negro blood. Radio has made little progress here, as shown by their total purchases during 1928 in the United States amounting only to \$6,183.00. The purchasing power of the natives is very low.

Paraguay has a population of about 800,000 and an area of 200,000 square miles. The capital and principal city is Asuncion. There is but one broadcasting station in Paraguay.

Peru has a population of 5,500,000 and an area of 535,000 square miles. The principal cities are Lima, Arequipa, Trujillo, Mollendo, Chiclayo, and Callao. There is only one broadcasting station in the country. Peru has always been a good market for American products, and radio will probably make giant strides in the next few years, although during 1928 we exported to this country only \$13,876.00 worth of these goods. Distribution is attained through the large importing firms in Lima, which generally require the exclusive representation for the entire country.

Uruguay has a population of 1,750,000, and an area of 75,000 square miles. This is a very important market, in spite of the country's small size, and should be given proper attention. For one thing, it is one of the most advanced countries in the world—economically, socially and politically. There are fourteen broadcasting stations in Uruguay, twelve of them being located in Montevideo. Our total exports of radio products during 1928 to Uruguay amounted to \$244,309.00,—an important figure when considered in connection with the sum of \$432,-

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The Safety Use of Conveyors in Radio Plants

Mechanical Handling of Products Cuts Costs and Accidents

By W. DEAN KEEFER

*Director, Industrial Safety Division
National Safety Council*

IN a few years the radio manufacturing industry has grown from an infant to one of the greatest of our manufacturing enterprises. This industry started off with the advantage of being able to utilize the latest developments in factory economy. As with all new and rapidly growing industries, production often has multiplied so fast that many adjustments must be made.

Even the large plant must often be doubled in capacity or new units must be added. Quick changes in exact type of manufacture must be made to adapt the factory to unforeseen market demands. The small factory must change from a general product to a specialized product, thus demanding a complete and prompt reorganization of their factory program.

One of the greatest aids in such necessary production changes and also the speeding of production, is the use of conveyors. The increased use of conveyors in the average radio manufacturing plant usually is closely associated with increased volumes and economy of production. This is true in set manufacturing plants, tube manufacturing plants, cabinet manufacturing plants and the production of other radio accessories.

The radio manufacturing industry has had the advantage of being able to study the remarkable development in the use of conveyors in some of our best known automobile plants. In fact, it may be said that the increased use of conveyors in automobile plants has been one of the outstanding reasons why these factories have been able to speed their production so remarkably in the past ten years. In like manner, the increasing use of conveyors in some of our radio manufacturing plants has resulted in remarkable increase in production and in lower unit cost to the public.

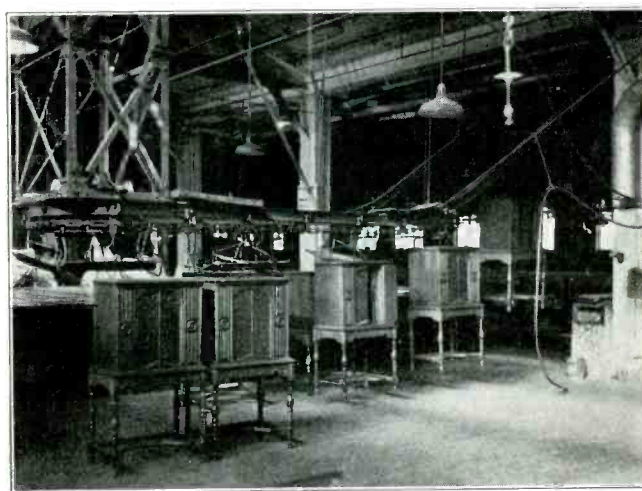
In general, the increased use of conveyors in radio manufacturing plants has had a close relationship to a decrease in certain kinds of accidents. Conveyors usually replace hand labor, and this reduction in the number of workers on a given job naturally tends to lessen the total injuries, through the decrease of man-hours of exposure to accident hazards.

In many operations the use of conveyors will lessen the necessary walking about of employees and the necessary carrying of materials. As stated by an insurance company, in a report which summarized this hazard, the "mechanical handling of products replaces hand carrying and manual labor lifting. It is always the person carrying something who slips or stumbles, and this usually costs the company real money for compensation and loss of time."

The particular company which was the subject of this investigation made use of table belt conveyors for the

assembling of the small parts of their amplifier units, through the use of a so-called "off and on step assembly conveyor belt" down the center of the assembling table. They also used vertical chain packing elevators, and inclined slanted belt lowerers between floors. As a result, as reported by the insurance company, "there is little trucking and very little uses made of the archaic platform elevators, as a material handling device."

In addition to the replacement of hand labor, conveyors have many other values in the lessening of accident hazards. Their use usually tends to reduce fatigue, improve cluttered-up working places, relieve congestion, remove irritating delays due to accidents, and eliminate many other forms of industrial waste closely related to accident hazards.



This picture shows Majestic Cabinets, in the Grigsby-Grunow Plant, ready for the drying conveyor. This takes about 45 minutes to complete the trip to the unloading end

On the other hand, the use of mechanical conveying systems introduce special hazards which must be continuously watched. As a basic rule for safety with conveyors, no adjustments or repairs of any kind should ever be made while a conveyor is in motion. It is advisable that all oiling of conveyor equipment should be done when the machinery is not in motion, unless the equipment is provided with pressure oiling and greasing devices or other protection which relieves the oiler from coming into dangerous proximity to moving parts.

This hazard exists even for the narrow conveyor belts so largely used in the assembly rooms of radio manufacturing plants. Every person in a plant who is authorized to repair or control operating conveyors should be provided with a lock for holding this machinery

in check until repairs are made. *There should be a plant rule forbidding anyone to remove a lock or a warning sign, except the person who placed it.*

In case of long conveyors, possibly running through two or more rooms, there should be a number of control switches for checking the machinery to meet emergencies. There should be some sort of warning gong or whistle to give general notice before the starting of the conveyor belt.

Conveyor belts have many splendid advantages and, comparatively, have few hazards. They are smooth and noiseless in operation, and belting materials have been so improved lately that they may carry quite large units. They have the advantage also of carrying packages in opposite directions simultaneously, and pieces may be easily diverted to the side at any point.

Such belts, when provided with cleats or arms, may be adapted for the carrying of rather heavy packages up inclines almost vertical.

Vertical conveyors or spiral conveyors, from one floor to another, bring a new kind of fire hazard. There are two chief methods for the elimination of this hazard. One is to enclose the chute in a tower of steel, concrete, or masonry. The other is to provide fire doors (draft checks) where the chute passes through the floor. Floor conveyors of course always should be well guarded with suitable railings and toeboards to protect workers from stumbling into them. Regular places should be provided for crossing such conveyors, which can be adequately protected.



Showing unloading table where speakers are received from conveyor in the Dickens Avenue plant of Grigsby-Grunow Company

Gravity roller conveyors are much used and provide very economical transportation of material, through the use of the rollers which revolve when the material is placed upon them. The chief hazard in the use of roller conveyor equipment is the danger of the material running off the edge of the rollway and falling to the floor. A guide or a guard railing is often provided on each side of such roller conveyor ways, and such guards are especially advisable at corners and turns, and on elevator conveyors where men must work or pass beneath.

One insurance company indicates that a large percentage of the accidents which are reported in connection with conveyor equipment are the result of materials falling from such conveyors and striking persons beneath.

There is always a hazard in power driven conveyors which have parts in which a person might become caught. This equipment should be guarded with enclosures or railings.

The general hazards relating to the use of conveyors have been summarized in a Safe Practices Pamphlet on "Conveyors" published by the National Safety Council. In addition, a safety code for conveyors and conveying machinery is being worked out under the auspices of the American Standards Association by the American Society of Mechanical Engineers and the National Bureau of Casualty and Surety Underwriters as sponsors.

They state as their problem the "safe operation and maintenance of gravity, belt, chain, flight, bucket, apron, screw and digging conveyors, car hauls, serial cable ways, overhead trolleys and pneumatic tubes."

This list includes, of course, a study of the different types of conveyors and combinations of types which have been adapted in radio manufacturing plants.

This study, toward the working out of the National Safety Code for Conveyors and Conveying Machinery, is being made by twenty-eight different groups and organizations. These include the American Society of Safety Engineers, the International Association of Government Labor Officials, the International Association of Industrial Accident Boards and Commissions, the National Association of Mutual Casualty Companies, the National Fire Protection Association, the National Safety Council, the National Electrical Manufacturers, the Society of Industrial Engineers, the U. S. Bureau of Standards, the U. S. Department of Labor and other organizations.



BETTER RECEPTION NEEDED

"Return of favorable radio reception conditions," declares Alfred H. Grebe, pioneer radio manufacturer, "indicates that with the utilization of the screen grid tubes possessing such high amplification factors, the Federal Radio Commission has still a considerable problem before it in completing the re-assignment of stations so that heterodyning may be further reduced, if not eliminated. Scores of stations of comparatively weak power are now coming through.

"Stations quite far apart simultaneously using a common wave length are noticeably clashing. It is clearly evident, therefore, that the use of screen grid tubes necessitates further revision of the wave length assignments in the interest of listeners who like to tune in for many stations.

"No station should be permitted to continue on the air, spreading its signals to all quarters during the winter months and easily picked up by the new and much more sensitive receivers, without manifesting a fair degree of public service by its programs and justifying a right to permanency.

"Of course, with so many channels that are cleared or semi-cleared, a wealth of entertainment is to be had without interference. The finest programs come over the cleared channels. That of course minimizes the seriousness of the general situation, but if we are to reach the ideal status of affairs the heterodyning on other lanes should be curtailed, in so far as possible. The Commission, of course, is cognizant of these facts and studying the entire broadcast picture with care and a sense of fairness to all."

What Price Indifference!

The Jobber Can Help the Dealer but the Dealer Must Be Willing to Help Himself

By *PETER SAMPSON*
Pres. Radio Wholesalers Assn.

A RADIO distributor whom I know very intimately, recently developed a plan which he believed would stimulate business and sell merchandise for his dealers. The plan necessitated the preparation of certain printed matter and other material at an expense of several thousands of Dollars—which the distributor paid for.

This material was mailed by the distributor, at his own expense, to people whose names were furnished by various dealers. The only thing that any dealer had to do who wished to take advantage of this cooperation, was to furnish a list of people to whom he had already sold radio receivers.

The plan was then presented to these people as coming from that particular dealer, and the only cost to the dealer himself was the time it took to make up a list or a partial list of his satisfied customers. One would think that an idea that was designed primarily to make money for the dealer and came to him absolutely without cost and was put into execution without causing him any work or trouble, would elicit a unanimous response from any class of dealers to whom it might be presented.

Here are some interesting figures:

The distributor had approximately 1,200 dealers selling the radio set he handled.

The plan was presented to each of these 1,200 dealers by letter. Within a week after this letter had gone out it was followed by another, because the distributor wanted to make sure that every dealer would know about it.

A sales force of twenty-six men talked about the plan to these dealers as they called on them and offered to sit down themselves and prepare the mailing list for the dealer if he would only bring out his records for them to work from.

All this promotional effort resulted in 200 dealers out of a total of 1,200, responding with the necessary information and an expressed desire to accept the proffered help.

Let me tell now what happened:

It is Thursday as I write this. On the preceding Saturday the material as prepared at the expense of the distributor was mailed to the people as shown on the lists furnished by the various dealers.

This morning, the fifth day after the mailing, I am informed by the distributor's sales manager that one of the dealers phoned him of his own volition to tell him he had already actually made and closed twenty sales because of the plan, and also that five prospects had come into his store today, each of whom he expected to close within the next twenty-four hours.

The moral I draw from this true story does not surprise me. It merely offers another explanation as to why so many dealers spend their time complaining about busi-

ness being bad, and eventually pass out of the picture, laying their failure to bad times, chain store competition, or what have you!—Never their own indifference.

One would suppose, and with reason, that the man who had invested his capital and time in an enterprise, would have no hesitancy about making a serious effort to utilize that time to maximum advantage.

The fallacy of that theory lies in it being necessary, in order to carry it out, to exercise the brain and therein is the crux to the whole situation. Of all the parts of the human anatomy it is the one least used.

An analysis of a given number of radio dealers will show a certain percentage of successful ones. When you look for the reason for that success you find invariably that dealer is thinking. He thinks first about the connections he wants to make and the merchandise he wants to sell. He aligns himself with distributors and manufacturers who have demonstrated their responsibility and stability and a sincere willingness to give him every aid and assistance possible. He picks honest merchandise, honestly priced, which he can sell at a profit because of the good will and consumer acceptance that has been created for such a product. That does not necessarily mean he sells the product on which he gets the longest discount or the most free advertising, etcetera. He thinks for himself and finds he cannot make money by splitting his effort over too wide a field, and as a consequence, he limits the number of lines he carries, and thereby reduces his inventory investment and increases his chances for *Profit* through turnover.

He is so busy devising ways and means to promote sales that he hasn't time to notice that "business is bad." He works hard all the time but he puts on extra steam when sales are harder to make. He can always find business, because if it won't come to him he puts his brain to work and thinks up a method of going out and getting it. He may spend some time in contemplation but he doesn't waste any complaining.

He is honest with himself. He is not indifferent to the help others stand ready to give him. He is big enough to realize that he can help himself to success by accepting the aid of others. He is not indifferent to his own shortcomings and he welcomes constructive criticism offered for his own good. He doesn't stick to antiquated merchandising methods, because they may have been good enough for his father or grandfather. He is not indifferent to change and his mental capacity is such as to enable him to adapt himself to the times.

When the smoke of the readjustment now taking place in the radio industry clears away, he will be right on the job as usual with his place in the sun more secure than ever.

Thank the Lord, he has a brain and uses it.

Radio Show Demonstration

So Many Radio Sets Look Alike But Performance Is the Real Buying Consideration

By K. A. HATHAWAY
Associate Editor

WITH the two great metropolitan radio shows just past but still in the minds of manufacturers and the buying public, it seems well to suggest a matter that would serve to fill a gap indicated by verbal expressions of visitors to the shows.

Notwithstanding the fact that the New York and Chicago radio shows are considered the pivots upon which the radio industry revolves its merchandising, it remains that the ban on demonstrations of products is taking away the purpose for which the shows were first established. It is a recognized fact that under existing conditions it would be impossible to make demonstrations, but it is suggested that pressure be brought to bear so that in the future the exhibitors may have the opportunity of not only displaying but also actually demonstrating their products.

It seems well to make this suggestion now in order that the exhibitors may have the opportunity of setting wheels in motion to fill the need that is indicated on every side, during the week of the show, by those who attend the displays.

Since the Chicago radio show is in home territory we shall take it as the example, though the New York problem would be identical except with respect to the physical arrangement. The Chicago show has always been held, and at the present time there is no indication of a change, in the Coliseum, a long building with an annex at either end which adds considerable floor space. There is sufficient width to accommodate three large exhibits within the center section with a row of smaller displays along the outer edges. The ceiling is unsupported inside the main hall and each of the annexes is of the same arch construction so that the two walls separating the main hall from the annexes constitute the sole break in the display room.

Past practice has been to place the larger exhibitors in the main area with those requiring a small amount of space tucked back at the edges of the building between the arch bases. Gathered together under a single roof in this way it is very evident that any attempt to demonstrate would cause such pandemonium that no one would benefit and visitors at the show would go away with a decidedly dissatisfied opinion. So it is that entertainment has been furnished the exhibitors and visitors through a public address system over which programs were broadcasted from the Crystal Studio.

The buying public had for a time divorced itself from investigations concerning the inside of the radio receivers. They began purchasing from the standpoint of furniture and paid little attention to the mechanical and electrical design, on the theory that the radio engineers who were responsible for the construction of the units were sufficiently familiar with the requirements without any aid from the consumers. But, after a period of two years, the public is again interesting itself in more than

the outward appearance of the radio console and today at the shows we find them stopping to thoroughly investigate chassis that were included in some of the exhibits.

During the week of the Chicago show several of the exhibitors engaged quarters in nearby hotels for the purpose of demonstrating. A few others provided demonstration rooms within a few doors of the Coliseum, and the attendance at those display booths was sufficient to warrant giving the matter of providing demonstration booths for the exhibitors serious attention.

The radio industry has progressed to the point where the value of acoustics is recognized, and included in the findings a great deal has been learned about methods for providing sound rooms. It would seem logical, therefore, that temporary rooms could be constructed around the outer edges of the hall so that the exhibitor could have his display booth on the exhibition floor with the demonstration room next to it.

Such an arrangement would not suffice to make the picture complete, however, for under normal conditions a prohibitive network of antennas would be necessary. Therefore, it seems desirable that the systems used in wired wireless be utilized with a minimum of three programs giving the exhibitors the opportunity of displaying their products more effectively. The programs could be placed on frequencies within the broadcast band one at the lower end of the band, another at the center, and a third near the upper limit of the range of the receivers. The output of the transmitters could be piped to the booths and an outlet provided for each display. In this way none of the sets would have an advantage over any other as might be the case if the broadcast programs from stations were used exclusively.

It seems that if the radio shows throughout the entire country are to hold the attention of the radio buying public and at the same time be of benefit to the exhibitors, some arrangement such as that mentioned must be made. The thoughts expressed in this article are those which first come to mind, and it is not intended that they be taken as the final analysis, for from these suggestions the proper arrangement might be worked out by engineers who would concentrate upon a solution of the problem.



*Cameraman—*I thought you said his screen tests turned out fine!
*Director—*They did, but he's never used Fleischmann's yeast,
*Kelly tires nor Pepsodent toothpaste and he can't tell an Old Gold from a Spud, so what's the use?—*Judge.

* *

The actual printing cost of each copy of *Radio Industries* on the basis of 6200 copies is 20c. Adding the mailing charge each subscription costs the publishers pretty close to \$3.00 for the year. The subscription price to you is \$3.00 or two years for \$5.00.

Instruments for Production Testing Work

"Panel Standard Instruments" Provide for Testing Measurements in Mass Production Work

By P. MacGAHAN

Meter Engineering Department
Westinghouse Electric and Manufacturing Company

THE manufacture of electrical apparatus and in fact manufacturing processes in general carried out on a production basis often involved the necessity for accurate measurements of the electrical quantities involved.

An example of this is the manufacture of radio vacuum tubes of different kinds.

The accuracy required for such measurements is in general much higher than that obtainable with ordinary panel or switchboard type instruments. For example it is well known that a slight error in the setting of the grid voltage in the testing of radio tubes will result in a very large difference in the plate current. Therefore if sufficiently close test limits are set on plate currents to assure in this respect a satisfactory tube characteristic many good tubes will be rejected in testing and many defective tubes will be accepted due to lack of sufficient instrument accuracy. Similarly a higher order of accuracy is needed for many of the other production measurements in many manufacturing processes aside from radio tubes.

Switchboard instruments are not primarily intended for close measurement work. Their principal field of application is for operating or control. The pointers are furnished with large index ends to facilitate reading at a distance and for the same reasons the division lines are made very heavy. The calibration accuracy of switchboard instruments is generally of the order of 1 to 3% allowable error. Many of the smaller types of switchboard instruments are furnished with

control work rather than carrying the delicacy required for high accuracy work.

Portable instruments, however, are designed for use where greater accuracy is required. The preferable position for the use of portable instruments is horizontal and this involves practical difficulties in their application to permanent testing benches designed for speedy production testing such as in radio tubes or similar

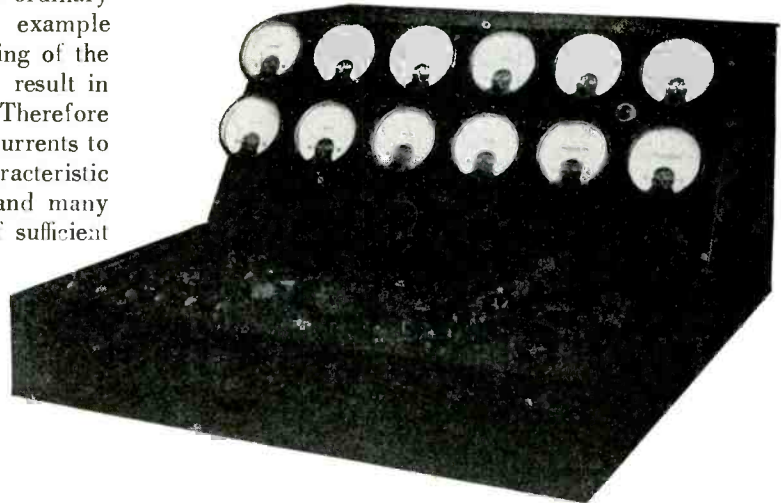


Figure 1—Westinghouse Radio tube test bench showing instruments mounted on vertical panel at the rear of the bench

modern manufacture. It is generally the practice to mount the test sockets on the top surface of the test bench together with the switches and other controls and mount the test instruments on vertical panels at the rear of the bench in a position easily read by the operator making a self-contained outfit. This enables quick readings to be taken.

Figure 1 shows a bench of this character. Typical circuit connections are shown in Figure 2 as intended for testing 1½ volt amplifier tubes.

With large production it is desirable to specialize the test positions or benches for testing of each piece of apparatus only, therefore simplifying the connections and controls and avoiding multi-range scales on the instruments. This means that in any manufacturing plant there will be many different test outfits as there are different varieties of apparatus to be tested.

Unfortunately in the past there has been as indicated above, a conflict between such test requirements and the use of switchboard type instruments which do not have sufficient accuracy for test purposes.

In order to provide a line of instruments especially intended for this class of service instrument engineers have carefully studied the problems of testing measure-

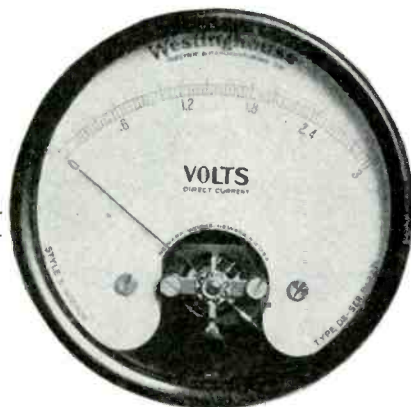


Figure 3—New Westinghouse panel standard d-c. voltmeter

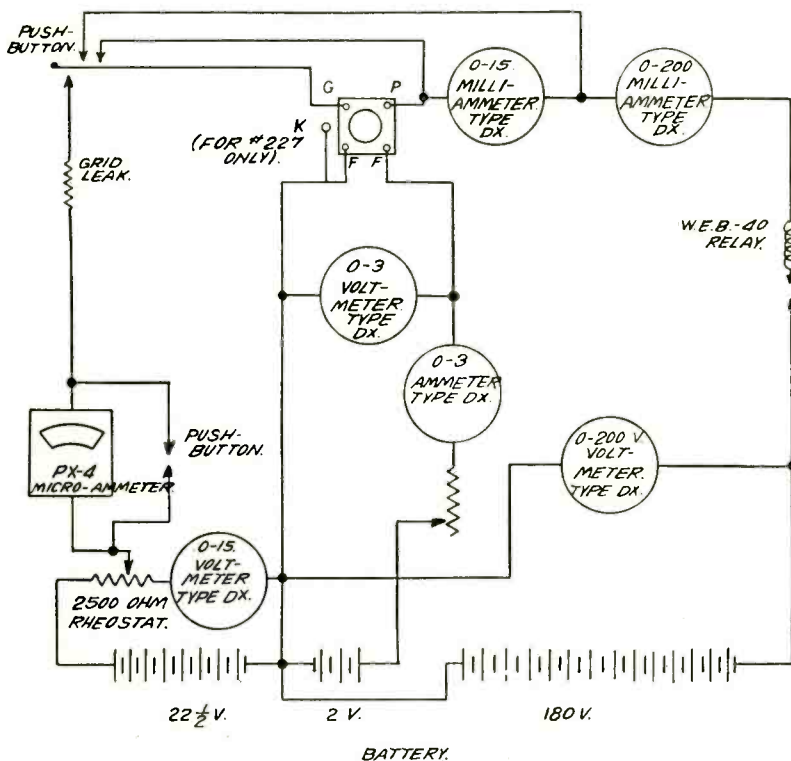
etched printed dials resulting in variable accuracy at different scale points.

The accuracy considered essential and acceptable for switchboard instruments can be obtained without exceptional care in balancing the movement. The design of the bearings, pointers, and other parts are intended to withstand the overloads and rough usage of operating or

ments in production for large quantity production work as regards to measuring instruments and this has resulted in the design of the so-called "panel standard instruments." These were originally intended for mass production work on vacuum tubes but are of course

SCHEMATIC DIAGRAM.

TEST CONNECTIONS FOR # 226 RADIO TUBES AND METERS.



NOTE: FOR OTHER TUBES: SUBSTITUTE BATTERIES AND METERS OF SUITABLE CAPACITY.

Figure 2—Typical test bench circuit connections for testing 1 1/2 volt A-C. amplifier tubes

equally applicable to all kinds of manufacture where quick high accuracy inspection readings or tests are necessary.

Briefly the "panel standard instruments" consist of the combination of a panel or switchboard type cases and mountings into which are placed high-accuracy portable instrument mechanisms. The dial markings are hand calibrated of the fine line type enabling close readings to be taken and the calibration is performed with the same painstaking care and by the same experts that perform the calibration on the high grade portable instruments.

Therefore these instruments possess so far as possible the accuracy and qualifications of the corresponding portable types. The reservation "as far as possible" in the above statement is introduced because due to the horizontal position of the pivot in the bearings of panel mounted instruments there must of necessity be somewhat more pivot friction than in the bearings of portable instruments which are normally vertical in position. This is due to the fact that with a vertical shaft arrangement the contact between the pivot and the jewel is at the center line of the pivot, and therefore the friction works at a much shorter radius than in the case of the horizontal

shaft. In horizontal shafts the end play requirement is such that the contact point between the pivot and the jewel is at the side of the pivot and therefore at a point where the effective radius is greater. Consequently, there is more friction effect.

Figures 3 and 4 clearly show the scales and pointers in two of these "panel standard instruments." The scales are almost 4" long and very clearly divided. The cases however are only 4 3/8" in diameter and therefore the instruments are very compact indeed taking up the least possible space on the panel. The cases are made of heavy, soft-drawn steel, which shields the movement from external magnetic fields. A large amount of experience particularly in actual production of radio tubes has shown that this size of instrument is the best suited for general production testing purposes.

The scales are long enough to make accurate readings on the lower parts which is often necessary and yet the pointers are not too long which would cause instability or variations in balancing due to moisture or other causes.

The happy combination of portable instrument movements and scales with switchboard cases and mountings is thought to be entirely novel and should find a large application in all kinds of testing work where the otherwise preferable horizontal position of portable instruments cannot be employed.

The general designation of "panel standard instruments" has been chosen as being both descriptive of this new type distinguishing it from "portable standard instruments" and also from the usual switchboard or panel instruments.



Figure 4—New Westinghouse panel standard milliammeter, three quarters view

EVERYONE receives his bit of benefit from the incessant toil of his fellow-men, and a kindly feeling of gratitude toward all the world is the smallest pay we can offer to balance our obligations for the many opportunities, comforts and conveniences which have been placed within our reach through the efforts of others.

Construction of Vacuum Tube Pumps

*Hathaway Devotes an Interesting Day to Inspection of
Central Scientific Plant*

By K. A. HATHAWAY
Associate Editor

IT IS not practical for the radio manufacturing establishments to be entirely self-contained so far as production of parts, assembly, and design of machinery are concerned. A part of the work must be done elsewhere. Not the least among those machines that are used in the production of radio accessories is the vacuum pump for use in tube factories and it was interesting during the last month to call upon Central Scientific company in Chicago for the purpose of investigating the construction of the vacuum pumps which they merchandise under the name "Cenco" and at the same time to see many of the various pieces of apparatus which they make for us in school laboratories as well as in laboratories of renown.

Central Scientific company's plant is located at the corner of Ohio street and Lake Shore drive in Chicago. It occupies five floors of the building nearly a half block square and includes the production lines as well as a large group of special laboratories in which the engineers are continually striving to better existing products and at the same time to develop apparatus that will aid in scientific research, including chemical, physical, and electrical.

The radio industry is primarily interested in the development of such things as the vacuum pump. The Central Scientific company entered the vacuum pump field more or less by accident, and it was not until they were called upon by manufacturers of radio tubes that they considered themselves as eligible to the radio industry other than to furnish a portion of the testing instruments such as resistance bridges, thermo-couples, etc.

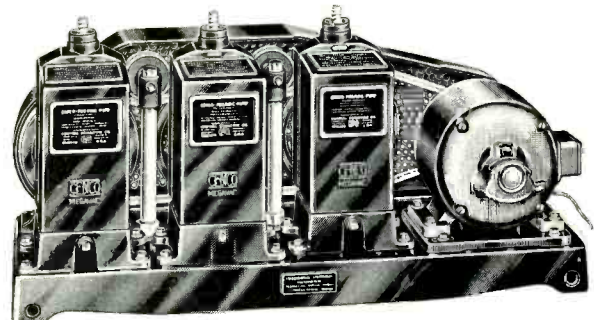
The vacuum pump manufactured by Central Scientific company is of the mechanical type, the kind that meets the approval of tube manufacturers everywhere today due to the inadvisability of having mercury in any form around the internal parts of the vacuum tube. Mercury vapor reacts unfavorably upon the elements of the tube and at the same time is very unruly when placed within a vacuum so that it seriously affects the flow of the electronic stream necessary to the functioning of the tube.

The pumps as manufactured by Central Scientific company today are made in double units, and three of the double units comprise a single triple unit, each of them driven separately by means of an electric motor through a V-shaped belt such as is used to drive the generator and fan of an automobile.

The operation of the pump is extremely simple, but the making requires a high degree of accuracy and great care. There is a cylinder about one and one-half inches deep by about five inches in diameter with two outlets.

In the completed product one of the outlets becomes the intake while the other acts as the exhaust vent. Inside the cylinder is a rapidly rotating eccentric cylinder of metal. It is called an eccentric merely because of its shape whereas actually it acts merely as a sweeper to draw the air and gases in through one of the holes in the outer cylinder and push them through the other. It is keyed to the shaft turned by the electric motor and is lightened by removing a part of the metal between the hub and the outer rim. An oil film seals the space between the eccentric and the cylinder wall.

The two units in the double unit are connected in series so that one of the pumps serves as the backing off pump for the one connected directly to the tubulating tube of that in which the vacuum is being drawn. The triple units are then supplied to take care of three stations on an exhausting machine.



The vacuum pumps are each subjected to a severe test prior to shipment. Using McLeod gages as the guide, each pump must be capable of drawing a vacuum to within one tenth of a micron before it is pronounced satisfactory for installation upon the production line of a vacuum tube factory. A tenth of a micron is the equivalent of one ten millionth of an atmosphere.

Other products of the Central Scientific company include laboratory rheostats, heater units, electrical heaters for maintaining constant temperature of solutions in laboratory experimental work, thermo-couple devices, resistance ratio boxes, and the latest contribution is a short wave transmitting unit for use in class rooms in which the relationship between the wave length in meters can be shown directly by means of the meter measuring stick. The transmitter operates on an extremely short wave so that no interference will be occasioned by its use.

Several other articles are included in the list of products, many of them for use in physics laboratories for demonstration purposes. A group of static machines for use in connection with the old Leyden jar experiments was in process of fabrication at the time of the visit.

Aircraft Radio

Present Day Aircraft Radio Equipment Is Far from Being Efficient

By K. A. HATHAWAY
Associate Editor

IF there is any one phase of the radio industry that has been neglected it is the development of radio for use in aircraft. At the same time, it is without a doubt one of the most important developments of the present day in that upon it depends the advancement of the science of aviation.

In spite of the fact that radio—wireless as it was known at that time—was used during the World War with more or less success in the directing of artillery fire and in reporting observations from the air, the developments of the field has been confined almost exclusively to the government military departments. Less than a half dozen laboratories outside the government agencies have busied themselves with research in aircraft radio and at least one of them has done no more than to embellish the material actually developed by the military departments.

Although the government departments have done a great deal along the line of development of aircraft radio, they cannot be expected to furnish full details for apparatus to be used in a commercial way. Several requirements in commercial transmitters and receivers can be disregarded in the design of equipment used in the army and navy airplanes.

For instance, there is the weight factor. While the engineers designing the radio equipment for the military planes keep the weight comparatively low, it is not essential from an economic standpoint to consider the factor in terms of ounces. The ships used in the army in particular would rarely be called upon to make long journeys and the added weight of the radio receiver would have little effect upon the load of fuel which they could carry. The navy ships, especially those used over the water, are a little more exacting, for they may be out over water for a considerable length of time and the limitations on the weight are more critical. Hence, it may be said that the navy rather than the army has done more toward the development of commercial aircraft radio.

At the present time there are no rulings to the effect that any of the commercial transport companies shall carry radio equipment. The larger air lines have been engaged during the past year in effecting a system of communication between ground stations and their ships in flight, but from the information at hand it does not seem that any of them are attacking the proposition from the right angle.

The writer has spent a great deal of time during the past two years investigating the aircraft radio field and is at the present time engaged in an extensive program of experimental work in collaboration with other organizations in the hope that a better and more logical radio system might be evolved.

Apparatus that is obtainable on the market today for aircraft radio work is not one hundred percent efficient. Most of the organizations working on the problem overlook the fact that radio is not needed solely during the

time of flight, but also in case of a forced landing from any cause whatsoever, whether it be because of storms, engine trouble, or any other reason. Every few days the fact is brought home but the lines continue to equip their ships with the antiquated apparatus using power supply units that are rapidly becoming passe.

It is not in the circuit design, nor in the physical design of the apparatus that the inefficiency exists. It is in the method of furnishing the power supply. A generator known as the wind driven generator has been used almost exclusively as the means of furnishing the high voltage necessary for transmission of radio. The wind driven generator is, one of the lightest in weight of the entire group of power supply devices and therefore appeals to the aircraft designers. That is, it will weigh less when placed on the scales. But it is necessary that the wind driven generator be placed in an exposed position where the slip stream may rotate the propeller placed in the head assembly.

While the generator is light in weight, when placed out in the open, it assumes a greater effective weight than that actually shown on the scales and in addition to that it sets up a wind resistance that is not negligible. Authorities high in aviation circles state emphatically that the resistance set up by the presence of the wind driven generator is sufficient to retard the ship as much as two to three miles per hour. For an individual hour the loss of two or three miles would be negligible, but with the increased use of airplanes on long hops, thirty hours time would mean the loss of from sixty to ninety miles or an equivalent of approximately eight gallons of gasoline for the ordinary ship.

Efforts have been made to mount the wind driven generator so that no resistance would be set up at times other than when the radio apparatus was being used. Such an arrangement is satisfactory so far as use in flight is concerned, but there remains the lack of a power supply in case the ship is down.

To go into a full explanation of the details of an efficient radio installation for aircraft would require more space than can be allotted in this issue. Therefore, this article will be supplemented next month with a description of ways and means of providing a commercial aircraft transmitting and receiving set, capable of operating both during flight and while the ship is grounded at the same time taking the weigh factor into serious consideration as determined from investigations and experiments conducted to date.



Flora—Should a girl permit her boss to kiss her during business hours?

Dora—Sure, if he means business.

* *

There is only one way of being certain of receiving *Radio Industries* regularly each month. Better send along your subscription.

Standardization of Dimension Lumber

One of the Most Recent Developments Which Spells Economy for Industry

By RAY M. HUDSON
*Ass't Director for Commercial Standards
 Department of Commerce*

WITHOUT exception, standardization has proved itself to be practical in all industries to which it has been applied. The lumber industry was among the first to recognize the advantages of standardizing the sizes and grades of its products and has benefited as the result of its decision to fall in line with other progressive industries. It is difficult to understand, says the National Committee on Wood Utilization, the reason for an almost complete lack of standardization of small-dimension stock.

The production of small-dimension stock, that is, hardwood or softwood, cut to size at or near the source of supply and 100 per cent usable to those industries which fabricate and assemble wood products, is one of the most recent developments in the lumber industry. Small-dimension stock is also called dimension, small-dimension, ready-cut stock, and fabricated stock.

The principal difficulty attendant upon the popularizing of the use of small-dimension stock has been that a satisfactory supply of it has not heretofore been available. With a view to encouraging the establishment of reliable sources of supply of this material, and of promulgating information as to the most authentic practices employed in the industry, the National Committee on Wood Utilization, of the Department of Commerce, has compiled a report, *Small-Dimension Stock, Its Seasoning, Handling, and Manufacture*. This report will be available in printed form soon.

Investigations of the committee show that small-dimension stock has been found especially convenient and effective for use in a number of wood-using industries. The automobile and truck body, furniture and chair manufacturers, and wood-turning plants are at present the largest consumers of small-dimension stock. Large quantities of this material are used, however, in the manufacture of such products as agricultural implements, radio cabinets, caskets and coffins, electrical machinery and apparatus, laundry appliances, musical instruments, railway cars, sporting goods and toys, window and map rollers, and many other such articles.

One of the principal facts developed by the committee is a need for the standardization of sizes and grades of small-dimension stock. The entire quantity of stock manufactured under recognized grading rules at the present time is very small compared with the total dimension production. Probably 95 to 98 per cent of small-dimension stock is cut and graded under order specifications rather than under generally accepted grading rules. Increased production of dimension stock manufactured under accepted grading rules or specifications established by each branch of the industry, including automotive, furniture, wood-turning, and similar branches, is an apparent need.

As the situation now stands, it is impractical for manufacturers of small dimensions to cut for stock unless they know that this material will be purchased by reliable consumers. With the establishment of standard sizes and grades the manufacturer would be assured of a market for such material, and could utilize odd sizes of lumber, left from cutting larger orders, for the manufacture of standard chair legs, stretchers, or other forms of small-dimension stock, whether he had specific orders for them or not, since as standard material they would always be salable. Under these conditions a producer could utilize larger percentages of stock than the man who cuts for a limited number of orders. Furthermore, with standardization a fact, the producer can safely manufacture during the slack months and thus eliminate the overhead and carrying charges which accumulate during periods of production activity.

Under present conditions the consumer of small-dimension stock must place his order several weeks in advance of expected delivery. If sizes and grades were standard, a large percentage of all orders could be taken from stock, thus insuring the consumer prompt service. Finally, small-dimension standardization would eliminate the necessity for keeping orders separate, would economize mill space, and would simplify the taking of inventories.

Although the standardization of sizes and grades of small-dimension stock has not become an accomplished fact, a foundation for standardization has been laid. The United States Forests Products Laboratory has investigated the hardwood consuming field and has issued a report entitled, "Sizes and Quantities of Rough Cuttings Required by Hardwood Consuming Industries." This report contains information as to the sizes most used in the nine important consuming industries; and the National Hardwood Lumber Association has adopted rules regulating sizes and grades for furniture stock and turning squares.

Even though these accomplishments are only an initial step in the standardization program, they form a basis on which to build for standardization in all branches of the dimension-consuming field, so that at some not far distant time we may hope to arrive at a condition of complete standardization of ready-cut stock with benefits resulting both to the consumer and producer.

It is because the National Committee on Wood Utilization realizes the importance of the standardization of sizes and grades of small dimension, that it has devoted a chapter of its report on dimension to this subject.

* *

Identify yourself! Send in your name and address together with the name of your firm and position. Tell us to enter your subscription. Bill will reach you later.

What About the Radio Dealer?

Some Thoughts for the Manufacturers' Careful Consideration

By A TYPICAL RADIO DEALER

WHAT about the Radio Dealer? The Radio Prospect to the Radio Manufacturer is alike, as soil is to the farmer. The farmer buys the best up-to-date equipment to improve the field and keep it in running order, free from handicaps, so as to keep his cost of operation low. Radio Manufacturers do not need to buy outlets; Radio Dealers are established, but I should think the manufacturer would give some thought to encourage the good dealer.

Some communities have good associations for cooperation and a code of ethics. It is impossible for any such organization to function one hundred percent alone and besides the majority of radio dealers will not join such an association.

ONE day last month a dealer friend of ours from the Northwest phoned us between trains. He intimated that there was considerable dissatisfaction among reputable dealers, because of certain conditions, brought about through lack of cooperation on the part of the manufacturer. During the conversation we asked our friend to telegraph us a statement of his thoughts in the matter upon his return home. He quickly responded and his views as a Typical Radio Dealer are printed on this page for your consideration.

Now the manufacturer advertises "Ask for a free demonstration." In a few instances we have made demonstrations in homes, our terms are six percent carrying charges, on unpaid balances. Along comes a neighbor or friend and tells this prospect that he can buy this same radio without paying such interest, in fact no interest at all, or no interest for first twelve months, or only three percent. We lose the sale, because we were a good dealer, doing what the manufacturer advises, and then to be told that we are "robbers" by the prospect. The supposedly good dealer says when answering a telephone inquiry, "We do not demonstrate, but in turn we do not make a charge for deferred payments." He gets the business—we do the demonstrating.

In the tire business some manufacturers have gone so far as to establish their own branch stores, but after a short time they discovered that the trouble was not because they did not have good dealers, but rather because of a lack of interest among the dealers.

Last month we were told that a housecleaning was in order and, therefore, we are going to have a one hundred percent selling arrangement. Is it not time now for Mr. Radio Manufacturer to use a little foresight? See that the distributor calls his dealers together and educates them

as to how to make money; rid himself of such dealers that will not sell on a definite schedule and not wait until it is too late and costly. A man buys an automobile on the same business basis from all dealers selling that car and still he has the trade in evil left, which is bad enough to break him, if he is not careful. In the radio business it is not only the carrying charge and trade in evil. We have aereals given away, large cash discounts, a year guarantee on tubes, sales made by the distributor at wholesale, prices to employees; all their acquaintances, neighbors, relatives and some to anyone; free service for one year; shot guns and wash machines, and "what-not" as a trade-in; articles obsolete and out of date, radios sold through the "Gip Store" instead of through a good dealer; grocery stores and barber shops as dealers, with no thought of how they are equipped to give service.

This year in June we were told that all the 1930 Radio Models were ready, "Come down to Chicago and pick a line. Now, it looks like we may have new models again before Christmas."

If rumors come true—if the manufacturer will clean house first, have an established uniform price decline policy, pay the dealer extra labor when a weakness develops in a radio because of a factory error, have fewer outlets and establish a code of ethics, followed by a little backbone; it will be a life saver for the industry at large.

This plan, I believe, would make it unnecessary to call the Honorable President of the United States to regulate the price of radios, owing to the supply being greater than the demand.



OFFICIAL COMMUNICATIONS

Since the proof of the efficiency and secrecy of radio telegraph in the World War much of the communication between embassies and legations in the United States and their home governments has been sent in code by radio. The district manager of R.C.A. Communications, Inc., which handles the messages, is F. P. Guthrie, who before 1923 was the manager of the radio department of the Shipping Board.



SPEEDING UP JUSTICE

The increased use of radio in the United States and by Scotland Yard in spreading information to aid in capturing criminals has been watched carefully by the French police. As a result, it has been announced, funds will be allocated in the new budget to construct a radio station in Paris to give the police there immediate contact with stations throughout France. The recent capture of a New York forger in Honolulu after identification by a photograph which R.C.A. Communications, Inc., sent by radio across the Pacific has attracted attention to another way in which radio can aid in the apprehension of criminals.

When the worker is found to be absent without cause, his negligence of duty to his employer is called to his attention from the practical viewpoint of business loss. Invariably when the employee finds that his absence is being made a matter of record, he begins to take a new interest in getting to work regularly and on time.

Charts which show graphically the record of each shop and department are posted weekly on conspicuous places, and seldom is a foreman who finds his shop low on the list, not moved to sudden effort toward bringing his shop record to a more creditable position on the chart. In a sense, the chart is a gage of foremen's efficiency—at least, they consider it as such.

On February 15, 1928 the worst shop in this company had a punctuality record of 15%. That means that the average person in that shop reported punctually only 15 times out of 100. The second week of the system, without any urging other than the posted records, the low record was 22%, the third week 39%, the fourth week 44%, and during the last week of October, the low record was 58%.

The general punctuality record for all offices increased from 68.08% on March 1 to 93.0% on November 1; in the shops, from 93.09% during the same period. The actual value of this increased punctuality is apparent to any employer.

The company's expert claims that the reduction of absenteeism increased plant efficiency, and aided in lowering costs. He says further, in commenting on this feature:

"In estimating the value of reduction in absenteeism, the following features are worthy of consideration:

"1. When persons who are expected to report for work are absent, the planning of the activities of a department cannot be arranged so closely in advance of the day because no one can tell what particular employees are going to be on hand.

"2. Absence may occur in such a manner as to destroy the balance in the force—they usually occur by groups.

"3. Irregularity in attendance frequently breaks up the continuity of work. If a man is absent a few days, after he has once become accustomed to an operation, and another has to be instructed how to continue it, production experiences a serious setback.

"4. There may occur absenteeism of such a nature that there is one available to fill the places of the absentees. Then it becomes necessary to secure men from outside the company to take the places of the irregular employees.

"5. When the working force is regular in attendance, it is not necessary to keep so many persons on the payroll; consequently it is possible to dismiss the least desirable and so increase the average quality of the employees retained.

"6. Regularity in attendance is an important element of discipline. An employee who is accustomed to toe the mark in one respect will more readily observe all other regulations.

"7. By enforcing regular attendance the employees earn a larger income each week. Then, when they look back over their earnings, they are much more contented with what they've done and with the plant where they work."

This company has found that comprehensive and reliable personal records are invaluable to a large business organization. In compiling and keeping them, it emphasizes the fact that accuracy is a most essential feature. When properly kept, states this company, personnel records should be such that "any weak spot can be located immediately and the cause definitely determined."

For instance, when the time comes that workmen must be laid off, this company has no difficulty in picking out those it can best afford to drop—those whose personnel records show the greatest number of "times late" and "times absent." Knowledge of this has a decided steadying effect upon the workmen.

PUNCTUALITY MEMO	
Week ending May 15	
TO FOREMAN DEPT A	
Shops average this week	92.1
Offices " " "	81.6
Your " " "	91
" " last "	90
Signed A. M. Parker	

ONE WAY TO WORK ON PRIDE

Each week every foreman gets a memo that shows him where his shop stands in comparison with the others.

At the end of each week, the personnel department posts throughout the shops another chart showing the comparative rate of punctuality in each shop department and office. Again the element of intershop jealousy and interforemen jealousy enters to play a prominent part. The foreman whose shops are low immediately get busy to see they are not low the next week; those whose shops are high put forth new efforts to make them even higher.

ATTENDANCE RECORDS FOR WEEK OF May 10-15, 1928	
Main Office	85%
Sales Dept.	70%
Shipping Dept.	90%
Dept. A	91%
Dept. B	90%
Dept. C	95%
Dept. D	98%
Assembly Room	89%
Finishing Room	90%
Average for all Offices	81.6%
Average for all shops	92.1%
Average for Factory	86.8%
Factory Average last week	98.5%
(Signed) GENERAL MANAGER	

What Power Amplification Means to You

How Every Radio Manufacturer Can Cooperate in the Problems of Sound Projection

By LUDWIG ARNSON
Vice-President Radio Receptor Company

ALMOST every week the newspapers announce the acquisition by some large moving picture corporation of a chain of theatres formerly used for stock, vaudeville or burlesque presentations. This conversion of theatres from the gods of the spoken drama to the newer religion of Hollywood is significant to the radio industry, which, due to capacity if not over-production, finds itself in a peculiar situation. Radio salesmen find most homes already equipped with modern receivers. Sales resistance is steadily increasing. The outlet for radio sets seems for a moment somewhat blocked, as contrasted with the wide open market of a few years ago. Manufacturers are cutting production, waiting for the sets which are blocking the consumer stream to disentangle and float down to obsolescence.

Meanwhile, also every week, we read in our local newspapers as well as in our trade papers that this school has been equipped with a public address system, that the electrical voice made the local fair more enjoyable by loud yet pleasant announcements throughout the crowds quite as well as music, that the local church has installed a public address system whereby the clergy may better do its work, and so on and so on. This is the age of the electrical voice. Its application seems without limit.

Thus a new outlet has been created for radio products. But the radio manufacturer must be careful not to exploit the new field as he has done the old. He must not scale his prices to all the traffic will bear. The power amplification development will not provide the field day that the home radio set once did. The running leap and the blind plunge will land the manufacturer in hot water, for the theatre, church, school, stadium, or what-not does not require a glorified radio set with perhaps a bit more amplification. Its problems are different and many fold. It is electrical, plus amplification, plus acoustics, plus sound and film synchronization, plus electrical phonograph rendition, plus microphone technique.

The sound system is largely a custom-fit proposition. Each theatre, church, auditorium and so on presents new and unique problems which must be individually solved. There is no general prescription and cure-all, such as we have in the average home to be provided with broadcast reception.

Fortunately, a few concerns have made a thorough study of the many problems of sound amplification, distribution and reproduction. They have laid aside all other work and specialized in this technique. Manufacturers who think to enter this field on the basis of their radio experience will find the sledding decidedly rough, and themselves far behind the few who have studied the

conditions exhaustively. They may say that competition is the life of trade. They are wrong. Co-operation is. And the power amplification specialist is ready and willing to admit his need for co-operation from the radio manufacturer. The application of power amplification systems can never be standardized. The equipment may be of standardized design, to be sure, but the choice of equipment and the installation can never be. In this respect it will never be a satisfactory side line for the radio set manufacturer.

But the task of providing a complete installation from start to finish is far beyond the capabilities of any one power amplifier system company. A complete installation requires microphones, electric phonograph pick-ups, radio receivers, specially designed power amplifiers, panels, racks, switches, wiring materials, wall plates, remote controls and a wide variety of other devices and components that fall within the province of others than the power amplifier system organization. The latter is essentially a co-ordinator of many different components into a balanced and smooth working whole. It is here, then, that we look for co-operation from the radio industry, with whom we are so closely allied. Aside from the power amplifiers proper, the panels, racks and a few other features, we must look to others for our units, supplies and other details.

And so this is a plea for co-operation from radio manufacturers, whether they be set or parts specialists, it matters not. It will pay radio manufacturers to consider the modern sound system, and to see what they can offer to the ensemble of components. It will not detract from their radio work, and may indeed benefit the manufacturer in slack times as well as in flush times. Just as wise rubber products manufacturers of a quarter century ago turned from hot water bottles to co-operate with the infant automobile industry in the manufacture of pneumatic tires, so the wise radio manufacturer of today will co-operate with the sound system specialists in the supplying of components. The benefits will be mutual.



RUSSIA BUYS LARGEST RECTIFIER

The largest high voltage rectifier ever constructed for radio was shipped recently to the Russian Government by the Radio-Victor Corporation of America. It is capable of a power output of 750 kilowatts at 16,000 volts and contains 18 mercury-vapor rectifiers. The mercury-vapor rectifier was developed by engineers associated with the Radio Corporation of America, who asserts that it is more stable and more efficient from every point of view than any system previously devised.

What Price—Service Men?

Advancing the Standards of Servicing Personnel Requires Consideration of Proper Remuneration

By H. G. BOYLE
A-C Dayton Company

PRACTICALLY every radio trade publication has at some time published articles, advertisements and editorials advising the world at large that it needed a tremendous number of competent radio service men and that all who answered the call would be handsomely rewarded each and every Friday evening henceforward.

At least a part of these statements are true for it is an acknowledged fact that the available supply of really competent service men does not satisfy the demand. Yet we are somewhat doubtful of accepting the statements concerning the financial reimbursement for from all available information it appears to have been knitted from the whole cloth.

In the natural order of things a service manager hears every phase of service work and the question of inadequate pay seems to have finally become a paramount issue. It seems that for the knowledge and experience required the remuneration is very poor when compared with any recognized trade.

Some few efforts have been made to classify service men according to experience and previous education, designating them as class A, B or C; or as Apprentice, Journeyman and Master. While the powers who inaugurated this move were kindly inclined and felt that their work was on the behalf of the service men they really started in the wrong place. Before any group of tradesmen can be classified or otherwise regarded as a part of a unit, the unit itself must first exist.

While various manufacturers, distributors and service organizations have endeavored to create and maintain a semblance of unity among service men in their locality, we are not aware of any such organization which may be regarded as a true power.

The fact that tool designers, draftsmen, mechanics, bricklayers and bankers command the salaries they do is primarily dependent upon their ability to maintain a positive functioning organization with a recognized commander who dictates their policies, salaries, working hours and diet.

In the main a service man is an independent fellow who resents being dictated to, yet such action is necessary in order to produce the desired fattening of the weekly stipend.

Just how such an organization can be produced from the present chaos is difficult to foresee, but the present unrest requires that something be done. Dissatisfaction has long been the mother of improvement invention and the present situation appears to be brewing a leader who will clear the way.

In the meantime some of the more flagrant advertisements of fabulous rewards for service work might be colored to meet the actual facts. On the alternative the advertisers might lend their facile pens in a manner

which would insure service men a living wage. From all appearances this would require a doubling of the present rate.



KOLSTER EUROPEAN BUSINESS GOOD

An increase of more than 200 per cent in daily production over last year's figures is announced in a report from Kolster-Brandes, Ltd., of England, just received by Ellery W. Stone, President of Kolster Radio Corporation. This growth is accompanied by a similar increase in monthly billings, which are now among the highest in Great Britain's radio industry, according to the bulletin.

Combination radio sets and gramophones will be added to the Kolster line in England within 60 days. This announcement has noticeably increased the interest of Britain's dealers in Kolster products.

As a result of the National Radio Exhibition recently held in London, when the new line was displayed, the number of Kolster-Brandes dealers in Great Britain has increased from 2,200 to 3,500, a growth of 62 per cent within a month.

After having been the first radio manufacturer in England to broadcast a regular program, inaugurated as a weekly feature a year ago over the Hilversum station in Holland, Kolster-Brandes has added to its prestige by sponsoring a two-hour program over the Toulouse, France, station on alternate Sundays. Both Hilversum and Toulouse are heard clearly over the British Isles as well as the western part of the continent, and these concerts are reported to be creating good-will among the listeners.

Musicians from the famous Mengelberg Orchestra of Amsterdam compose the Kolster orchestra at Hilversum. The new radio orchestra at Toulouse includes 25 of the finest musicians in France.



MEMORIES OF THE PAST

The artist who drew the front cover of the General Electric News for August, 1929, tried to bring out an idea that has recently been attracting the attention of all of us, namely, that it is very old fashioned to be wasteful. Excessive waste, the artist felt, will soon be considered quite as obsolete and absurd as gas lights, side burns, and the horse and buggy as a means of getting around. Let us all hope he is a good prophet and that the days of excessive waste will soon be nothing but memories. The front cover of the General Electric News has a red background with pictures sketched in white. The pictures represent the old fashioned buggy, gas light, side burns, spinning wheel, high-wheel bicycle, and in the center is the well-known waste can.

The Ultimate in Radio Reception

Amateur Builds Short and Long Wave Combination Set

BURT H. TAYLOR, amateur radio wizard of Haverhill, Mass., has attracted wide-spread attention among radio engineers by his successful efforts in combining on one hook-up short wave and regular broadcast reception, the change from one to the other being made by merely pushing a button.

Mr. Taylor, laboring until the wee small hours of the morning, after completing his duties as night manager of the local Postal Telegraph, sought a method of combining short and regular broadcast waves. His success came with the appearance on the market of the new Zenith automatically tuned screen grid radio, which provided the solution and gave to the world the first combination receiving set; the audio circuit of the Zenith being the missing link in Mr. Taylor's experiments.

Mr. Taylor secured a detailed plan of the Zenith circuit. Then he made changes and arranged different hook-ups until the most satisfactory one was found. His next step was to find the proper tube for audio. With the solving of this problem came the creation of his combination set.

Mr. Taylor found the particular coupling method of the Zenith allowed the short wave receiver to be set up at all times on the phonograph connection, a feat impossible on any other set.



Perhaps years ahead of the rest of the public, Mr. Taylor sits at his combination set and picks world-wide stations.

Formerly it was necessary to remove the detector tube and plug in on the short wave set. Then, to return to the broadcast band it was necessary to remove the adapter and replace the detector tube. Quite a bothersome process. In Mr. Taylor's combination set the short wave audio is eliminated and the high power audio of the Zenith used instead, increasing the signal strength available for the short wave receiver. Mr. Taylor has used one of the tuning buttons of the Zenith in switching over to the short wave, by setting the button to the same wave length as that tuned in by the short wave unit.

Thus, by pressing the button the regular broadcast is shut off and the short wave station to which the short wave unit is tuned in at the time appears.

Mr. Taylor demonstrated the remarkable performance of his combination set by first tuning in KDKA. He pressed the short wave button. Presto! The Byrd Antarctic Expedition was on the air. Then back to the regular broadcast band, this time a musical concert from Chicago. Again the button, and a singer's voice came over from London. Again the button was pulled out to get some local station. The final short wave station in the demonstration was 2ME, Sydney, Australia, which came in clear and strong. And nary a change of plugs or tubes or wiring. Just push the button.

One little trick of Mr. Taylor's we cannot be so enthusiastic about. He tuned in on a young man who was in transoceanic telephone conversation with his sweetheart in Paris. Some people wonder what can possibly be said to merit such a long distance call. Tune in and find out.

Mr. Taylor, besieged with requests from engineers, is preparing to demonstrate his combination set to the leading radio engineers in the country.



CENSUS OF MANUFACTURES

The Advisory Committee on Manufactures, appointed last summer by Secretary of Commerce Lamont, has gotten well under way. Industrial leaders, trade associations, the trade press and broadcasting stations are all cooperating.

Meetings of the leaders in 16 of the key cities of the country are now being held and will conclude with one in Boston on January 4th. The first of these meetings took place last month at the Pennsylvania Hotel in New York and was addressed by Dr. Julius Klein, Assistant Secretary of Commerce, Colonel L. S. Horner, Chairman of the Advisory Committee on Manufactures, Fred M. Feiker, Chairman of the Advisory Committee on Distribution and W. M. Stuart, Director of the Bureau of the Census.

Through these meetings, all of which will be broadcast on radio net work, the Bureau of the Census hopes to so inform manufacturers as to the value of the Census information that the reports on production operations will be made available to the Census Bureau in Washington by the middle of February at the latest. Such an accomplishment would make it possible for the Bureau of the Census to make available to the manufacturing industry basic data within six months—a result which would render the Census of Manufactures of inestimable value to American manufacturers in the study of their production and marketing problems. In addition the Census Bureau believes that many thousands of dollars will be saved to the Government through more accurate returns, and a material decrease in the amount of special field work necessary to obtain correct reports.

AMONG THE LEADERS

In line with a policy of allowing one hundred prominent citizens of Pennsylvania to use their initials on their automobile license plate instead of the customary numerals, A. Atwater Kent will use the two letters A K.

* *

"You are cordially invited to visit the very interesting CeCo plant where the CeCo Tubes are manufactured" reads an invitation sent to the Industry last month over the signature of Ernest Kauer, President of the organization.

* *

Arthur Moss, President of Electrad, Inc., has just written us of the closing of a lease for additional factory space necessitated through the proposed introduction of a new type of volume control and a full line of amplifiers right after the first of the year.

* *

Radio-Victor Corp. recently issued a four page leaflet, done in modernistic style, concerning Radiotron Tubes and in which was quoted the editorial, "Tubes vs. Tubes" from the September issue of *Radio Industries*.

* *

Curtiss Abbott, formerly General Sales Manager of the Eveready Radio Corp., has been made Pacific Northwest Manager for Philco effective at once.

* *

Fully recovered from his recent automobile accident, Mc Murdo Silver, President of Silver-Marshall, Inc., is back at his desk having lost none of his old time vigor and enthusiasm.

* *

L. T. Breck, Vice-President of Kolster Radio Corporation and himself an aviator, had occasion to test the practicability of aircraft radio recently when the passenger plane, in which he was returning to New York from the Coast, was forced down somewhere in New Mexico.

* *

J. J. Reilly, Sales Manager of Wakem and Whipple, distributors for Kolster and Brandes sets, recently visited dealers in the Indiana territory.

* *

The first convention in history of graduates of a home study course, was held last month in Washington by the National Radio Institute, with a reported large attendance.

* *

N. O. Williams, Vice-President and Chief Engineer of CeCo Mfg. Co., Inc., has recently had the title of Works Manager added to his name.

* *

Thomas F. DeLaney, Jr., long identified with radio selling in the New York territory, is now associated with the Central Hanover Natnl. Bank and Trust Co. of New York.

* *

"Nick" Carter, President of the firm bearing his name, recently conferred with Hugh Eby and other principals of the new Utah merger, at Philadelphia.

* *

R. H. Woodford, former Sales Manager of Stewart-Warner, is now associated with the Baldwin Piano Co. of Cincinnati in a similar capacity, it is reported.

* *

Alfred Marchev, President of Temple, is visiting various subsidiaries in Europe and, while over there, will spend some time at his old home in Switzerland.

H. S. Brown, President of the Paper Tube Co. and very well known in the radio and electrical industries, had the misfortune last month of losing his wife in an automobile collision.

* *

K. A. Hathaway, special writer for the Chicago Daily News and associate editor of *Radio Industries*, visited Eastern radio plants the greater part of last month.

* *

Our friend, Harry Cory, Secretary of the Northwest Radio Trade Association and Publisher of *Radio Record* at Minneapolis, visited the offices of *Radio Industries* last month.

* *

If you don't believe that Fred Damarin, Sales Manager for Brown & Caine, Inc., gives personal service to his out-of-town customers, just try to reach him on the phone sometime.

* *

CeCo report that they have manufactured 10,000,000 radio tubes to date with a daily capacity at present of 55,000.

* *

Thomas Liddell, Vice-President and Business Manager of Radio Industries Corporation, is spending a month in the East calling on manufacturers and headquartering at the Governor Clinton Hotel, New York.

* *

President H. B. Richmond of the Radio Manufacturers Association predicts an excellent year ahead for the Industry.

* *

"The era of suspicion and distrust among radio manufacturers is over", stated Major H. H. Frost when commenting on the wholehearted spirit of cooperation among radio manufacturers, recently.

* *

The Statistics Committee of the Radio Manufacturers Association, of which George C. Furness of New York is Chairman, are engaged in the preparation of statistics tending to show the past production and sales of the Industry.

* *

After several years of constant use an automobile loses its paint, acquires squeaks and becomes most embarrassing to an otherwise proud, dressed up public, but the radio set can be tucked out of sight and as long as the performance is good nothing else matters. The Industry has a real job on its hands in educating the public to discard obsolete sets that have given years of service and otherwise outlived their usefulness. More advertising such as that sponsored over the air by the Kolster Radio Corporation is exactly what the Industry needs.

* *

Colin B. Kennedy, President of the Colin B. Kennedy Corporation, has just returned from a trip to Canada where he perfected plans for large Canadian sales during 1930.

* *

A single idea in a single issue of *Radio Industries* might answer one of your most difficult problems and save you thousands of dollars. Buy yourself a new automobile with the amount you save.

* *

STOP? If you are not already a subscriber to *Radio Industries* don't read another page until you have dictated that letter telling us to enter your subscription. Don't bother enclosing check.

NEWS OF THE INDUSTRY

Our readers are interested in live news of the industry

PERRYMAN SALES RISE

Sales of Perryman Electric Co., Inc., for October were \$230,000, compared with \$176,202 in September and \$136,000 for the corresponding month last year.

Demand for Screen grid tubes is more than the company can fill at present. H. Burbank Foster, Vice-President and General Manager, stated, and facilities for making this type are being extended to reach an output of 5,000 a day before the end of the present month, an increase of nearly 500% over present capacity.

FLYING TRIP

A really "up to the minute" radio business trip totaling 4,000 miles recently was completed in 35 hours, actual flying time, by Pilot E. N. Pickerill of the Radiomarine Corporation in the 8-passenger Super-Universal R. C. A. Airplane, equipped as a model of completeness in modern airplane radio installation. Pilot Pickerill swung around a wide circle in the United States, starting from New York and including Cleveland, Chicago, St. Louis, Tulsa, Fort Worth, Houston, New Orleans, Atlanta, and other points.

ISSUES DATA BOOK

The Radiotron Division of the Radio-Victor Corporation of America have just published the Radiotron Data Book, containing 106 pages of prepared information for dealers and distributors.

SPRAGUE MOVES

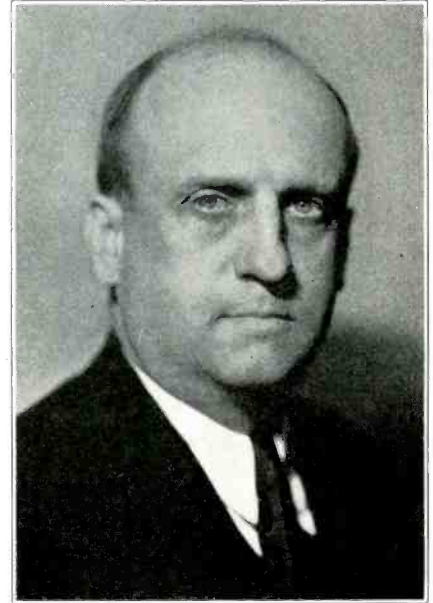
North Adams, Mass. is the new home of the Sprague Specialties Company, condenser manufacturers. A spacious, four story building, known as the Beaver Mills, gives the Sprague organization increased space and better all-around facilities than were enjoyed at Quincy, the former plant location.

A bit of romance is attached to this move to North Adams. Here it was that Frank J. Sprague, widely known electrical inventor, graduated from High School and started his early business career. That was way back in the seventies.

The Sprague Specialties Company is operated by Mr. Sprague's three sons. Robert C. Sprague is president and treasurer of the company; Frank Desmond Sprague, plant manager and Julian K. Sprague, vice president and production manager.

RCA-VICTOR ANNOUNCE

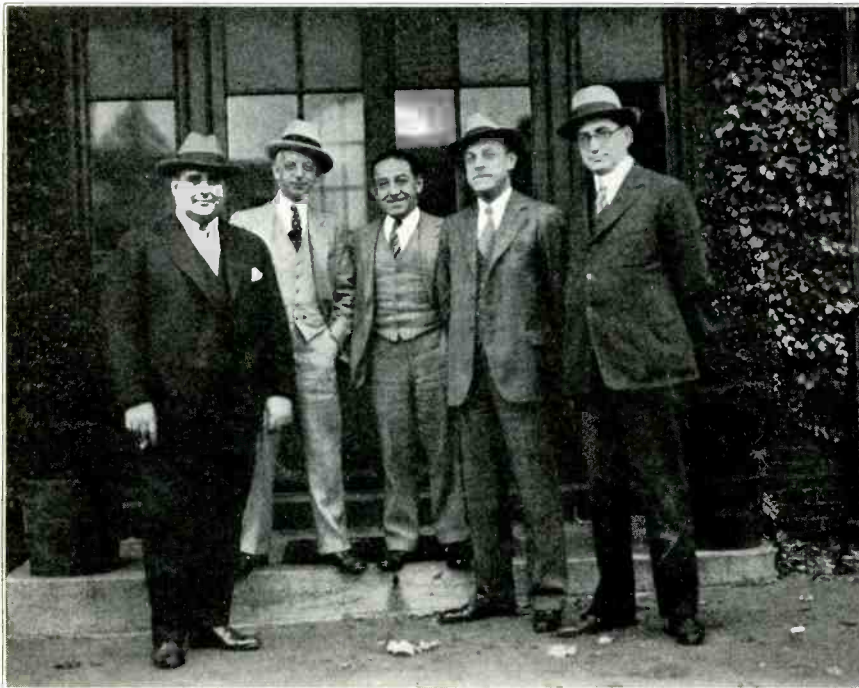
Mr. E. E. Shumaker, president of the RCA-Victor Company, Inc., which begins operations January 1, 1930, today announced the appointment of Major I. E. Lambert as vice president and general counsel, and of Mr. E. C. Grimley as treasurer and comptroller of the new company.



MAJOR LAMBERT

EDISON SALES MANAGERS GET TOGETHER AT ORANGE PLANT

A group of men responsible for the sale of Edison radio sets met at Orange, N. J., last month in a conference with officials of the company. Sales Managers with their assistants from most parts of the country were in attendance.



In the picture you see, from left to right: H. H. Silliman, Eastern Sales Manager; Roy S. Dunn, Western Sales Manager; P. J. Burns, Orange Manager of Edison Distributing Corporation; S. F. Patchin, Chicago Manager of Edison Distributing Corporation and R. R. Karch, Assistant to the Vice-President.

Major Lambert at present heads the legal department of the Radio-Victor Corporation of America which will be absorbed by the new and larger company, and was previously assistant general attorney of the Radio Corporation of America for over five years. He is a graduate of the University of Kansas, class of 1912, and after a short activity in newspaper work and a post graduate course at the University of Chicago practiced law in Emporia, Kansas, for five years. He was a flyer in the Air Service during the war. After the armistice he was transferred to the Judge Advocate's Department and served as counsel to the War Department Claims Board. He was trial counsel for the Federal Trade Commission for more than three years. Major Lambert was very active in Kansas politics and held a number of important political offices. Among others, he was Lieutenant Colonel and aide-de-campe to former Governor Henry J. Allen.

Elmer C. Grimley is a native of Newburgh, N. Y. He was graduated from the School of Commerce of New York University and following graduation, was a public accountant in New York City for four years. When the United States entered the war, Mr. Grimley enlisted in the Navy.

Two years later he was discharged with the rank of Lieutenant, (junior grade). At the close of the war he joined the Victor Talking Machine Company. With the Victor Company, Mr. Grimley held the offices of assistant treasurer and assistant comptroller, and then treasurer and comp-



MR. GRIMLEY

troller. In addition to the duties associated with these offices, he was active in the organization and management of Victor's foreign and domestic subsidiaries. When the Radio-Victor Corporation of America was formed to handle the sales activities of the Radio Corporation of America and the Victor Talking Machine Company, Mr. Grimley was appointed treasurer and comptroller.

DEFOREST EXTENDS RESEARCH

The DeForest Radio Company of Jersey City, N. J., has just received a license from the Federal Radio Commission for the installation of a 5-kilowatt transmitter at its Passaic plant and engineering laboratories. The transmitter will be arranged to operate on C.W. (continuous wave), I.C.W. (interrupted continuous waves), and 'phone (radio telephone). The assigned frequencies are 1604, 2398, 3256, 4795, 6425, 8650, 12850, and 17300 kilocycles, covering a very considerable range of wave lengths from the lower end of the short-wave spectrum to the top end almost within reach of the broadcast wave band.

The transmitter will be employed for research and test purposes, in keeping with the growing activities of the DeForest organization in the radio transmitting field.

POLYMET SOUND

The Polymet Manufacturing Corporation announce earnings of \$2.02 per share for the first quarter on the outstanding 180,000 shares capital stock of the company.

This compares with 50¢ per share earned

in the corresponding quarter of the last fiscal year, Nov. 1st, 1927 to Oct. 31st, 1928.

Net sales for the last quarter, August 1st to October 31st were \$1,739,352.86; profits before deduction of taxes and depreciation were \$423,179.10; net profits after deduction of all taxes and depreciation were \$363,019.18.

These figures place Polymet in new high ground, quadrupling net profits for the previous fiscal year which were \$89,659.34 after deduction for taxes and depreciation.

The outlook for the future continues bright according to the announcement of Mr. Nat. C. Greene, Vice President and Treasurer of the company, with considerable volume of orders on hand and plans for the addition of several new items which should materially increase sales volume.

PLANE CRASHES

Cliff S. Bettinger, sales promotion director, the Temple Corporation, Chicago, recently completed one of the most unique and successful sales promotion exploits in the history of the radio industry. A \$7,500 cabin monoplane which was won by the



Ackerman Electric Co., Temple distributor in Grand Rapids, Mich., was taken on a 10,000 mile trans-continental good-will tour by Mr. Bettinger. The tour ended at the Harlington, Texas airport, when the plane crashed. Mr. Bettinger was hurt altho the plane was only slightly damaged.

RADIO EXPERTS ON INCREASE

Charles J. Hopkins, Manager of the foreign department of the Crosley Radio Corporation of this city, who recently visited South America on the heels of another trip to Italy, Spain, France and England, reports that exports of radio apparatus from the United States have practically doubled within the past year. Improved broadcasting facilities in foreign countries have greatly stimulated the sale of radio receiving sets abroad, he said.

"While it is most gratifying to note that new markets are being opened in different

parts of the world, the business from foreign countries that already have evinced a demand for American radio material is increasing to a considerable extent," he said. "Argentina, Brazil and Chile naturally lead in imports of American radio in the South American countries, but a very healthy demand is now apparent in Peru, Bolivia and Colombia.

"As soon as broadcasting is on a better basis, this demand will increase. In Argentina and Brazil new broadcasting stations of increased power have been established. Some of the American programs are now being received on short wave and re-broadcast through local stations for listeners in those countries. Orchestral and symphony numbers are highly appreciated, although speeches and talks, being made in English, have to be eliminated."

Erection of a new and powerful broadcasting station in Mexico City is contemplated, Hopkins reported. He said that Station WLW, the super-power transmitter operated by the Crosley Radio Corporation in Cincinnati, is now a "local" station in Mexico City and in Havana.

"Radio programs are published in newspapers in both cities daily, as there is no difficulty in receiving these programs continuously," he said. "After all, broadcast programs constitute the life-blood of radio and as more and better programs become available, more radio will be sold. Indications are that our foreign business this year will show an increase of considerably more than one hundred per cent over last year."



Spain and Italy have been the surprises of the radio export trade, Hopkins reported, the business in those countries having increased enormously. South Africa has "opened up" quite recently and China, since the embargo has been lifted, has responded in great shape, he added.

BUSINESS TOPICS

75% of All Radio Sets and Equipment Used Throughout the World is Made in the U. S.

RETURNS TO RADIO

E. N. Rauland, pictured here, has just recently organized The Rauland Corporation in Chicago and will manufacture electrical apparatus including Power Am-



plifiers and Transformers. Mr. Rauland is well known to the industry as founder of the old All American Radio Corp. Associated with him in the new enterprise, as Vice-President, is Donald MacGregor.

BOOK OF FACTS

"Radio Tube Salesmen Made Overnight" or "Putting a Tube Factory in the Salesman's Pocket" might well be the title for the booklet and sales plan now being used by the National Union Radio Corporation.

The booklet referred to has been very carefully prepared from a technical and sales angle and is being supplied to dealers, jobbers and salesmen selling Sonatron Tubes throughout the country.

ARRES-TENNA ANNOUNCEMENT

L. S. Brach Manufacturing Corporation have just placed on the market a product known as "Arres-tenna." In addition to its faculty of resisting lightning induction, it is also used as a socket aerial through the inclusion in the unit of a condenser or filter. Installed in a set it is often found that the socket aerial feature supplies sufficient antenna capacity so that no further wiring is necessary.

INVADES SOUTH AFRICA

The Crosley Radio Corporation announces the appointment of H. Polliack & Co., Ltd., as distributors for Crosley products in South Africa. This company has branches in Johannesburg, Durban and Cape Town and a dealer following in practically every town in the Union of South Africa.

DE FOREST SALES MANAGER

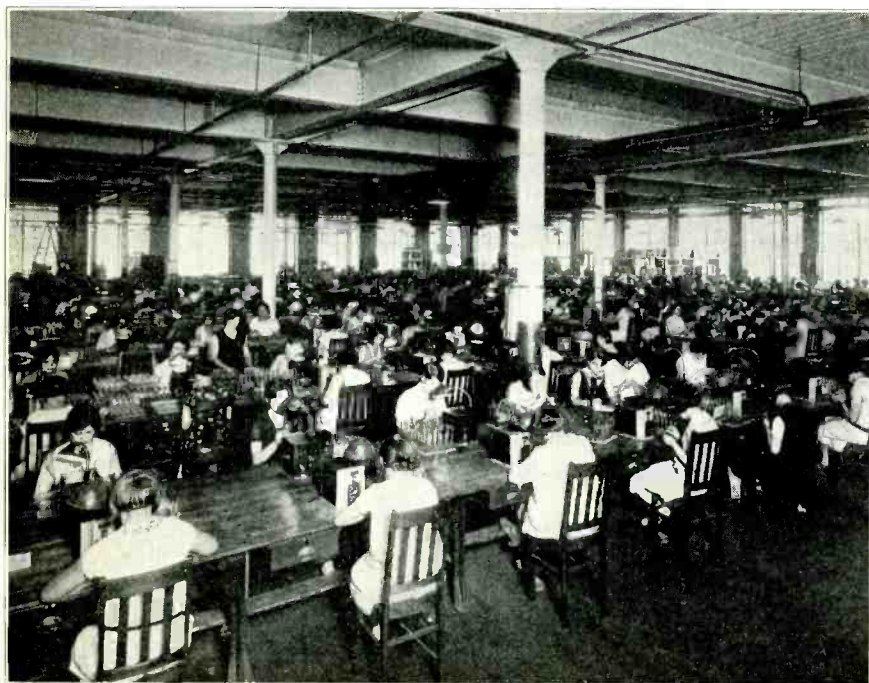
G. J. Hallam has been appointed General Sales Manager of the DeForest Radio Company of Jersey City, N. J., manufacturers of the DeForest audions. Mr. Hallam has resigned as Radio Merchandise



Manager of the Associated Merchandising Corporation of New York City. Prior to that connection, he was Field Sales Manager of C. D. Black & Company of New York City, and General Sales Manager of the Merchandise Division of Sperry & Hutchinson Company of New York.

With a wide experience in radio and general merchandising, Mr. Hallam comes to the DeForest organization at a time when the distribution of radio tubes is becoming increasingly extensive and diversified. Incidentally, he is a pioneer aviator, having piloted airplanes back in the earliest days. He has many friends and contacts in the general merchandising and radio fields, who will welcome him in his present capacity.

MODERN WELL LIGHTED SECTION OF ARCTURUS PLANT



Here is shown a section of the Arcturus radio tube plant at Newark where 180 tubes are made exclusively. Good lighting plays a most important part in this plant.

STEVENS-SIBLEY MOTOR

The Stevens-Sibley electric phonograph motor is unique in that it is non-sparking and has no gears or springs. It runs smoothly and quietly without objectionable hum. The drive is against the outer rim of the turntable, which insures even, balanced movement. It has a speed adjustment, giving all speeds required for correct or modified reproduction. There are no exposed parts, all elements being enclosed in a substantial cast metal housing which is dust and moisture-proof. The motor requires no attention whatever, not even lubrication. The non-sparking feature makes this motor peculiarly desirable for use with electric

pick-ups for the electrical reproduction of records, according to announcement.

The motor is designed to operate on direct current furnished either by standard dry cells, or on stepped-down and rectified alternating current supply. The current drain is so low that long life is assured from a set of dry cells, or again from the dry disk rectifier when operating on A-C socket power.

The Stevens Manufacturing Corporation of Newark, N. J., manufactures not only the Stevens-Sibley motor, which is employed in several A-C and battery portable phonographs, but also the die cast and balanced turntable and motor bracket, making a most convenient unit.

IMPROVING TONE QUALITY

Taking radio testing out of the laboratory for the first time, Powel Crosley, Jr., (standing) Cincinnati manufacturer, has



enlisted the critical services of George Gershwin, famous composer. Miss Alma Gluck, renowned dramatic opera and concert soprano, has been retained by Mr. Crosley for the same purpose. Their advice aids Crosley engineers in developing the tone quality of receiving sets.

NEW FURNELL CONDENSER

The Furnell Sales Corporation of New York announces a new gang condenser having many improvements and features of interest to radio set manufacturers. The various sections of the condenser consist of die cast permanent and movable elements. The concentric flanges interleaving these members affords the tuning capacity. This design eliminates some of the inaccuracies in condenser construction due to variations in thickness, flatness, and spacing of plates in the usual condenser. The first two factors are replaced in the Furnell Condenser by the factor of concentricity. Concentricity can be attained mechanically with great precision. By virtue of this design the capacity ranges of the various sections can be matched to a high degree of accuracy.

Another feature of the condenser is its non-vibratory characteristics. Microphonic regeneration and oscillation are entirely eliminated due to the die cast members.

The Furnell Condenser has been under development for the past few years and the new unit which is being announced is the result of careful tests and experimental production observations. The capacity of the individual units range from 300 to 525 M.M.F. It is interesting to note that no vernier dial is required in as much as a smooth mechanical movement produces a dial rotation of 360 degrees. The metallurgical aspects of the die casting has been studied to such an extent that "buckling" as well as capacity due to the temperature coefficient have been minimized.

FULL STEAM AHEAD

In the face of pessimism in some quarters that the demoralizing upheaval in stocks would possibly have a dampening influence upon the flourishing prosperity of the radio industry, John S. Gorman, vice president of the Gulbransen Company, broadcast a reassuring statement to all Gulbransen jobbers and dealers.

"I have ordered a thirty per cent increase in production," Mr. Gorman said. "Although the stock market upheaval undoubtedly may cause radical readjustment and has affected many concerns, we are going full steam ahead. The tremendous prosperity of this country cannot be seriously affected and we are confident that this present flurry will have a tendency to increase production by solidly financed, progressive manufacturers, and they will reap greater benefits than ever before.

"Our orders for production increase are based solely upon visible demand for Gulbransen products, a demand which we are certain cannot be changed. All signs point to renewed activity in every substantial line of industry."

KENNEDY SALES INSTITUTE

A Sales Institute has been formed by the Colin B. Kennedy Corporation, radio manufacturers of South Bend, Indiana, with

its object as a complete course of instructions for retail salesmen, states an announcement from Wm. B. Nevin, general sales manager of the corporation.

"Our retail sales institute," explained Mr. Nevin, "was formed to aid dealers in instructing their men how to sell radios. The course was written by one of the foremost merchandising men in the country in consultation with Col. George M. Studebaker, Colin B. Kennedy, F. H. Wellington, C. J. Callahan and myself. It is being published in six volumes, and each one handles a different angle of making retail sales.

"We believe our sales course to be the most complete of its kind ever written, and at present, the only course applying exclusively to radio retail sales. One feature of this course is that it does not apply solely to Kennedy radios, but it may be used by retail salesmen to apply to any radio which his store may have for sale."

SEAMLESS TUBING

The National Harris Wire Company has installed additional machinery for the production of Seamless Nickel Tubing for use as cathodes in A-C Heater type radio Tubes. This Seamless Tube offers many advantages and is rapidly replacing the Seamed Tube used in the past.

Seamless Tubing is used in several sizes, the smallest measuring 1/16 of an inch in diameter with a wall .0015 thick, or about the thickness of a sheet of tissue. This very thin wall added many difficulties to the tube drawing technique, and new methods and machinery had to be devised to produce a perfect product.

HAS FIVE PLANTS

The Cable Radio Tube Corporation, with offices and main factory building at 84-90 N. Ninth St., Brooklyn, N. Y., has had to expand into four more factories in order to keep production at the same high peak as sales, according to announcement.

The main SPEED Tube factory is still located in the Greenpoint section of Brooklyn, and is operating at capacity; across the street at 9th St. and Wythe Avenue is located Plant No. 2; a new plant has been set up at North Ninth and Roebing Streets; Plant No. 4 is the Wyckoff Corporation; in Newark, N. J. is the 5th plant, formerly the Tubecraft Corporation.

This unparalleled expansion is not over yet, SPEED executives letting fall a hint that further news of a "growth" nature would be forthcoming shortly.

SHIPPER'S HELPER

The Diagraph Stencil Machine Corp. of St. Louis have just issued a new booklet which they call, "Shipper's Handy Helper." Considerable shipping information is contained together with a listing of about one hundred shipping room items.

LETTERS FROM OUR READERS

TYPICAL REQUEST

Please send me a sample copy of your magazine and advise the subscription rate. Thank you.

Yours very truly,
11-23-29 A. C. TAUBE

NO DEALERS

Radio Industries, formerly Radio Manufacturers Monthly, circulates only to manufacturing executives, engineers and leading jobbers. Our circulation does not include any radio dealers.

Will you kindly indicate on the bottom of this letter which you are, so we can take prompt care of your inquiry.

Cordially yours,
11-26-29 RADIO INDUSTRIES

BOOKS

Will you kindly send us a list of your various technical and production books?

We are particularly interested in a technical book pertaining to photocell, and data on their recent developments, etc.

Trusting that we may receive the above information at an early date, we are

Yours very truly,
R. B. Hanson
F. & H. RADIO LABORATORIES
11-22-29

GOOD IDEA

I am seriously thinking of starting a house-to-house retail business of selling a nationally known brand of incandescent lamps and radio tubes. I would appreciate any advice you may have to offer on an undertaking of this sort, and also, any information that you have as to whether this has been tried before and with what success.

It is my plan to advise the prospective customers along better lighting lines and help them to light their homes properly.

The same, no doubt, holds true regarding radio reception because of obsolete sets and tubes gradually going bad because of short life.

I feel that this would open up a field for other electrical accessories, once goodwill has been established.

Yours very truly,
11-23-29 F. F. BECKER

VARIABLE CONDENSERS

We are in the market for some low price variable Condenser assemblies and would like to know if you could put us in touch with some Manufacturers of units of this type.

Thanking you very kindly for a prompt reply, we are,

Yours very truly,
BORKMAN RADIO CORPORATION.
11-13-29 By F. G. Borkman.

WOULD MANUFACTURE

I will heartily appreciate your cooperation and assistance from your organization and through the media of the *Radio Industries* to publish in your "letter column", that I am interested in coming in contact with responsible manufacturers, jobbers or inventors, who may have small electrical or radio products for assembly where high overhead prohibits of assembling such products.

Also arrangements can be made to distribute such products right here from Philadelphia to their customers whether local or distant points.

Also would be interested to go into full manufacturing business with a responsible manufacturer who desires to start plant in Philadelphia on a partnership basis. My experience in radio and electrical manufacturing field will be of great value in starting manufacture or assembly of their products.

I have built up my manufacturing experience around and through these large companies such as General Electric, Philco, Atwater Kent and the International Resistance Company. The latter, I was connected with their organization as general plant production superintendent.

I have started independently in assembly end of the business and therefore I would like to hear from manufacturers, particularly those west of the rockies, where high cost is prohibiting in competing in this territory.

My desire is to establish a real service to manufacturers, and keep their quality in mind same as they would.

Mr. Darling, I heartily appreciate to have you put this in your news letter page and I sincerely hope to reciprocate by some business with your organization.

Yours truly,
VICTOR ELECTRIC & RADIO
APPLIANCE MFG. CO.

Victor J. Saboja,
Business Manager.
11-4-29

UTONA SPEAKER?

We are interested in the "Utona" Loud Speaker.

Will you good people give us what information you have available on this speaker?

Will you point out in what manner this speaker represents an improvement over prevailing speakers and its consequent advantages?

We shall be extremely grateful.
Yours very truly,
GENERAL LEAD BATTERY &
ELECTRIC CO.

11-23-29 A. J. Galleho

WHO SHOULD PAY?

There has been considerable discussion for years as to who should bear the cost of broadcasting.

I have patiently waited for someone to furnish the obvious answer and as it has not been forthcoming I am taking the liberty to name it as follows—

The electric public utilities should bear the cost through a central committee, particularly the cost of broadcasts of national interest, as such events increase their power consumption enormously, particularly when you realize the humblest electric set consumes the equivalent of a 100 Watt lamp and the better set 200 Watts.

Assuming that we will eventually have at least 25,000,000 electric sets in the United States, you can readily calculate the same means 3,750,000,000 (three billion seven hundred and fifty million) Watts consumption at an average of 150 Watts per set.

The above figures do not include the eventual radio, phonograph, television consumption in both tubes and motors.

Yours very truly,
11-22-29 By W. J. BOWLES

It would seem to the editors of Radio Industries that broadcasting stations are in a sense comparable with the publishers of newspapers and magazines. The newspaper sells for two or three cents and costs many times that amount to publish. The advertising makes the business profitable. In the course of time it is believed that all broadcasting stations will show a reasonable profit from the monies derived from air advertising.

SCHOOLS AND BOOKS

Would like to have some first class information on Radio Engineering Schools.

Also on modern Radio text-books, especially illustrating power facts.

Very truly yours,
11-2-29 FLOYD H. LENGEL.

OUR REPLY

We have your letter of November 2nd, and if you can furnish us with a little more information as to the type of Radio Engineering schools you are interested in, we shall be pleased to help you in making a decision.

From your letter, it is not clear whether you are interested in recognized colleges and universities giving radio courses, or radio trade and correspondence schools.

In regard to modern radio text books, we would suggest that you communicate with John Wiley & Sons, Inc., 440 Fourth Avenue, New York City. There are a multitude of radio books, but we would suggest

that you investigate a book entitled "Principles of Radio Telephony and Telegraphy", by Messrs. Duncan and Drew. This book is published by John Wiley & Sons, Inc. They also have a new book by Prof. Morecroft, of Columbia University, which they will be very pleased to show you.

Very truly yours,
RADIO INDUSTRIES,

W. W. Harper,

11-7-29 Engineering Editor.

LIKES SERVICE ARTICLES

Enclosed herewith please find news items that may prove of interest to your readers.

As you will note this Association is going to issue a publication which is expected to be in the mail by the first of December and in which we plan to quote from your October issue, a part of the articles of Fenner, Harper and Lescarbours.

It is a pleasure to note the space that you have been giving to the service question in your publication and the articles by Mr. Harper have been extremely interesting as well as enlightening. Please extend to Mr. Harper the appreciation of this organization for the good work that he is doing.

Thanking you for your past courtesies, we are

At your service
Radio Service Managers Association.
G. C. Kirchhof.

11-14-29 Executive Secretary

AND THANK YOU

We have received our copy of November 1929 of your magazine *Radio Industries*.

There are two editorials there regarding "The Merchandiser gets his way" and one on "The Screen Grid Question", which we want to bring to the attention of our people abroad.

We want them also to be interested in your magazine, so that they may receive it regularly and peruse it thoroughly.

Will you please, therefore, send a copy of your November issue to the addresses listed on the enclosed sheet and write each a letter calling their attention to those editorials and solicit their subscription. We are sure that most of the people you will address will remit.

Yours very truly,
AD. AURIEMA, INC.

11-12-29 Ad. Auriema
President

MATERIAL WANTED

Will you give us the names and addresses of manufacturers of Nickled Brass binding posts, in large, medium and small sizes? We have been compelled to buy these where we could find them, taking almost anything offered. Everyone tells us that there are a number of manufacturers of these, but no one can give the names or addresses.

We want the names and addresses of manufacturers who make and keep in stock these binding posts, those in or near Chicago preferred.

Is there in Chicago or other city in the middle west, a manufacturer who cuts core pieces or stampings of Silicon Steel for Transformer Cores? Please give the names and addresses of those who do this work.

Very truly yours,

SCOTT COIL & TRANSFORMER CO
11-26-29

By Nat G. Scott

WANTS IT IN ENGLISH

Your last issue of *Radio Industries* promised help in the obtaining of unusual technical publications.

I would like to get an English translation of: *Handbuch der Experimentalphysik*, Edited by Wein-Harms. Vol. XIII Part 2 Glilhelektroden und Technische Electronenröhren by Schottky, Rothe and Simon P. 492; 179 figs.

Akademische Verlagsgesellschaft MBH
Leipzig price bound 46 R. M.

This is all the information I have concerning it. It was reviewed in the May 1929 proceedings of the I. R. E.

I would like to have some idea of the price first of course because 46 R M means nothing to me.

Thanking you for any help you can give, I remain

Yours truly,

11-27-29 Arthur Baldwin.

BRAZIL SCHOOLS INSTALL RADIO

One of the latest advances in the use of radio in teaching is the installation of radio receiving sets in the schools of Sao Paulo, Brazil.

FORD GETS ELECTRICAL EXHIBIT

Henry Ford came to the East Pittsburgh works of the Westinghouse Electric and Manufacturing Company on Tuesday, November 19, to see what is said to be one of the most complete exhibits in existence of pioneer electrical inventions.

During his visit Mr. Ford was presented the entire exhibit which will be placed in the Ford Museum, a permanent industrial exhibit at Dearborn, Michigan. The presentation was made by F. A. Merrick, President, and W. S. Rugg, Vice President of the company.

Approximately 600 different articles comprised the exhibit, most of them being important inventions of the "gay eighties and nineties" that were for the most part developed by Westinghouse engineers.

Most of the articles are priceless relics which money could not buy. They have been gathered from widely separated parts of the country in order to prepare this demonstration of electrical history. Until recently many of the electrical devices rested all but forgotten in dusty lofts and storerooms in East Pittsburgh and other parts of the country.

Great industrial romances, shattered hopes and realized ambitions are represented in the pioneer "dynamos", meters, motors, transformers, lamps, fans and other early articles which make up the exhibit.

1930 GOOD TUBE YEAR

The year 1930 will break all records in radio tube distribution and manufacture. This is the prediction of B. G. Erskine, a Director of the Radio Manufacturers' Association, and President of the Sylvania Products Company.

Erskine says all indications point to a total tube output that will probably exceed one hundred million single units. This, according to Erskine, who is considered one of the nation's leading authorities in the radio industry, will place the radio tube industry among the country's foremost.

"The present year's expenditure for radio tubes will probably involve a national expenditure of one-quarter billion dollars," says Erskine, "and the present outlook can be considered a very favorable barometer reading for the radio industry throughout the approaching year."

TUBE LECTURES

The National Union Radio Corporation is sponsoring a free course of instruction in the principles, construction and operation of radio tubes to be given in a series of Friday night lectures in the New York offices of the Company, 400 Madison Ave., beginning December 6th, according to an announcement.

Professor E. Gordon Taylor, of the Physics Department of the City College of New York, and Chief Consultant Physicist of the National Union Radio Corporation, will conduct the course which is open to radio service men, set engineers, technical school students, and others.

"This course has been instituted because the heads of the National Union Radio Corporation believe that those who work with Radio tubes should have a complete first-hand knowledge regarding them which has heretofore been unavailable in a comprehensive form such as we are now presenting it," said Nathan Chirelstein, president.

"The course will include lectures on such subjects as: The Elementary Laws of Electrostatics and Magnetism; Electric Currents and Methods of Producing Them; Electron Emission from Various Types of Filaments; Ionization of Gases and Electrolytes; Discharge of Electricity Through a Vacuum Tube; Rectifying Tubes and Circuits for Same; Service Men's Difficulties.

"It is believed that these lectures together with question periods and general discussions will give those who enroll a comprehensive picture of radio tube principles and operation which will combine both the theoretical and practical viewpoints."

ASSOCIATION NEWS

RMA Directors to Discuss Merchandising Problems

DIRECTORS MEETING

Radio sales now are increasing after a temporary recession, it is stated by President H. B. Richmond of the Radio Manufacturers Association, in announcing a call for a meeting of the Association's Board of Directors December 6th and 7th, at Briarcliff Lodge, New York. The Directors' meeting is incident to the industrial conferences initiated by President Hoover to stabilize and stimulate business conditions. The radio industry leaders will consider measures to cooperate in the industrial program of the President and will be represented at a meeting called by the U. S. Chamber of Commerce at Washington just prior to the meeting of the Association's board of directors.

Merchandising problems will be foremost on the docket of the radio manufacturers' board meeting at Briarcliff. Reports will be submitted on many recent surveys of the radio market.

"These indicate," said President Richmond of the Radio Manufacturers Association, "that radio sales fell off somewhat during the last fortnight in October coincident with the stock market slump, but now are on the upgrade in the normal busy sales season this time of year. A very few manufacturers reduced prices, but a large majority are maintaining prices while one or two have announced increases. With the recent increase in radio sales, the outlook is encouraging, and for many manufacturers 1929 sales will be much ahead of last year."

At the Briarcliff meeting of the manufacturers' Board of Directors, broadcasting and legislative problems, including the measures pending in Congress to continue the life of the Federal Radio Commission, also will be considered.

INDUSTRY SUPPORTS BROADCASTING

The radio public now receives more entertainment, more broadcast programs, from radio manufacturers than from any other industry.

In the sponsorship of broadcast programs, according to the Radio Manufacturers Association, the radio industry itself now ranks first, with the automotive industry second, and the drug industry third.

In the early pioneer days of broadcasting, except for a few notable exceptions, support for broadcasting from radio manufac-

turers was comparatively small, most manufacturers lacking financial strength for broadcast programs. During the past few years of prosperity in the radio industry these conditions have changed until now the radio industry ranks first in support of broadcast entertainment.

The Radio Manufacturers Association, through its Broadcasting Committee headed by Mr. B. G. Erskine of Emporium, Pennsylvania, has just completed a survey of the support given broadcasting by manufacturer members of the Association. This survey shows that within the last year the number of radio manufacturers broadcasting has about doubled, with a gain of nearly 100 per cent in numbers, as well as time used on the air. Last year fourteen radio companies, members of the Radio Manufacturers Association, were sponsors of weekly programs on the two principal chains of the National Broadcasting Company and the Columbia Broadcasting System. This year twenty-seven companies, members of the Radio Manufacturers Association, enrolled among the sponsors of weekly programs and during the best evening hours.

According to a recent survey of radio broadcasting by *Advertising and Selling* in seventy-three principal cities and of fourteen groups of broadcast stations, the radio, automotive and drug industries were ranked one, two and three in support of broadcasting on the principal national chains. During the first six months of 1929, according to this survey, the radio manufacturers spent almost two millions on programs, nearly twice the expenditures of the next largest radio broadcast sponsor, the automobile industry. The comparative figures secured in the survey were \$1,955,244 and \$1,074,489. These figures are incomplete nationally and in addition many radio manufacturers and jobbers and dealers in the large cities present programs on local broadcast stations in addition to the chain programs of the larger companies. Several large radio manufacturers also own and operate their own broadcast stations, and several other members of the Radio Manufacturers Association have been active in the early experimental broadcasting of television.

The Radio Manufacturers Association's survey disclosed that from three to five broadcast programs sponsored by its member manufacturers are on the air every

night of the week on the two principal national chains. Many of these programs are old established and costly features. A few radio manufacturers give several radio programs weekly, and an annual all-star broadcast feature is presented in connection with the annual Convention and Trade Show of the Radio Manufacturers Association.

As compared with the fourteen radio manufacturers broadcasting in 1928, the twenty-seven companies sponsoring programs this year, about equally divided on the two principal national chains, are listed alphabetically:

All-American Mohawk Corp.; F. A. D. Andrea (Fada) Co.; Atwater Kent Mfg. Co.; Bremer Tully Manufacturing Co.; CeCo Manufacturing Co.; Earl-Freed Company; Thomas A. Edison, Inc.; Gold Seal Electric Co.; Graybar Electric Co.; Grigsby-Grunow (Majestic) Co.; Gulbransen Company; Kellogg Switchboard Supply Co.; Ken-Rad Corporation; Kolster Radio Corp.; Marvin Radio Tube Corp.; National Carbon (Eveready) Co.; Philadelphia Storage Battery (Philco) Co.; Radio-Victor Corp.; Sonatron Tube Co.; Sonora Phonograph Co.; Stromberg-Carlson Mfg. Co.; Sylvania Products Co.; Temple Corporation; Tower Mfg. Corp.; Triad Mfg. Co.; United Reproducers Corp. and the U. S. Radio & Television (Apex) Co.

DISCUSS TUBE STANDARDS

A meeting of the Standards Committee on Vacuum Tubes of the Radio Manufacturers Association was held in New York recently. George Lewis presided as Chairman. The following members of the committee were present:

Charles O. Cressey, CeCo Manufacturing Company; Allar B. DuMont, DeForest Radio Company; F. H. Engle, Radio-Victor Corporation; C. W. Haller, Hygrade Lamp Company; Frederick Holborn, Gold Seal Manufacturing Company; Walter Krahl, Arcturus Radio Tube Company; George H. Perryman, Perryman Electric Company; T. F. Stromeier, Cable Radio Tube Corporation; Barnet S. Trott, Earl Radio Corporation, and Roger Williams, Triad Manufacturing Company.

Guests included were: R. J. Erickson, Colonial Radio Corporation; A. J. Marino, Gilby Wire Company and Harold L. Olesen, Jewell Electrical Instrument Company.

The various discussions included: Revision of Existing Standards; Revision of Rating of 280 Rectifier Tube; Standard Characteristics for Tubes; Standard Methods of Measuring Tube Characteristics; Grid Heater Capacity of Screen Grid Tube; An Approved Form of Life Test; Instruction Sheets and Marketing of Tube Cartons; A Standard Method of Identifying Vacuum Tubes; Method of Delivering Heater Time of Indirectly Heated Cathode Tubes and Dealer Method of Determining the Merit of a Vacuum Tube.

The Chairman described the activities of the Vacuum Tube Committee extending back some four years in an effort to devise an accepted method of designating or identifying vacuum tubes.

It was clearly indicated by the discussion that no attempts be made to change existing numbers but that a simplified system of model or pattern numbers be developed and included upon cartons in addition to existing numbers as, for example, a carton would contain:

(a) *The manufacturer's name and trademark.*

(b) *The present number (say UX 201-A), and the new pattern number (say X-SZ tube.)*

Should the new pattern number be selected with caution and wisdom, it was considered that the old numbers would cease to become used and the new numbers would gradually become universally accepted.

Due to the lengthy discussion of the subject and the amount of interest shown, it was moved by Mr. Olesen and seconded by Dr. Holborn, "that a committee be appointed to draw up a tentative system of code numbers or code letters for this purpose and that you refer to this Committee the work which you have done in the past on this same subject, and that the Subcommittee report back to the Committee as a whole at its next meeting, or by mail." The Chair appointed:

Harold L. Olesen, Chairman
J. V. Cappicotto
M. F. Flanagan
Dr. James D. Jordan
Austin Lescarboursa.

GEDDES SPEAKS

The radio industry is enjoying one of its biggest and most prosperous years and is now in the billion dollar class, according to Bond Geddes, Executive Vice President of the Radio Manufacturers Association. In an address recently before the Annual Convention of the National Association of Broadcasters, Mr. Geddes said that sound estimates of radio sales this year range from \$750,000,000 to \$1,000,000,000 and with no saturation points in sight. Broadcast chains and stations, he said, also are prosperous, together with radio distributors.

Plans for cooperation between broad-

casting and manufacturing interests, in the interest of the radio public, to have national events, especially of sports, such as baseball and boxing contests, on the air, were outlined by Mr. Geddes. The broadcasters and manufacturers, he said, are working together to insure the reduction on the air of such outstanding radio features of public interest.

Declaring that radio advertising, through commercial sponsorship is no longer an experiment but of proven value, the speaker said that undue commercialism in sponsors' announcements was being reduced gradually as radio advertising was becoming better understood.

NEMA ELECTS

New officers and governors were elected, a new managing director appointed and six trade practice conferences were held under the auspices of the Federal Trade Commission during the third annual meeting of the NEMA in Washington recently.

Clarence L. Collens, president of the Reliance Electric and Engineering Company of Cleveland, was elected to succeed Huntington B. Crouse as President of the Association. R. H. Goodwillie was reelected Treasurer and Messrs. S. L. Nicholson, Westinghouse Electric & Manufacturing Company, New York; Charles H. Strawbridge, Goodman Manufacturing Company, Chicago; W. E. Sprackling, Anaconda Wire & Cable Company, New York; D. R. Bullen, General Electric Company, Schenectady, N. Y., and Louis B. F. Raycroft, Electric Storage Battery Company, Philadelphia, were elected Vice-Presidents, and are given in the order of their seniority, which was determined by lot.

A. W. Berresford was named as managing director to succeed Alfred E. Waller, who resigned. Mr. Berresford, president of the American Engineering Council, has long been identified with the electrical industry. Since 1896 he has held executive positions with many large electrical concerns. He is a past-president of the American Institute of Electrical Engineers, the Electrical Manufacturers Club, the Associated Manufacturers of Electrical Supplies and a member of the American Society of Mechanical Engineers, the Society of Naval Architects and Marine Engineers.

—R. S. M. A. EXPANDS

At a meeting of the Board of Directors of the Radio Service Managers Ass'n held at its headquarters, 324 West 42nd Street, New York City, a resolution was passed providing for the expansion of the R. S. M. A. through the organization of branch Associations in other large cities.

Service managers who are interested in forming such an Association in their locality, are urged to communicate with Mr. Grover C. Kirchhof, executive secretary of the R. S. M. A. who will be pleased to

supply any information that may be required.

The executive office of the R. S. M. A. will supply branch Associations with complete sets of examination questions and answers as well as all necessary forms such as certification cards, office record cards, etc. at a very nominal cost and will supply, for local distribution to members necessary, copies of "THE RADIO SERVICE MAN" which is the official publication of the Radio Service Managers Association and will, beginning December 1st., be issued monthly by that organization.

All non-resident members of record of the R. S. M. A. will have their membership transferred to the branch Association that is nearest to their home. All certification cards issued to service men who are associate members of the R. S. M. A., or any of its branch organizations, will be interchangeable so that one who has passed his examination in one city and secured his certification card can go to another city and, through that card, be reasonably sure of securing employment.

Each branch organization will have one official representative for each 25 members enrolled, who will attend the annual meeting of the R. S. M. A. and have full power to vote on all questions at that meeting. There will also be one contributing editor appointed by each branch who will gather and pass upon all news items or other matter that may be of interest to the radio service field and forward all such material to the home office of the R. S. M. A. in New York City.

The fee to be paid by branch Associations shall be \$1.00 per member per year with a fixed minimum of \$25.00. Local officers will be elected by each branch organization and each branch will be a unit unto itself, responsible only to the main body. No financial responsibility will be assumed for such branch organizations by the main body or any other branch Association.

All branch Associations will be subject to the By-Laws of the Radio Service Managers Association.

NEW WAVE LENGTH

The Television broadcasting station of the Jenkins Television Corporation, W2XCR, has changed its wave length effective at once, by authority of the Federal Radio Commission, to 107 meters, or a frequency of 2800 K. C. in the 2750 to 2850 band. The change has been made from the former frequency of 21500 K. C., or 139.5 meters, because of interference with other television stations in the vicinity.

According to D. E. Replogle, Assistant to the President of the Jenkins Television Corporation, Station W2XCR will continue to be on the air with its program broadcasting from 3 to 5 in the afternoon, and from 8 to 10 at night, until further notice.

EDITORIAL EDDIES



Being Backwash Bickerings and Cross Currents of Comment on the Incoming Tide of Thought

By F. ROMER
Industrial Cheer Leader

WHAT kind of men made radio possible? How have they differed from other men? Their history is the record of men who put dreams above dollars. Von Guericke, who made the first electric machine, was a burgomaster experimenting for the love of it. Musschenbroeck, on whose jar for storing electricity the condenser is based, was a teacher of physics and mathematics driven by a zest for exploring further into the mystery of the new force. Ohm, whose name is given to the measurement of "resistance" by a conductor of current, sacrificed his position and standing to fight for his discovery. Michael Faraday, to whose genius motor, magneto and dynamo are credited, served as valet for Sir Humphrey Davy to get experience in the laboratory. The list is long—over two hundred men vital to the final discovery of radio are mentioned in R. P. Clarkson's "Hysterical Background of Radio." They were all men of courage, ideals, fighters against stagnation, believers in the fitness of man for greater trust upon the part of the Apportioner of Nature's Secrets—and warriors for the riches of knowledge rather than for personal riches. The money reward may induce a man to sacrifice temporarily to gain a goal he knows others, too, can see—but prospective money reward isn't enough to drive him toward a goal that he alone can see; one which, even after he reached it, he could scarcely get others to concede that it had been reached.



THE olden days penalized a man for thinking beyond boundaries set by fear and prejudice. Modern conditions reward him for pressing onward. In the past, to deny that a common belief was correct, was heretical and punishable. To seek beyond what was known, was beckoning the wrath of deity. The man of yesterday who dared to describe his conception of a world with television in every home, would have been burned or beaten to death. His statement that world events would be brought across limitless distances and materialized out of the air would have created panic. The pedagogues would have preached the dread portent of a legless, footless world. They'd point out that with no need to transport the body, its supports would dwindle, shrivel and be discarded. The man of today may prophesy the transmission of thought even without electrical energy, the nourishment of the body without eating, the birth of children with the fully developed

intellects of philosophers, residence on estates developed on planes anchored by "gravity-counterizers" above the clouds, week-end trips to North Pole Resorts from New York by projectile transportation—and his prophecy simply sets ready, eager, scientific minds to work upon the problems his idea presents. Attitude of mind alone limits latitude of accomplishment.



IN Washington this month, the first actors to give a performance for transmission by television, went into rehearsal under the direction of Dr. C. Francis Jenkins. While this was not a performance for other than what might be termed laboratory tests, it was significant of the rapid strides to be expected now in this direction of television. Radio is the world's fastest changing industry. It is creating a new type of inventor—a new type of industrialist—and a new type of merchandizer. Each must think with spontaneity. Deliberation is dead. Swift decision, fast action, is the new order, yet missteps must be fewer than when cautious consideration checked each move, for the competition shoots by with terrific velocity when inventive skill, industrial competence or merchandizing ingenuity falters a single footstep. The pace is speedier but the rewards come sooner; life brings more experiences; more mysteries are being solved, more adventures are encountered, so romance still flourishes and perhaps more happiness for all is everywhere, for greater benefits are on every hand in every land. It's a greater world.

"THE chief difference in good copy now and twenty years ago," says a celebrated sales doctor, "is in a technical improvement of layout and copy expression, and the use of more ingenuity to get attention because of the greater amount of advertising run in all mediums." Ingenuity that flags the reader's galloping gaze, and hooks your fact-freighted phrase on to his train of thought—is what puts you on the main line headed for more sales.

MEN WHO HAVE MADE RADIO

NATHANIEL C. GREENE

Vice President and Treasurer
POLYMET MANUFACTURING CORPORATION

TAKE a walk along East 134th Street in New York City. As you approach the river, suddenly a well-known emblem flashes into view, emblazoned on a great new factory—the famous Polymet seal. It is the new plant of the Polymet Manufacturing Corporation, known throughout the industry as specialists in the manufacture of good radio set essentials.

The average outsider asked on what that building was constructed, might say, "on a foundation of bed-rock". He would be wrong. That building was constructed on a foundation of a stronger material than bed-rock—the strongest known to man—Quality. Unyielding, unrelenting quality has always been built into Polymet Products and in turn quality has built Polymet. But, no factory or company can operate by itself or adopt policies of its own accord. That must be done by the guiding spirit, the man behind the gun. No one in radio needs any introduction to the guiding spirit, the motivating force behind Polymet and the quality synonymous with that name. It is Nathaniel C. Greene, known by everyone as just plain "Nat".

Back in 1924, Mr. Greene had the vision to foresee that radio could not continue as an experimental toy, or a slipshod, go-as-you-please little industry. Five years ago he first drew the parallel between radio and the automobile, their similarity of appeal, their logically parallel development, and that is the picture that Mr. Greene keeps constantly before him today, now that radio is come of age. Names like Timken, Bendix, Continental are as much a part of the automotive industry as are Cadillac, Packard, or Stutz. As specialists in certain highly important automobile accessories, no manufacturer can afford to neglect them. They have established themselves in the mind of the public as manufacturers of quality products, and as such, their equipment on a car is an additional selling point for the dealer. Radio, Mr. Greene has always felt, must develop in the same way. Specialists in certain essentials of the radio must parallel the automotive specialist. His product will achieve the importance and acceptance of the automobile accessory in time, and become a tangible sales point with which to approach the consumer. Polymet, or Mr. Greene, the two are indivisible, have long adhered to this picture and the truth of this prognostication has already made itself felt. Slowly but surely Polymet Products are becoming known to the consumer. Advertising is helping, quality is helping even more. The manufacturers have seen the wisdom of leaving special parts to specialists who can turn them out better and cheaper, thanks to large volume, than ever they could themselves—and particularly when those parts carry with them a real acceptance by the dealer and the public.

It reads like a fairy story, this short but crowded history of Polymet and its guiding wizard—Nathaniel C. Greene. From the tiny Lafayette St. plant employing 25

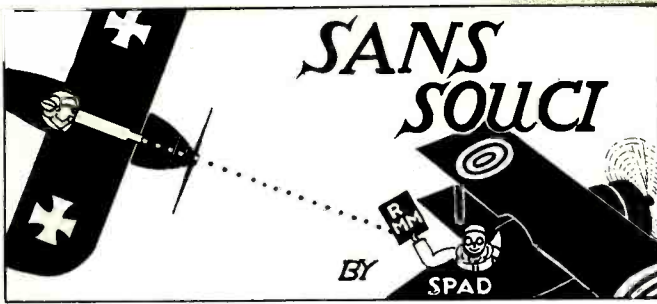
persons in 1924, hesitantly turning out a few phone plugs a day, to the enormous factory on 134th St. today, employing well over 800 hands and turning out thousands on thousands of filter blocks, by-pass condensers, mica condensers, resistances, rheostats, volume controls, etc., every day, to keep the great set manufacturers that Polymet supplies on production schedule.



NATHANIEL C. GREENE

And that's not all—for while dynamos hum in New York, still others are humming in Easton, Pa., where coils by the carload—Poly-Coils they are—are turned out in a plant employing another 500 people. Still other dynamos are humming in Winsted, Ct., a third Polymet Plant, where enamelled magnet wire is manufactured for use in Poly-Coils, the latest Polymet Product.

And there at his desk in New York sits the man whose untiring, dynamic spirit brought this all about—Nathaniel C. Greene. Every business day, as he begins to read over the morning mail, sometimes long hours before opening time, perhaps he smiles to himself, a little pleased smile of pardonable pride. For here, in five short years, is a loft become three huge factories; a phone plug business, a huge radio set essential corporation. And Quality did it all. Yes, Quality, and perseverance, and hard work, and most of all, that indomitable, unquenchable spirit of Polymet "Nat".



We see that the Chicago Fire Department has entered the chain store field. Their various stations throughout the city are very cleverly equipped with very large neon signs advertising their wares. Anyone in the market for a good fire would have little difficulty in finding one of their branch stores, for the brilliant red "Fire Station" is easily visible. We mention this in this column because, obviously, it opens up a new market for high vacuum and transformer products. It is rumored that the city officials are somewhat displeased with the present signs, they feel that they are not up-to-the-minute. We hear they are considering a change to a more modernistic sign of three colors carrying the words "Fire Shoppe" in old English script. With this change we may expect furniture manufacturers and interior decorators to get a break in furnishing the various station houses. No doubt Elizabethan or Early American periods would be most attractive.

* *

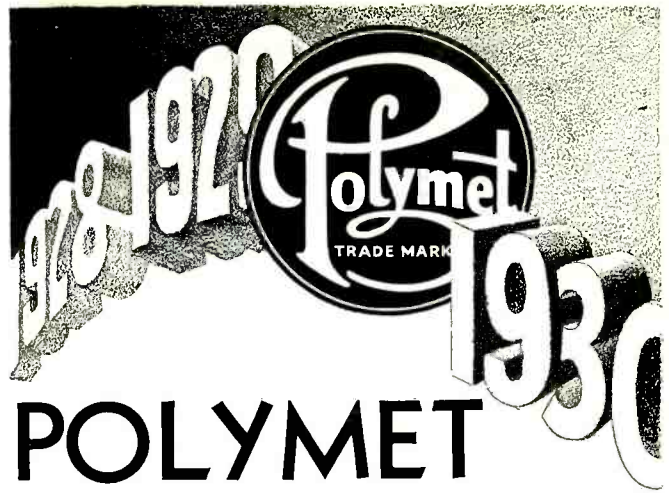
There seems to have been a little slump in the radio business of late. It differs only slightly from other slumps which the radio industry has experienced, excepting that the present one is a little bigger and better. It will probably be of only slight duration, however, in as much as everyone is getting their financial matters arranged for even a bigger slump next year. There is no doubt that we must all work hard to make next years slump the biggest on record. From present indications success is almost guaranteed. We thought that the world had emphatically demonstrated the mettle and courage of the average American, but the undiminishing effectiveness with which some manufacturers go in for this radio slumping business is probably the greatest example of American fighting spirit of all times. The reckless and fool hearty manner in which they face radio punishment reminds me very much of the English Army officer's order to hold his position at all costs. In extending battle orders to his Sergeant Major he was asked what arrangements would be made in case they were overwhelmed by the enemy. The officer replied sharply that the order was to "stand their ground." But the Sergeant Major pointed out that they might be surrounded—what then? The officer's quick and nonchalant reply was, "In that case we will simply advance and win the war." The manufacturer who is being refinanced in order to enable him to advance and win the market should do much serious thinking before taking the step. We are not talking against the radio industry nor are we inviting anybody to get out. It is simply common sense to stop fighting an overwhelming enemy. The weak manufacturer and the radio industry will both be better off when fool hearty enthusiasm and fanatical courage are replaced with good business judgment. Radio failure is bitter medicine but it is a sure cure for industrial instability and further losses.

* *

An Eastern engineer has predicted that sandy beaches along the ocean front may be a source of radio interference. My Gawd—must we prohibit bathing beaches in order that radio will not be disturbed? It seems to me that they are carrying a good thing a little too far. If it is necessary to give subcutaneous injections to the sun in order to keep it from having "spots", hold the heaviside layer down with weights to keep it from wagging, and prohibit bathing beaches—well, it is a helluva note and I shall have light wines and beer.

* *

People get in trouble lying about their neighbors but they'd get in more if they told the truth about them.



POLYMET

puts another year behind
... the greatest in its history

Over 80% of all the radio manufacturers have turned to Polymet in 1929 for standard radio essentials for incorporation in their sets. But December 31st ends nothing but a calendar; January 1st begins nothing but another.

Starting right where 1929 leaves off, Polymet will strive in 1930 to occupy an even more dominating position in the radio parts industry than ever before, by the simple expedient of offering to radio manufacturers the same unapproachable Quality, incomparable Service, and unexampled Dependability in

CONDENSERS
RESISTANCES
COILS
and other

POLYMET PRODUCTS

Polymet Manufacturing Corp.
833 East 134th Street New York



These posters have been seen by millions

During October and November more than four thousand De Forest Audion posters have been displayed in practically every important trading center in the United States.

When a manufacturer installs or recommends De Forest Audions for use in his radio sets, he immediately finds that he is giving an added value to his product at no increase in its cost. He is turning to his own profit a goodwill created for De Forest Audions by the most extensive advertising campaign ever undertaken for radio tubes. Through the medium of magazines, newspapers, nation wide broadcasting programs and billboards, the name De Forest Audions has become a household word.

No matter how excellent a set you make it, the final test of its qualities will depend upon the tubes. You are safe in depending on De Forest Audions because they have set the world's standard for twenty-three years.

De Forest
AUDIONS

DE FOREST RADIO CO., Jersey City, N. J.

Say You Saw It in Radio Industries

WITH THOSE WHO SELL

The M & M Company of Cleveland, Sparton distributors, recently held dealer sales conventions in Cleveland, Akron and Youngstown, with six hundred in attendance, all in the same week.

* *

Ozburn-Abston Company, Crosley distributors with headquarters at Memphis, have just added their fifth branch which is located at Tupelo, Miss.

* *

Capt. William McElroy, District Sales Manager, Radio Division of the Gulbransen Company, announces the appointment of the following wholesale distributors, who will handle the Gulbransen Radio Receiving sets in his territory: O. M. C. Supply Company, Pittsburgh, Pa.; Elliot & Waddington Co., New Castle, Pa.; Smith & Phillips Music Co., E. Liverpool, O.; Greer & Laing, Wheeling, W. Va.; Ohio Battery & Ignition Co., Canton, O.; Geo. Byers Sons, Inc., Columbus, O. and Rich Electric Sales, Inc., Cleveland, O.

* *

The Amrad Radio Corporation will hereafter be represented in the state of New Jersey by Joseph F. Melici, who for eight years has been with the piano firm of Wissner & Sons, Inc.

* *

Otto N. Frankfort, vice-president of the All-American Mohawk Corporation, announces the appointment of two new Lyric distributors. They are the Duke City Electric Distributing Co. of Albuquerque, N. Mex., and the Acme Company of Birmingham, Ala.

* *

Several sales appointments are announced by Colin B. Kennedy Corporation and they include D. R. McKinnon, to be field sales manager; Carl A. Buchner, district manager for Connecticut; W. A. Gray, district manager for Northern Ohio and Ernest H. Young, factory sales representative for Southern California.

* *

The Standard Battery & Electric Company, Iowa distributors for the Crosley Radio Corporation, have opened up a fourth branch which is located at Mason City.

* *

Ashton Deveer Inc., Boston, have been named distributors for Marvin radio tubes according to Ayers-Lyon Corporation, New England factory representatives.

* *

The major part of the state of Connecticut is the territory allotted Sprague Electrical Supply Company of Waterbury, as new distributors of Edison Radio.

* *

A. D. Strathy, Director of Sales for the Cable Radio Tube Corporation, announces the appointment of Maury Spiro as district sales representative for the Philadelphia territory.

* *

E. E. Rhoads, Assistant Sales Manager of the Atwater Kent Mfg. Co., recently attended a three day sales conference of south-eastern representatives which was held at Atlanta.

* *

A sales office and warehouse has been established in Chicago by the Van Horne Tube Company. It is located at 108 West Lake Street and will take care of all western business.

* *

"Radio Talks" is the name of a 28 page booklet written by David M. Trilling and published by the well known Zenith distributing firm of Trilling & Montague of Philadelphia. The booklet has been so carefully thought out and compiled that the dealer's salesman need only memorize its contents. He should have no difficulty in making sales.

Nott-Atwater Company, Spokane, are the new distributors in that territory for Steinite Radio.

* *

W. C. Heaton, Sales Promotion Manager for Zenith, announces the appointment of the Charleston (W. Va.) Hardware Co., as distributors for West Virginia and eastern Kentucky.

* *

C. M. McIntosh has been named Pacific Coast Manager of the Cable Radio Tube Corporation with headquarters at Los Angeles.

* *

William B. Nevin, General Sales Manager of the Colin B. Kennedy Corporation, is back at his desk in South Bend, Indiana after an extended trip through the Middle West.

* *

The Alabama Electric Supply Company of Birmingham have been appointed state distributors for the Gulbransen Radio.

* *

The Perryman Electric Company has announced the appointment of nine new distributors. The Alliance Motor Corporation of Rochester, N. Y., with offices in Buffalo, Syracuse, Rochester and Binghamton, will cover upper New York State. The New England Distributing Co. of Boston, Mass., with offices in Boston, Portland, Springfield and Worcester, will take care of Northern New England. Weinberg and Co., Chicago, will serve the Metropolitan District of this City. The Atlanta Sales Co., with offices in Atlanta, Ga., and North and South Carolina, will serve Perryman dealers in that territory. Walter Ashe Co., and the Lance Electric Co., both located in St. Louis, Mo., will serve dealers there. The Belmont Corp., Minneapolis, Minn., will cover the central part of the State, while the Hanson-Duluth Co., of Duluth, will take care of the Northeast section of Minnesota. The Atlas Player Roll Co., with headquarters in Newark, N. J., will serve the Perryman dealers in New Jersey, Philadelphia and sections of Boston, where they have offices.

* *

A nation wide Distributors Sales Contest, beginning December 1st, and held monthly thereafter, has just been announced by the Atwater Kent Sales Promotion Department.

* *

Wm. B. Nevin, General Sales Manager of the Colin B. Kennedy Corporation, announces the appointment of the following distributors:

Vehicle Supply Co., Cairo, Ill.; Sylvania Radio Co., Altoona, Pa.; John S. Maxson, Syracuse, New York.; H. & K. Distributing Co., Toledo, Ohio.; Schram & Ware, Seattle, Wash.; Thomson-Diggs, Sacramento, Cal.; Dakota-Kennedy Radio Co., Wahpeton, N. D.; Peerless Light Company of the Pacific, San Francisco, Cal.; Devlin Motor Supply Co., Havre, Mont. and E. J. Sheehan Co., Bridgeport, Conn.

* *

L. E. Peterson has been made factory representative for Crosley Radio Corporation with headquarters at Omaha.

* *

Charles J. Parker, formerly General Manager of the Western Motor Supply Co., Minneapolis, has opened a distributing house in Minneapolis under his own name and has secured, as a principal line, Bosch Radio.

* *

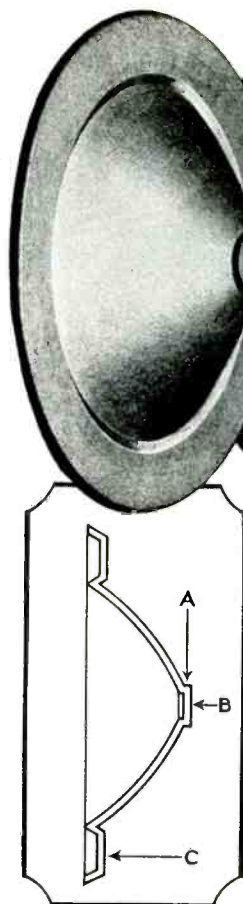
The radio division of the Gulbransen Company of Chicago announces the appointment of the following new jobbers: Braiterman Fedder Company, Baltimore; Colonial Electric Supply Co., Philadelphia; North Coast Electric Company of Portland, Oregon, and Seattle and Tacoma, Washington, and Smith-Hassler-Sturm Co., Indianapolis.

* *

Boss—Look here, what did you mean by telling me you had had five year's experience in selling radio when you never even had a job before?

Youth—Well, you advertised for a man with imagination!

Say You Saw It in Radio Industries



- A. Voice coil collar
- B. Flexing Member
- C. Masking Member

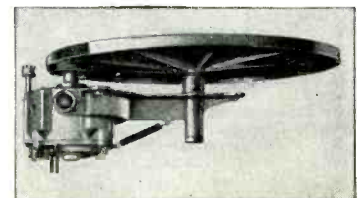
**STEVENS-SIBLEY
ELECTRIC
PHONOGRAPH MOTOR**
*offering many superior
and exclusive features.*

MOTOR: The motor is of the impulse type and is unique in that it is non-sparking and has no gears or springs. It runs smoothly and quietly without objectionable hum. The drive is against the outer rim of the turntable which insures even, balanced movement. It has a speed adjustment giving all speeds required for correct or modified reproduction. There are no exposed parts, all elements are enclosed in a substantial cast metal housing which is dust and moisture-proof. The motor requires no attention whatever, not even lubrication. The non-sparking feature makes this motor peculiarly desirable for use with electric pickups for electric reproduction of records.

PATENTED
Burtex Diaphragms
are licensed and manufactured under patent numbers:
1,414,801 1,414,802
1,414,803 1,414,804
1,454,504 1,506,160
and
1,729,407 issued Sept. 24th, 1929
Other Patents Pending

8 REASONS WHY
MILLIONS OF
BURTEX
DIAPHRAGMS
Have Been Installed in the
Radio Sets Produced by Leading
Manufacturers:

1. Burtex Diaphragms are of one piece construction.
2. Burtex is lighter and stronger than any known paper material.
3. Burtex is impervious to climatical changes.
4. The voice coil collar and mask are integral with the Diaphragm itself.
5. The voice coil collar can be used as a flexing and mounting device—saving the cost of the cone in assembly.
6. The mask is readily adaptable to any installation.
7. Burtex Diaphragms are acknowledged and acclaimed by leading manufacturers and engineers as the finest sound radiators on the market.
8. Burtex Diaphragms are made in a variety of sizes. Special designs can be manufactured to suit any requirements.



**STEVENS-SIBLEY
MOTOR ASSEMBLY**

STEVENS MANUFACTURING CORP.

42-48 Spring Street—Newark, N. J.



When CONTROL Is Everything

Storm, sleet, fog, darkness...the airplane pilot must "carry on".

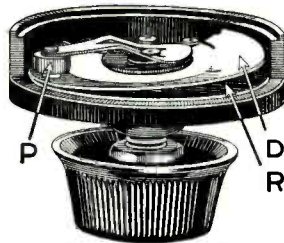
At such a time Control is everything.

Your radio must "carry on" whenever you snap the switch.

Your control (volume control) must function smoothly...easily...consistently if you would be rewarded with clear-sounding entertainment. Your radio will do just that if it is **CENTRALAB** equipped.

Write for free booklet
 "Volume Controls, Voltage Controls, their uses."

This shows the exclusive rocking disc construction of Centralab volume control. "R" is the resistance. Contact disc "D" has only a rocking action on the resistance. Pressure arm "P" together with shaft and bushing is fully insulated.



Pat. Nos. 1,653,745-1,660,897-1,704,154.
 Others pending



The tailor uses the same principle as Centralab. He does not want to ruin the garment by placing the iron on it so he places a cloth in between. Centralab controls can not ruin the resistance because the rocking disc is in between the pressure arm and the resistance.



This is the action of the usual wire wound control after it has been in use for sometime...like dragging a stick over a cobblestone pavement.

Centralab

CENTRAL RADIO LABORATORIES
 20 Keefe Ave. Milwaukee, Wis.

ENGINEERING PERSONALITIES

Roger M. Wise, an eminent tube engineer, has taught a new game of solitaire to the frequenters of the Sylvania Club at Emporium, Pa. If you ask us about it, the game can not be beaten, but it is an excellent pastime as the members of the club have found.

* *

Wally Evans, formerly connected with radio station KYW in Chicago and now on the engineering staff of Westinghouse Electric and Manufacturing company at East Pittsburgh, Pa., finds himself around his old haunts a great deal of the time while supervising the installation of the new transmitter which KYW is soon to put in operation.

* *

Dr. Fred W. Kranz of the United Reproducers corporation commutes regularly between St. Charles, Illinois, Ann Arbor, Michigan, and Springfield, Ohio.

* *

D. E. Replogle, assistant to the president of Jenkins Television corporation, is the proud father of a new son. All concerned are reported doing well.

* *

L. A. Hyland, who has charge of aircraft radio development at the U. S. Naval Research laboratory at Bellevue, D. C., was the guest of our associate editor, K. A. Hathaway, at Wilmington, Del., recently while making observations on the new Bellanca airplane owned by The Chicago Daily News with which it is intended to carry on extensive experiments in radio apparatus for commercial aircraft.

* *

N. E. Wunderlich of the Audio Vision Appliance Company recently presented a paper before the Radio Club of America entitled "Sensitivity Measurements and Performance Tests on Radio Receivers in Production."

* *

Walter Lyons formerly radio engineer for the Balkeitt Radio Company has joined the engineering staff of Universal Wireless Communication Company.

* *

Merwin Ells, director of communication for National Air Transport, recently presented a paper before the Chicago section of the Institute of Radio Engineers. Mr. H. Diamond of the Bureau of Standards was originally scheduled to give the paper. In flying from Washington to Chicago his plane was forced down at Cleveland and conditions prevented completing the trip. The subject which Mr. Diamond would have presented dealt with aircraft radio beacons. Mr. Ells gave an interesting resume of the subject in the absence of Mr. Diamond.

* *

V. Ford Greaves of United Reproducer recently delivered a paper before the Radio Engineers Club of Chicago entitled "Geophysical Prospecting." The paper discussed various methods for the location of ore bodies by means of radio goniometry.

* *

E. A. Wike formerly radio engineer with Balkeitt Radio Company is now connected with the experimental department of the Universal Wireless Communication Company.

* *

R. E. H. Carpenter of London, England is in the United States on business at the present time. His transactions relate to certain radio engineering matters in New York and Chicago.

* *

W. R. G. Baker, at present in charge of radio engineering and manufacturing at Schenectady with the General Electric Company, has been appointed vice-president in charge of engineering of the newly formed RCA Victor Corp. with headquarters at Camden, N. J.

Important Announcement

“A New” Wright-De Coster Reproducer for the Home



Model 117 Jr. Table Style

It has the same fine tone quality—the same truthful reproduction—and is equal in every respect, excepting in volume, to the large theatrical model. It has ample volume for the home or for the small halls.

Manufacturers, Jobbers
and Dealers

Write for Descriptive
Matter and Address of
District Sales Office



Model 117 Jr. Consollette Style

WRIGHT-DE COSTER, INC.

2221 University Ave., St. Paul, Minn.

GENERAL BUSINESS CONDITIONS INDICATE SOUNDNESS OF INDUSTRIES

The collapse of stock speculation has overshadowed all other events in business during the past month. Violent as has been the decline and serious as have been the losses of individuals, we do not believe the fundamentals of the business situation have been changed. The losses have been losses to individuals, not losses reducing the country's productive capacity. The country's farms, mines, mills and factories are intact.

The loans and gains of individuals in the stock market are at each other's expense, not affecting the aggregate wealth of the country. They arise out of a redistribution of ownership in the corporations, and while it is deplorable that redistribution should occur in such a ruthless manner, the industries themselves are only incidentally affected.

The high prices that have ruled on the stock exchange have not been the cause of business activity, but a reflection of it, magnified by more or less extravagant expectations which induced the speculating public to extend itself beyond its means. While reports of slackening business in certain lines of industry may have been one factor in the final break, the main cause was in the condition of the market itself. All over the country general business is proceeding in healthy and orderly fashion which is in marked contrast with the chaotic conditions in the stock market.

Recent reports from the industries have been favorable, indicating that a confidence is unimpaired. The accumulation of stock in the automobile industry and slowing down of production is fully accounted for in the

record-breaking activity of the first half of the year, and such decline as has occurred in the steel industry is accounted for by the slackening in automobile production. The same is largely true of the radio industry. Stocks have accumulated. The radio industry is favored however since the season for radio enthusiasm and best reception is at hand.

For the past year the growing stringency in money has been the chief authority, and this situation is now promised relief by a subsidence of the abnormal demand for speculation. This provides Finance Companies with the cheap money necessary to finance installment sales and will be a great boon to radio sales at this time.

That consumer purchasing power will be hurt in numerous individual cases of course is true, but observation has taught that whether the misfortune be a hurricane, a great conflagration, or a stock market crash, the first impressions almost invariably exaggerate the true extent of the damage. Never before in the history of the country have our industries been better fortified as to cash, condition of inventory, or soundness of corporate structure. There has been no inflation of commodity prices to require correction; no crisis in the banking system to aggravate the situation.



Says you, "Take a letter, Miss Secretary. *Radio Industries*, Gentlemen: Please enter my (or our) subscription to your publication and send statement to cover." Says we, "Thank you sir!"

Say You Saw It in Radio Industries

A SURVEY OF RADIO MERCHANDISING

(Continued from page 430)



MILLIONS READ WHAT THIS MAN WRITES

Millions have mailed requests for his booklets. He calls his stories of products "Buyographies." From Keratol Hideless Leather and Stetson Hats to Colt Revolvers and Brambach Pianos, Mr. Romer has woven manufacturing romance into sales literature. As our staff member, have him

**Tell Your Story as a
BUYOGRAPHY
A MULTIPLE PAGE AD-FEATURE
IN THIS MAGAZINE
And 10,000 Art Booklet Reprints**

The distinctions, advantages and desirability of your product will get across with verbal velocity that gives your message sales-making momentum. Get rates on this Combination Offer — write today.

Radio Industries, 520 N. Michigan Ave., Chicago, Ill.

sets. However, the other side of the question is upheld by some manufacturers with arguments to the effect that the supplying of tubes by the manufacturer with the sets would sponsor *complete* price quotations, enable the jobber and dealer to get *complete* sets from one source of supply and on one billing, discourage the use of inferior tubes, assure the maximum performance of the sets and minimize service charges to the consumer caused by defective tubes. The compromise view would limit the supply of tubes with sets to those jobbers only who cannot get tube franchises.

Each manufacturer is trying to gain and hold the good will and cooperation not only of those jobbers and dealers who are at present handling his products, but also of those who may gain phenomenal success with some one else's product and wish to include another line. Some manufacturers are getting close cooperation, others are at loggerheads with their jobbers and dealers — dependent to some extent on the aid given by the manufacturer to his outlets in the selling of his products.

Most of the manufacturers are fairly well satisfied with the support they are getting from the jobber and dealer. Suggestions for improvement, however, are numerous. The jobber and dealer could do a better job by reducing the number of lines they handle, by paying closer attention to manufacturers' policies and sales suggestions, by not dropping the lines that they handle every time they see a more highly advertised one. Going from one line to another as they splurge in advertising campaigns makes for unreliability. A. H. Grebe & Company, Inc., complains that the average jobber's sales force is made of order takers who follow the line of least resistance. The radio business requires, according to this house, an aggressive merchandising and advertising plan, and the use to best advantage by jobbers and dealers of all merchandising helps furnished by the manufacturer. Another company suggests that jobbers handle lines other than radio as well, in order to make it worth while for them to hire several salesmen and service men to cover the field. And the Radio Products Corporation voices the opinion that jobbers and dealers are all "up in the air" due to numerous rumors of mergers, price-cuts, new jobs, television sets, etcetera, all of which is due to the manufacturers giving out premature laboratory information, each striving for a *coupe d'etat*. The industry should coordinate and organize itself, and get away from the infighting, which eventually acts as a boomerang. In the end, the success of the manufacturer depends to a large degree upon that of his dealers.

Manufacturers might do worse than to consider the problems and opinions set forth in this article, and come to some definite conclusions.

An Ideal Hotel for You!

A fine hotel . . . where homelike comfort is coupled with modern accommodation. A perfectly located hotel . . . surrounded by luxurious private grounds on the shores of Lake Michigan . . . and yet, just 8 minutes to the city-center. 600 unusually spacious, beautifully furnished, cheerful outside rooms with bath. Attractive rates. Every department under expert supervision. Dining rooms with Chicago's finest meals at moderate prices . . . table d'hote or a la carte. Stop here when you come to Chicago. You will be happy at the Chicago Beach!

Write for rates and literature

Chicago Beach Hotel

A. G. PULVER, Vice Pres. & Gen. Mgr.
Hyde Park Boulevard . . . on the Lake,
Chicago



EXTRA COPIES

If you want extra copies of this issue please order promptly, as our supply is frequently exhausted a week after date of issue.

CANDIDATES FRONT AND CENTER

Miss Arcturus challenges the rest of Radio Tubedom to a beauty



contest. Miss Blanche Hudson of the mounting department is the prettiest girl in Arcurus' seven plants.



RADIO SALES 14% AHEAD OF LAST YEAR

Sales of radio equipment during the first three quarters of 1929 reached a total of \$360,897,207, with the biggest quarter of the year yet to be heard from, during which, in past years, 40 percent of the industry's sales are usually made, according to figures deduced from the Department of Commerce quarterly survey of dealer stocks and sales, compiled with the co-operation of the National Electrical Manufacturers Association. An analysis of the survey made by Edgar H. Felix, radio consultant to the Association, further indicates that during the last quarter of the year, dealers need achieve only 42 percent of the total sales indicated by their performance up to October 1st, to equal last year's sales totals, an all time record for the industry. The sales for the third quarter were 14 percent ahead of those for the corresponding quarter of last year.

The stocks of receiving sets in the hands of dealers on October 1st, 1929, averaged 15 per dealer, as compared with 13 at the same date last year. This modest increase of stocks is more than offset by recent price reductions and conservative buying for the Christmas trade, assuring a healthy dealer position. Manufacturers, likewise, have carefully adjusted production to consumer sales in spite of increased manufacturing facilities, with the result that well managed companies are in an ideal position, so far as inventories are concerned.

Say You Saw It in Radio Industries

**Now~
automatic
wave length control!**

Accurate retention of a specific wave length depends on temperature control of the Piezo Crystal. . . . The Cinco De Khotinsky Bimetallic Thermoregulator now being rapidly adopted by leading broadcasting stations, is perfectly suited to this purpose. Regulated for control at any desired temperature, it's action is sure, instantaneous and automatic.

For Full Information Write to
DIVISION OF RADIO ENGINEERING
Central Scientific Company
Ohio St. and Lake Shore Drive, Chicago

+ DAY-FLUX



Non-Corrosive Soldering Flux

Instruments and coil windings which test perfect at the time of manufacture sometimes fail a few months later because of a corrosive action at the point of solder. Some of the largest radio manufacturers avoid corrosion hazards by using Day-Flux for all soldered connections on fine wires.

SAFETY FIRST

Day-Flux eliminates this danger point. It has no chemical action after the connection has been completed. Test its effectiveness for yourself. A liberal working sample will be sent without charge or obligation. Write today.



Safe FOR
DELICATE
WIRING

JAMES B. DAY & CO.



1872 CLYBOURN AVENUE, CHICAGO

FOREIGN TRADE

in the Radio Industry

A tremendous market for American radio sets and equipment exists throughout the world. There is large demand for tubes, transformers, condensers, speakers, wire, rheostats, resistances, chassis, cabinets, etc. Sales are easy to make and highly profitable.

If you are not now getting your full share of foreign sales, we will gladly tell you how, without any obligation.

Write, wire, or telephone.

Chicago Foreign Traders Corp.

Room 740, 410 So. Michigan Ave.

Chicago, Illinois

Phone—Wabash 0484

RADIO IN FOREIGN TRADE—II

(Continued from page 434)

524.00 which we exported to Brazil during the same year. The principal business firms of the country are located in Montevideo, and as a rule they require an exclusive franchise when importing. The practice of some American firms of granting Buenos Aires importers distribution for Uruguay is frowned upon by importers in the latter country, and should be avoided. Alternating current, 220 volts, 50 cycles, is used in Montevideo.

Venezuela has a population of about 3,000,000 and an area of 394,000 square miles. The principal cities are Caracas, Ciudad Bolivar, Maracaibo, Puerto Cabello, and Valencia. There is a broadcasting station at Caracas, the only one in the country. The purchasing power of the average Venezuelan is low, although the advent of American oil companies in the Maracaibo region has had a tendency to raise it. Alternating current, 110 volts, 50 and 60 cycles, is in general use. During 1928 the United States exported radio products to Venezuela to the amount of \$17,726.00.



WELCOME TO FRISCO

After a very comfortable trip by air from Philadelphia, Sayre M. Ramsdell, Sales Promotion Manager of Philco, alights from the ship cabin in San Francisco to be greeted by C. L. McWhorter, Pacific Coast Manager for Philco.



Mr. Ramsdell remained in the west for several weeks visiting the various Philco branches on his return east.

* *

Delegate *Radio Industries* to do some of your thinking. Read every issue for ideas which might be helpful in solving some of your business problems. \$3.00 will cover your subscription for a year.

Chicago's
Newest Hotels

St. Clair Hotel

5 Minutes' Walk to the Loop
Ohio and St. Clair Streets
Telephone: Superior 4660
Garage in connection—
plenty of free parking space



Hotel Eastgate

*Just a Whisper
from the Loop*

Ontario St., one block
east of Michigan

Moderate Rates

Lower than Loop Hotels

Telephone: Superior 3580

G. M. RADIO CORP. HOLD CONVENTION

The first convention of district managers of the newly organized General Motors Radio Corporation was held last month at the company's plant in Dayton, with John E. Grimm, Jr., vice president and director of sales, in charge.

The district managers were introduced to the new officials of the company, R. J. Emmert, president and general manager and for several years a General Motors executive; Mr. Grimm, who comes to the company from the Chevrolet Motor company, of which he was advertising manager; Charles T. Lawson, general sales manager, formerly of the Day Fan Electric company, and E. E. Rothman, advertising manager. R. H. Grant vice president in charge of sales of General Motors was present and addressed the meeting.



Officials attending first convention of district managers of General Motors Radio Conference. Upper row, left to right—Charles T. Lawson, general sales manager; E. E. Rothman, advertising manager; John F. Reeder, Campbell-Ewald Co., advertising counsel. Lower row, left to right—John E. Grimm, Jr., vice president and director of sales; R. H. Grant, vice president in charge of sales of General Motors; R. J. Emmert, president and general manager.

Plans for 1930 selling were outlined and it was announced that the General Motors Radio corporation would continue the manufacture of the Day Fan Radio receivers. Advertising plans were outlined by Mr. Rothman and W. A. P. John, vice president of the Campbell-Ewald company, the company's advertising counsel. The company's advertising policy, it was announced, would be to handle all advertising on a controlled basis for both distributors and dealers, which met the approval of all district managers and officials present.

At a banquet at the Van Cleve Hotel, Mr. Emmert outlined the engineering and manufacturing plans of the company, reiterating the keynote of "building for the future by building right."

The convention was brought to a close with an address by R. H. Grant, who discussed the future of the radio business as seen by General Motors.

Sound Reproduction Improved By Perryman Laboratories



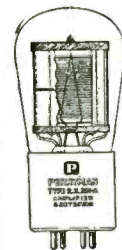
PERRYMAN Engineers can assist you with your own immediate tube problems. Their judgment is based on wide experience—their report on your particular needs is unbiased, and their work is in the strictest confidence. They will save you worry and expense.

Submit your problem in writing, giving complete details. Your letter will receive our immediate attention. The recommendation of our laboratories will be forwarded within one week.

The Tube with the Patented Perryman Bridge



Hudson Boulevard, North Bergen, N. J.



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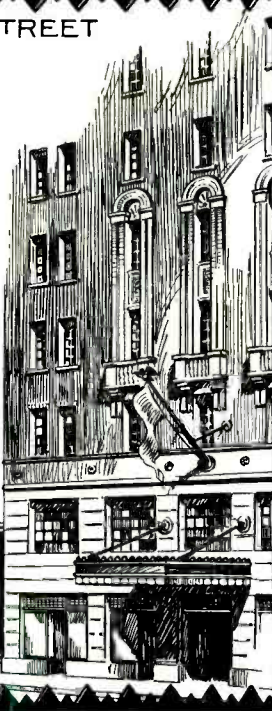
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Managing Director

RADIO IN EVERY ROOM

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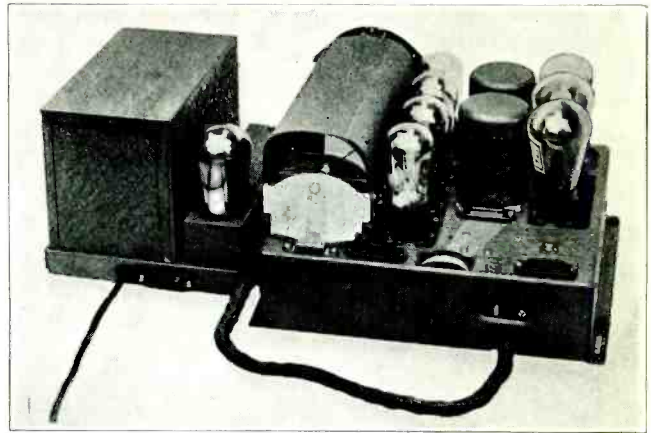


PIONEER MANUFACTURER INTRODUCES NEW CHASSIS

Twenty-one years in the radio industry is an almost unheard of record for any manufacturer. Its significance is more apparent when it is realized that broadcasting, which made radio popular, is only about nine years old.

Brandes holds that record. In 1908 the famous Brandes headsets were first used for wireless messages.

Now that broadcast reception has become a practical necessity for every home, Brandes is bringing its 21 years of experience into the designing of radio sets, and continuing its fine reputation.



Here is the Brandes chassis built into a low-priced receiver. From left to right are the power pack, the 380 rectifier tube, the four condensers shielded and turned by one control, the three radio frequency stages and detector in a row of 327 tubes, two shielded audio transformers, one stage of audio frequency and two 245 tubes in push-pull power amplification.

The radio frequency transformers are placed under the panel, to make the set more compact. Four leads from the set are attached to the special Brandes speaker installed in the same cabinet, which gives the natural tone that is making these sets popular.



IMPORTANCE OF BAFFLE

One of the most important factors in sound reception is baffling, by which any loud speaker is improved, especially in the timbre of low frequencies, due to its being fastened to a solid object. This statement is made by Clifford E. Stevens, Chief Engineer of the Stevens Manufacturing Corporation, in discussing loud-speakers. According to the same statement, the old horn speaker, being directional, had no back-lash, a characteristic of the cone speaker, which, though slightly directional, sets up wave trains from the rear as well as the front. The resulting distortion or fuzz is neutralized by the baffle, which, in the modern console, is the front of the cabinet, while the four sides, being evenly spaced from the speaker, tend to reflect and neutralize at dead center the waves set up by the rear convex surface of the cone. But a solid back does not allow air to escape, a space of from two to six inches being generally sufficient to avoid interior distortion. In the average console this means that about 1/8 of the rear surface of the cabinet would remain open. In some receivers this outlet is given a three-fold purpose, as an air escape, to provide a heat outlet for the power units, and to give a complete view of the tubes.

ABOUT COUPONS

* * * * * At that crucial and delightful moment, if you could only be there in person, you could hand your prospect a fountain pen and an order blank and he would thank you for the opportunity to sign on the dotted line.

But alas, you can't be there in person, so you seek the next best thing. If the nature of your proposition permits, you supply him—through a coupon—with some kind of order blank and pray that he will produce his own fountain pen. Your coupon tells him you expect to hear from him. It provides an added incentive to action. It is a big factor in overcoming his inertia. It saves him both the time and the trouble required to get out his stationery and write you a letter. It removes all reason for hesitating—and getting lost.—Printers Ink.

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My duty is clear. I take my pen in hand in answer to your prayer. You may send your bill for subscription.

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Mailing Address

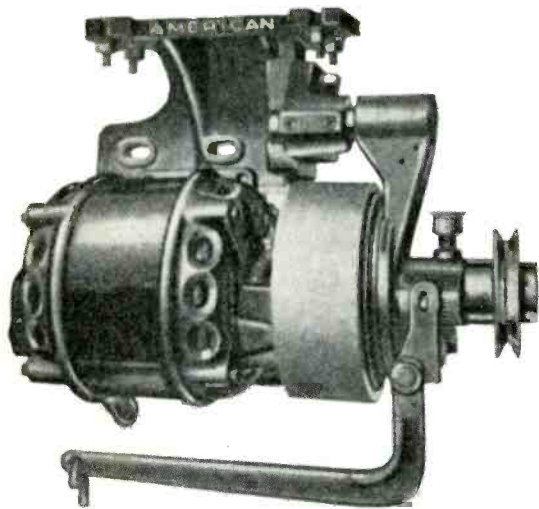
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It means Economy and Efficiency. The positive control of the "American" Electric Drive assures slow or quick starting and stopping. Equipped with motors from 1/6 H.P. upward.

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Covering Production, Engineering and Distribution in Radio, Television and Sound Projection

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RADIO Industries

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520 North Michigan Ave.
CHICAGO

The first signer of the Constitution of the United States started something when he affixed his signature to that tremendously significant and historical document. Ever since then we have been asked to put our John Hancock here, there and where not. *Radio Industries* is asking you to put your John Hancock and address on the blank below. You will be assured your copy of *Radio Industries* each month as it comes from the press. Better have it delivered to your home.

Enter my name on your list for the next One Year, \$3.00
and I will remit upon receipt of bill. (or check enclosed) Two Years, 5.00

Name Executive Position
Firm Product
Mailing Address
City State

Say You Saw It in Radio Industries



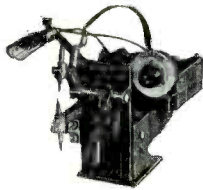
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Radio Tube Machinery

Ever since the advent of Radio Tubes, Eisler Electric has been the radio tube manufacturers' standard. For, built in every Eisler Electric machine is the best quality of material and finest workmanship human skill can produce.

Illustrated at the right, is the Eisler Electric Spot Welder. Thousands of these machines are daily employed for assembling of radio tubes.



Eisler Electric Corporation

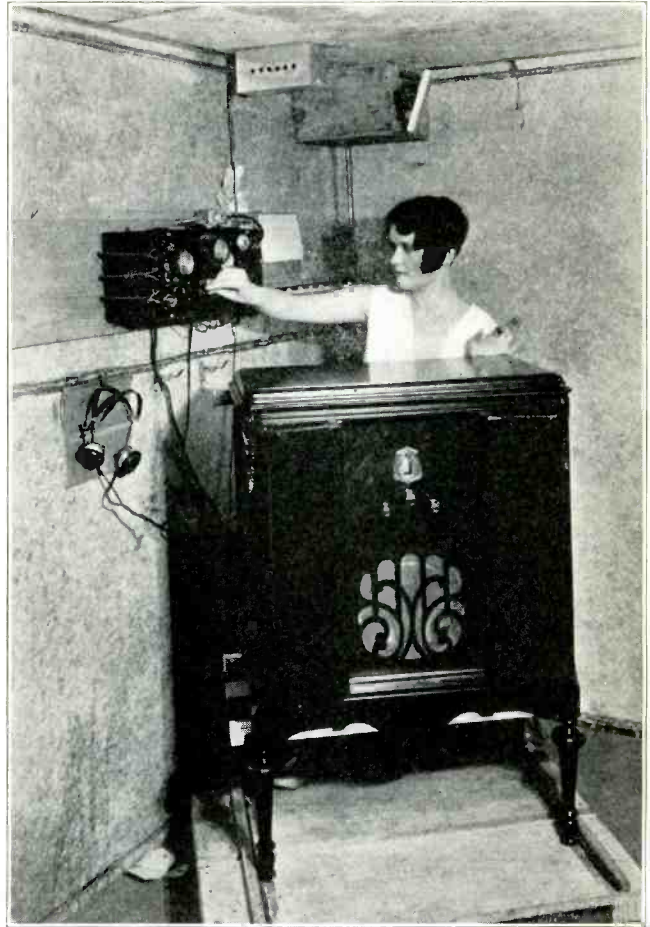
Successors to the Eisler Engineering Co., Inc.

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Newark, N. J.

FAST WORKER

The old adage that red-haired girls are fast workers is borne out by the record of this pretty miss with the Titian



tresses. She inspects 130 receiving sets a day at the new plant of the Crosley Radio Corporation in Cincinnati.



HATHAWAY VISITS INCA PLANT

Fort Wayne is the possessor of another new radio factory, one that has been occupied less than two weeks and which even today is not completely furnished for full production. The Inca Manufacturing company, another source of enameled wire and transformer windings, organized during the summer months, has just completed the first unit of its new manufacturing plant a short distance from another new radio factory operated by the Stenite Radio corporation.

Ever since the new company announced its formation there has been a question concerning the derivation of the name. There seemed no way in which the combination could be derived from either the location of the factory nor the names of the founders. It is named after the Inca Indians, a tribe of South American Indians considered to have been the first inhabitants of the earth to have successfully worked copper and brass. The facts underlying the situation are well known to those in the metallurgical field.

The new Inca factory which is now constructed is about 400 feet in length and extends back 200 feet, giving a floor space under a single roof of 80,000 square feet, most of which is used for manufacturing purposes. Another addition to the factory joining the present building

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DINING
ROOM
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COFFEE
SHOP**

**ELIZABETH
STREET EAST
AT
WOODWARD
AVENUE**

and of the same design and size is being built. The entire plant will have, then, at least 150,000 square feet of space available for manufacturing, with the other 10,000 square feet for offices, etc.

The power plant at the present time is equipped with a single modern boiler capable of taking care of the entire plant built and under construction and has facilities for expansion as the size of the organization increases requiring more factory space.

The equipment used in a wiredrawing and enameling plant has been developed to a point where it seems that nothing can be done to make it more efficient. The wire is gradually drawn down from a bar through the swaging process, where the copper bars are heated and pounded into long rods and then drawn through several sets of diamond dies until a wire of the proper size is obtained.

The constant drawing of the wire through the diamond dies wears the diamonds so that they have to be ground occasionally. Machines for grinding the diamond dies consist of cam-driven needles that work around through the hole in the die and use the particles of diamond dust that wear off as the abrasive material for shaping the hole again. The die then is a little larger than before the grinding and is placed a step further along the line of dies.

The enameling machines are for the most part ovens in which the enamel applied by passing the wire through a pan of the mixture is dried before the next coat is put on. Seven to eight coats of enamel are applied to magnet wire used in the manufacture of radio apparatus.

The wire that comes from the enameling ovens must be thoroughly inspected for quality of the insulation, diameter of the bare wire and thickness of the insulating coating. Passing the inspection department, the wire is sent to the stockroom preparatory to shipment.

The new equipment in place in the new modern Inca factory building presented a picture worth viewing. It marks another step in the industry that has made the most rapid strides of any in the history of the world.

FINDS MARKET FOR WASTE MATERIALS

The reclaimed-materials organization at the Western Electric Co.'s Hawthorne (Chicago) works now handles and sells about \$7,000,000 worth of reclaimed waste annually, according to an article appearing in *Class and Industrial Marketing*, by D. W. Gee, manager reclaimed-materials division, Western Electric Co. This type of marketing has been characterized as "harvesting the hidden profits of a business," and is truly a constructive marketing job.

The metallic sweepings alone are worth \$100,000 annually. Metal shearings in odd-shaped sizes are used in the manufacture of toys. A chemical by-product is hepta-aldehyde. The old wooden lays used on cable spools are sold to Chicago bakers, because the blaze from the wood makes an even heat for baking bread. Rubber shavings go to make bowling balls. Switchboard wire is dipped in paraffin and sold to radio manufacturers. Discarded tires from the motor fleet, if they have any semblance of tread left, are purchased by a dealer who ships them to Portugal, where they are cut into suitable lengths and used in the manufacture of footwear. Very little of Hawthorne's scrap is sold to junk men. Low-grade material is disposed of in this way.



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Our tubes are accurately built of finest materials only. We insist upon quality first—still our prices are interesting.

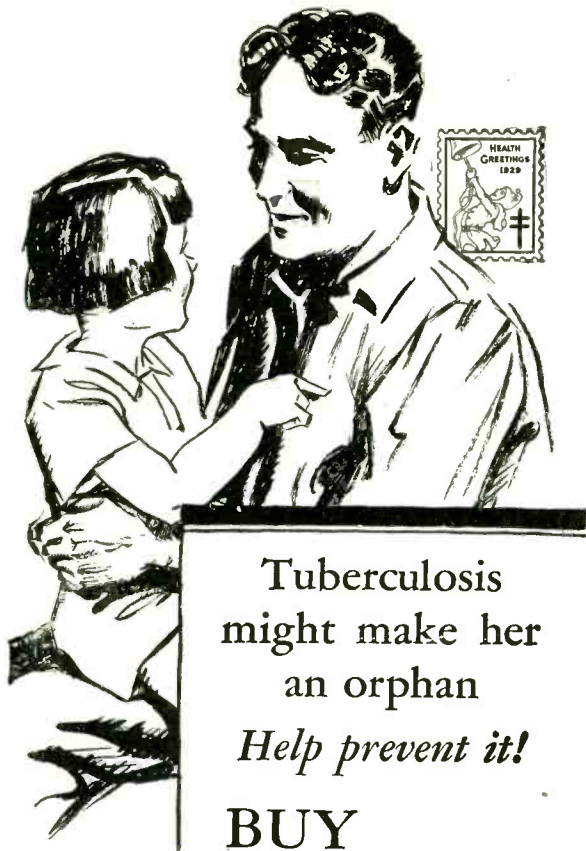
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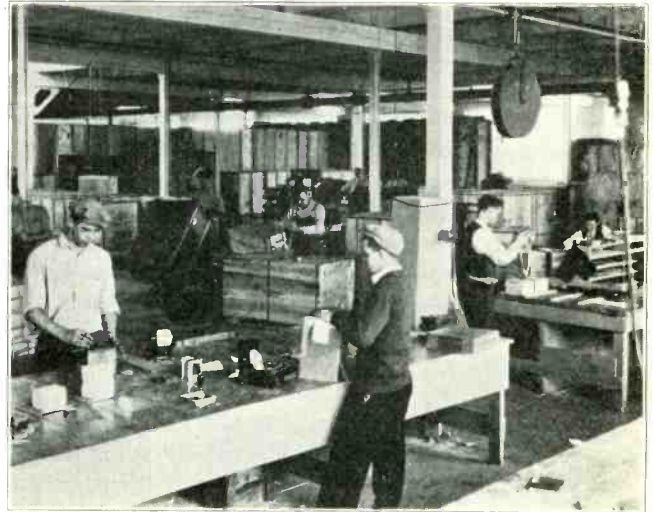
New York's new hotel truly expressive of the greatest city. 1200 pleasant rooms each with Servidor, bath, circulating ice water and radio provisions.

Rooms from \$3.00 General Manager **E. G. KILL,**

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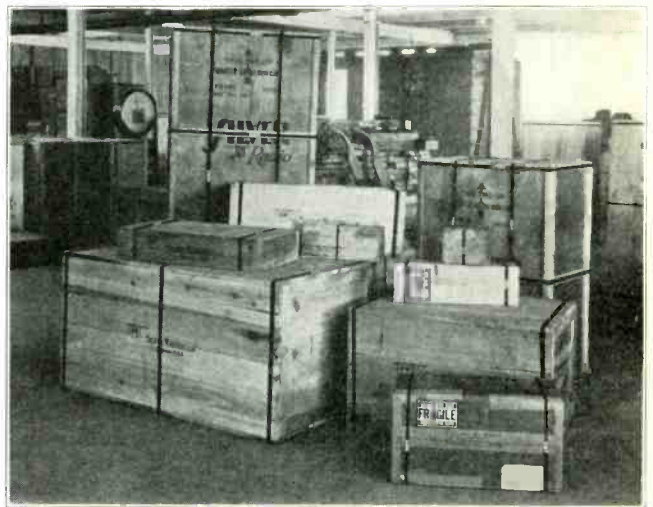
SHIPPING AID

Several years ago radio manufacturers were faced with many shipping problems. Various forms of shipping containers were used. Crystal sets and the small essential radio parts could be shipped in fiber containers. Even now radio parts, speakers and the like are still shipped in fiber as well as plywood and the heavier wooden containers. There does not seem to be any standardized material for the shipping container. The manufacturer buys the best container obtainable for his needs and the one which he believes most economical.



This photograph shows men in the shipping room of Silver-Marshall, Inc. applying Synode steel straps to the various packages about to be shipped

Plywood containers seem to be logical for the shipping of console radio sets. They are light in weight, tough in construction and not considered expensive. For export purposes especially, many manufacturers feel



The wide range of containers safeguarded with Synode are here shown. Even the heaviest cases require only 3.4 inch shooks effecting an important saving in the cost of lumber and freight weight. The use of Synode permits the use of very light lumber or plywood as shown in the back of the photograph

the need of using heavy wooden containers. That is mostly a matter of personal preference. In the long run the cost varies only little.

To make the package more endurable and as a means

of guarding against breakage some manufacturers are using steel strapping. For the same purpose, wire is frequently used but the majority of plants have found steel straps much more adaptable.

In an interview with R. A. Burkhardt, superintendent of shipping for Silver-Marshall, Inc., Chicago, recently, we learned some things about the use of steel strapping in shipping which might be interesting to our readers. Mr. Burkhardt said, "We first adopted Synode (a form of steel strapping manufactured by the Synode Steel Strapping Co. of Chicago) as an export necessity; then found it so good that we used it on all domestic shipments as well. Before we discovered Synode we used to nail steel bands onto our cases. We also tried wire. It used to take 30 to 45 minutes to the case. Now we Synode-strap a case, and nail staples over the straps in 15 minutes. And, of course the Synode-strapped cases, boxes, and cartons travel better and reach our customers, at home and abroad, in much better condition. And, above all, stealing has largely stopped. That is a sore spot with all makers of radio parts who don't use Synode."



SECTION OF NEW CROSLLEY PLANT

The new eight-story addition to the plant of the Crosley Radio



Corporation is so spacious that as many as 600 employes can work on set assembly on a single floor.



1929 STANDARDS YEARBOOK

The new Standards Yearbook for 1929 is the third annual issue of a publication devoted to the great and growing field of standardization in its broad aspects. It is a 400-page summary of progress.

Standardization is a world-wide movement. It covers all industries. It is part of the application of scientific methods to industry. Its achievements are of interest and concern to business men and manufacturers as well as to engineers. To the technician it is full of examples of methods and results of suggestive and stimulating value. To business men it discloses trends which deeply concern their interest. *Copies are available at \$1.00 each from the Supt. of Documents, Government Printing Office, Washington, D. C.*

HORSE SENSE

Radio dealers and radio set owners do not buy factory equipment nor can they be thought of as prospective purchasers of the various materials which go into radio manufacture.

But one publication—*Radio Industries*—is edited exclusively for and circulates to radio manufacturers. In every plant the most thorough coverage is made. The editors receive as many letters from Chief Engineers and Purchasing Agents as come from Presidents and Sales Managers. The subscription list, too, is made up of every type of executive. *Radio Industries* is read by the "higher-ups" and those who aspire to major executive positions. All have their share of influence in the ultimate purchase of your product.

In your sales plans for 1930 include an advertising campaign in *Radio Industries*. Let your advertising message go directly to all manufacturing executives in the industry. And, remember, there is but one publication for you to use. Shall we prove it?

Advertising Department

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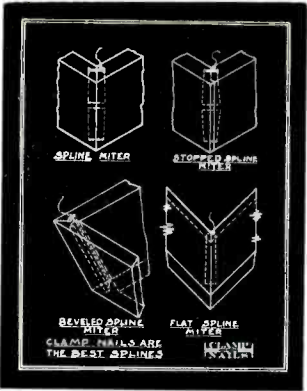
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WHAT IS A "SCREEN-GRID"—AND WHY?— A STATEMENT

By FRANK AIKEN

Chief Engineer Atwater Kent Manufacturing Company

Since the announcement of this important radio improvement last spring, "screen-grid" has become a common term in radio discussions, but one which few are able to explain. Everyone knows the advantages it brings—super amplification, greater selectivity and longer range—but a few know just how these are achieved.

Despite the profusion of words which have endeavored to set forth the ABC of the screen-grid principle and the host of electrical terms inevitably employed in such explanations, it is by no means necessary for one to be an electrical engineer in order to comprehend the function of the screen-grid. Nor must an explanation be accompanied by cryptic drawings and cabalistic designs which are presumed to clarify it.

The screen-grid is an improvement both in the tubes employed in a receiving set and in the structure operating with the tubes. The purposes of the vacuum tubes in a receiver are to serve as a check valve or filter for radio currents or signals passing through them and also as amplifiers for these feeble currents. The signals should proceed in one direction only, without any "backwash" or reverse flow of the current. When such a reverse flow or leakage occurs, as in old style tubes, it results in the loud howls, squealings and whistles which are heard through the radio speaker.

The tube used prior to the introduction of the screen-grid was called a three-element tube. It was found impossible for this tube to serve as a perfect check valve and to prevent the conflicting reverse flow of the current. The tiny path which allowed the leakage reverse current to return through the tube could not be eliminated.

The screen-grid was consequently evolved. This is a four-element tube equipped with an additional section, the screen grid itself, which effectively blocks the reverse flow of the radio current. The signal passes through in one direction only and there is no leakage as there was in the three-element tube. This delicate sifting of the sound waves, without the usual conflicting reverse flow, affords the higher amplification, greater selectivity and range.

Owing to the greater amplification, fewer screen-grid tubes are needed than was the case with the old three-element tube and—obviously—fewer parts are needed. Six ordinary three-element tubes would be required to do the work of three screen-grid tubes.

One of the biggest factors in all radio sets is volume control. The screen-grid tube allows us to control not only the in-put to the first tube from the antennae but also to control the amplification of the set itself. When you are receiving a strong station the tube noises are reduced because the amplification of the set is reduced, thus giving a new type of volume control.

The control of volume is a problem which does not seem so obvious on the surface. However, when one considers that the radio set receives a signal that has travelled 2,000 miles and increases it to an audible signal in the loud speaker, and the next instant takes a strong signal from a local broadcasting station—which would probably come in with loud speaker volume on a crystal detector—and reduces it to the same loud speaker volume, one gets an idea of what a big job it is.

This in itself is no simple problem, but the screen-grid tube, by permitting this use of a double volume control—one on the in-put of the set and the other on the amplification—gives greater control than has ever been obtained before.



HATHAWAY REPORTS PHILADELPHIA VISIT

Although the number of manufacturing establishments is small here, the Philadelphia area produces a large percentage of the radio receivers that are distributed in the country. The vast plants of Atwater Kent, Philco and Victor are included among the leaders in the industry, and in view of the business situation following the recent stock slump, it seemed logical to determine the status of these producers.

There has been some effect upon the radio market, as well as others, but all the radio manufacturers in Philadelphia state that while they have noticed an effect, they are not at the point where a shutdown of their manufacturing plants is imminent.

The Atwater Kent factory has curtailed its force and lowered the production schedule, but is continuing activities with as much vigor as when it was at peak production.

A cutting of production has been made in the Philco plant also, but they, too, state that the effect has not been as great as one would be led to believe. The plant is now operating at normal capacity.

Philco is stressing the new receiver introduced recently, known as the model 95, a shielded-grid receiver incorporating an automatic volume control.

Across the river in Camdem the Victor Talking Machine company, which forms a section of the Radio-Victor Corporation of America, is producing a comparatively large number of radio receivers. Officials are not making any complaints concerning the present situation.

Plans for the future are being carefully considered and it is the feeling of the Philadelphia producers that there will be no recurrence of the events of the last few weeks. There seems a likelihood that the manufacturers will not do a great deal of changing in the design of their receiving units, so that, contrary to last winter's procedure, the coming of the new year will not bring with it the large number of new models which has been thought likely.



DEFOREST TRANSMITTING TUBES

In addition to the complete line of audions for every broadcast reception purpose, the DeForest Radio Company of Jersey City, N. J., now announces a comprehensive line of transmitting audions as follows:

Type 510	15-watt Oscillator	Price \$	9.00
503A	50-watt Oscillator		40.00
511	50-watt Modulator		40.00
545	50-watt Amplifier		40.00
500	500-watt Oscillator		130.00
520B	5-kilowatt water-cooled tube		250.00

Other transmitting audions are being placed in production, such as higher-power oscillators and mercury rectifiers, as well as various sizes of screen-grid, general-purpose audions.

The DeForest transmitting audions are sold by the factory to consumer direct, and at the above net prices.

The Straight and Narrow Path



Yes, there is a terrible sermon to preach in radio. The radio sermon today, with socket power operation, is simply this:

Keep within the straight and narrow path—the 5% plus or minus limits set by tube manufacturers. Tubes are made to operate with specific filament, plate and grid-bias voltages. But electric light and power companies do not place much stock in such facts and allow their line voltage to vary from 85 to 135 volts.

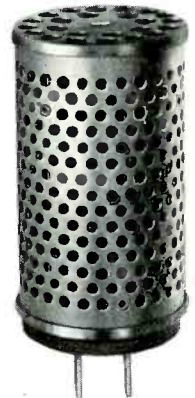
The results—excessive low or high voltage—is fatal to satisfactory radio demonstrations and a great hindrance to sales in the suburban and rural territories.

And so we urge you to keep within the straight and narrow path, within that 5% plus or minus voltage. Simple enough, if you make use of the

LINE BALLAST CLAROSTAT

the perfected, inexpensive method of regulating line voltage automatically, now employed in the better type socket-power radio sets. *It costs little, but saves much.*

Write for technical data. Better still, if you are a radio manufacturer or designing engineer, send us a sample power transformer, together with complete data and we shall gladly submit a matched ballast for your tests.



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STILES MANAGEMENT



AN ECONOMIC WASTE

Due to the rapidly changing preferences of a prosperous consuming public, it is not unusual for manufactured products—long considered staples—to become obsolete, figuratively speaking, over night.

Anticipating that, or in the hope of finding a product that will enable them to absorb excess administrative, productive or sales capacity, even the smallest of manufacturers, if they are alert, seek an opportunity to purchase new items on which patents have either been granted or are pending.

(Larger manufacturing institutions with few exceptions maintaining, as is generally known, special departments for the development of new devices and processes and to study offerings coming from outside sources.)

This was clearly indicated by a comparison of records following the merging of four manufacturers which recently brought to light the fact that each had considered the purchase of more than two hundred patents offered them by inventors and promoters within the previous eighteen months.

An analysis of the patents disclosed that, in forty-three per cent of the cases, two or more concerns had considered and comprehensively investigated the same patents.

With this evidence of duplication in time, effort and money, the history of a single device, submitted to one of them, was traced most carefully with the following result:

After lengthy and costly tests had proven the device practical, a weak patent situation resulted in its rejection. The expense entailed, according to the records, was \$1136.00, which did not include many hours of this Company's important executives' time.

Although the inventor was emphatic in his statements that this manufacturer was the first to whom his invention had been submitted, it was discovered that at least two concerns had considered its purchase during the preceding twelve months. Since then, three other manufacturers have been found who rejected it—in each case, for the same reason.

Exactly how many others have had a similar experience with this same patent will probably never be known, but the fact has been established that six manufacturers, in three different fields, have spent more than ten thousand dollars investigating it.

While the right of an inventor, or promoter, to peddle his patent is not questioned, in view of the increasing number of inventors and promoters offering them, a practical, positive means for the protection of industry generally is obviously needed to prevent the uneconomic duplication of effort and expense imposed on concerns contemplating patent purchases.

To check this waste, a group of representative business men have provided the funds to set up a clearing house—to be known as the United States Patent Institute—for the interchange of information on all patents submitted to associating manufacturers.

Such a clearing house was further deemed necessary because it was found that, failing to interest an established manufacturer in an unsound patent, the inventor, or promoter, with the aid of uninformed, misinformed or unscrupulous stock brokers, quite frequently solicited funds from the public with which to manufacture and exploit his patent.

The inevitable failure of such an enterprise then

throws, into an already overcrowded field, a completely equipped plant at the sheriff's price to compete with establishing manufacturers.

It is felt, a comprehensive means whereby the clearing house can collate and disseminate patent information can be evolved and it is intended that the records of the Institute be made available to Chambers of Commerce and Better Business Bureaus for the protection of those who seek information about investing in enterprises purporting to manufacture patented products.



NEW CECO 227 TUBE

The engineering department of the CeCo Manufacturing Company, has just announced the CeCo 227 to replace the N27—a high vacuum detector-amplifier tube.

Its features include:

Two mica spacing members, the upper one much larger than usual.

A grid built around two supporting bars instead of the usual single bar.

Short cathode.

Shortened distance from glass stem to electrode.

Longer glass stem.

The larger upper mica separator holds both cathode and grid in positions concentric to the plate and yet permits expansion when the tube heats, without strain to cause warping. Fastened loosely at one end, its inertia has the effect of damping vibrations of the electrodes. This prevents any prolonged howl in a receiving set. Also, it limits the distance through which the support wires can bend in case the tube receives a severe shock. The two pieces of mica work together to hold electrical characteristics to a higher degree of uniformity than any previously attained.

The doubly supported grid also helps to maintain tube uniformity. The supports prevent movement of the grid in any direction. Special treatment of the grid stops electron emission, thus correcting a common cause of tone distortion.

Other improvements noted insure increased resistance to shock, longer life through cooler operation and prevention of oscillation in the average receiver.

CeCo engineers state that the tube is not offered as one of the quick heater variety. In this connection it was said:

“Actually the cathode reaches its operating temperature in less time than did the cathode of the N27. CeCo will release a quick heating tube when and only when a way is found to combine quick heating with satisfactory operating life.”

The engineering bulletin describing the new tube further states:

“The CeCo 227 tube operates with 2.5 volts applied to the heater. The cathode sleeve should have a negative bias from 7.5 to 9 volts with respect to the heater. When used as an amplifier the grid bias should be 13.5 volts negative to the cathode and the plate voltage, 180 volts positive.

“In the detector position the tube will operate with the usual condenser and leak. Also, it will be satisfactory as a grid bias or power detector with 200 volts on the plate and 16 volts negative on the grid.”



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RECEIVER PRODUCTION TESTING OUTLINED

At the November 13th meeting of the Radio Club of America, held in Schermerhorn Hall, Columbia University, N. E. Wunderlich, Chief Engineer Production Design and W. R. Dohan, both of the Audio Vision Appliance Company, delivered a paper on sensitivity measurements and performance tests on Victor radio receivers. After outlining briefly the requirements and various methods of production testing for the three principal performance characteristics of a receiver, namely, fidelity, selectivity, and sensitivity, Mr. Wunderlich described a new signal generator and transmission line, together with radio-frequency attenuators, which make it possible closely to approximate laboratory tests in actual production.

The generator used for the alignment and sensitivity operation was particularly interesting. This generator is built in six separate sections, five of which are detachable units built in drawer form with plug-in connections at the rear. Each of these five units incorporates a UX-210 crystal oscillator feeding a UV-203A amplifier. The amplifiers are fed with modulated plate voltage supplied by the sixth unit.

The crystal oscillator has two crystal holders in a constant temperature compartment, with a switch to connect either in the circuit, thus insuring continuous operation. The output of the unit may be controlled by slightly detuning the crystal oscillator plate circuit or the amplifier plate circuit. The current flowing in these circuits, as well as the plate current of each tube, is indicated by meters on each unit panel.

The bank of modulator tubes is located in the power supply section. Four UV-203A tubes function to modulate the five R.F. amplifiers, and by proper adjustment, the percentage of modulation is maintained approximately equal for all frequencies. The entire generator is enclosed in a double-wall, copper-screen booth 8 feet square. The booth is provided with the usual "ice chest" doors used on measurement booths, and is practically leak-proof. A ventilating fan outside of the booth draws out the heated air.

The transmission lines are perhaps the most unusual part of the system. Sixth attenuators are used, each of 90 ohms impedance. Since a balanced to ground system is employed, this corresponds to 30 loads of 180 ohms each. The main problem of supplying main feeders and branch feeders with leakage low enough not to effect testing operations, was vanquished by using one-half inch lines with varnished cambric tape insulation, inside three-quarters inch round copper pipe.

The attenuators are connected across the line, in pairs, with the junction box grounded. Five shielded leads for five separate frequencies are brought from each junction box to a connection box at the rear of each attenuator. The attenuator unit consists of an aluminum casting box divided into nine compartments, five of which contain the sections of the attenuator for the five test frequencies. The multiplier is located in another compartment and a dummy antenna in still another. Leakage is small.

At present 20 positions are in service and the system is operating very satisfactorily. Noteworthy features are frequency stability and less checks on test positions.

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THE FORECAST FOR 1930 A STATEMENT

By POWEL CROSLY, JR.
 President Crosley Radio Corporation

In the radio industry for 1930, the most important thing will be time to assimilate the new and wonderful screen-grid tube and take full advantage of its enormous capabilities. Tremendous strides already have been made in utilizing this tube, and present screen-grid sets are a revelation. In 1930 we will see further refinements in mechanical construction and electrical design, giving still more amazing results.

With this there goes the necessity for further improvements in loud speakers to take full advantage of the marvelous quality which can now be built into these sets. The industry needs, and will need in 1930, a much greater knowledge of what a radio set should be, on the part of the distributors, the dealers and the public; and an increased ability to discriminate between overdrawn advertising claims and real merit in the product.

In my opinion, the outstanding developments in radio during the coming season will be as follows:

1. *Bigger and better broadcast programs.*
2. *Still greater improvement in the performance of receivers through continued development of the screen grid tube.*
3. *Further improvements in loud speaker reproduction to take full advantage of the tremendous quality capabilities of the screen grid tube and the new power output tube.*
4. *Much greater uniformity of performance in radio receivers; the same ability to receive at great distance and to separate one station from another over the entire broadcasting band.*
5. *Frequency calibrations on the receivers so that listeners can immediately identify any station they hear.*
6. *Greatly improved method of volume control, giving a far greater range of control than previous sets.*

Radio is sweeping onward toward the greatest season in its history. My own faith in the future of the industry was reflected by the addition of two new factory units to our Cincinnati plant. We are doubling our force of

EFFICIENCY PLUS

Lester Abelson, whose duties are those of general production manager of the Steinite Radio Company in Ft. Wayne, is developing a number of unique methods for checking and improving efficiency in his company's new plant.

He has recently had installed on his desk, for instance, an automatic counter on the order of a taxicab meter which clicks off the number of each completed radio set as it leaves the factory to be placed on a car for shipment.

As a further aid in checking efficiency, Mr. Abelson himself takes moving pictures with his own camera of various operations throughout the factory. By reviewing the films at his home in the evening, he is able to detect points where production can be speeded up and changes made.



WE SALUTE YOU, MR. WITTEN!

Louis A. Witten, in charge of radio broadcasting of the Kolster Radio corporation, recently made this announcement over the air: "There are many good sets on the market—Kolster is one of them. We believe it is the best. But whether you buy a Kolster or not, you owe it to yourself to get a modern radio and thus take the fullest advantage of the extraordinary entertainment and educational features now being broadcast."

Mr. Witten's business philosophy is based on the hypothesis that any concern in the industry is benefited by the growth of the whole industry—a view that is economically sound. He also estimated that 45 per cent of the sets now in use are three or more years old.

employees and there is every indication that buyers' demands will result in a similar increase in production.

To some of us pioneers in the industry, the miracle of radio is an ever-recurring one. As I recall the time when a daily output of ten receiving sets was "a great day's work"; and as I reflect that more than 350,000 persons are employed in radio today, not to mention the millions for whom it has furnished entertainment, education and culture, I hesitate to outline the future of this amazing industry which emerged from its swaddling clothes only a few short years ago.

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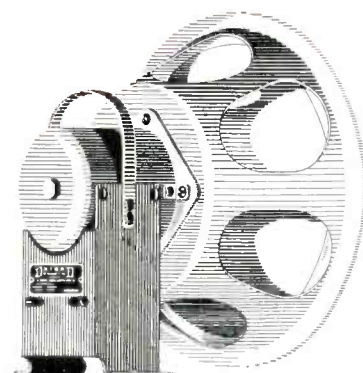
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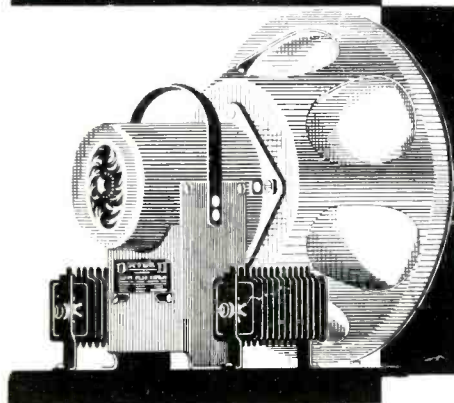


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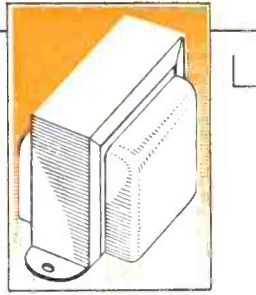
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