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Radio Sales and Service

The National Magazine for Dealers and Servicemen

$2.00 per year

December 15, 1930
Circulation 48,000

What are 1931 Tubes?

IT'S easy to identify 1931 tubes among the general run of tubes. Meters and performance rather than labels and claims soon separate the sheep from the goats. And to save your time and trouble, here are some 1931 tube specifications:

Positive Characteristics—doubling diameter of support wires, better bracing, tightened tolerances.

Improved Tone Quality — greater rigidity for minimum microphonic effects and suppression of distortion due to undesirable regeneration.

Quiet Background—DeForest research into causes of hum and crackle resulted in reducing noise level to one-fiftieth former standard. Also lower gas content due to special DeForest exhaust units.

Long Service Life—improved filaments, cathode insulators and emitters insure full thousand hours of peak efficiency.

Greater Volume — increased mutual conductance in power tubes, yet fully interchangeable with usual tubes.

Quick Heating — average 10 seconds, yet without sacrificing life, reliability, quiet operation, because of patented DeForest notched cathode insulator.

Higher R.F. Amplification — 60 instead of 30 per stage with screen-grid tubes, together with maximum stability.

The foregoing 1931 radio tube features are not to be found in tubes produced six months ago, much less those a year or two old, taken from large inventories. DeForest research and engineering, rapidly translated into everyday merchandising terms by a production geared to demand, brings these features to you and your trade in fresh DeForest tubes.

DEFOREST RADIO CO.

De Forest RADIO TUBES

PASSAIC NEW JERSEY

AGAIN "SUPREME"

this time in ★ ★ ★ SUPER HETERODYNE SERVICING

AGAIN the leadership of the Supreme Diagnometer, long recognized throughout the radio world as the most complete testing instrument—often imitated but never duplicated—is demonstrated. Its sponsors now announce a Special Calibrated Coil for the peaking of Superheterodyne Intermediates at 130 K.C., 175 K.C. and 180 K.C.—also for "flat topping" certain stages as prescribed by some manufacturers. Available at nominal cost—you need it to keep pace with modern radio progress. Write, right now, without obligation!

●

Another "SUPREME" forward step is Oscillator Model 70—an efficient R. F. Modulated Oscillator, shielded and contained in an aluminum case. This Oscillator not only provides means for peaking and "flat topping" all Intermediates, but covers the broadcast band; any desired frequency being available thru means of a variable condenser. Operates from either A.C. or D.C. line or from batteries. Available at an amazingly attractive price. Be up-to-date—get the facts—without obligation.

SUPREME RADIO DIAGNOMETER
Model 400-B

The only complete portable radio laboratory.

The master craftsman's tool in radio servicing—the testing equipment which clearly establishes its owner as a radio servicing authority—leader in his profession. For Shop or Portable Service.

SUPREME SELF-SATISFYING SELF-PAYMENT PLAN

To put the best in servicing equipment within the reach of everyone—the Supreme Self-Satisfying Self-Payment Plan gives you Supreme Instruments on a strictly "make-good" basis. Includes also a merchandising system certain to create new business. Write, without obligation, for the complete story appropriately entitled, "Everything to Gain and Nothing to Lose."

For "Supreme Service" results insist on Supreme Testing Instruments, which also include:

Supreme Set Analyzer Model 90
Supreme Tube Checker Model 19
Supreme Preheater Model 30
Supreme Ohmmeter Model 10
Supreme Laboratory Test Panel

SUPREME INSTRUMENTS CORP., 394 Supreme Bldg., Greenwood, Miss.

Distributors in all Principal Cities

SUPREME
Testing Instruments
"SUPREME BY COMPARISON"

Service Depots in New York, Philadelphia, Pittsburgh, Chicago, Kansas City, Seattle, Toronto, San Francisco

Export Division: 130 West 42nd Street, New York City

Cable Address: LOPREH, New York

To answer an advertisement, tear out page and pin to letterhead

What's NEW in Radio?

HOW would you like to be posted on the new things and new developments in radio, just as soon as they come out? How would you like to receive mail from the country's leading radio manufacturers, wholesale radio mail order houses and publishers in the radio industry? How would you like to have access to the most complete radio data files ever compiled, containing all the important facts in every phase of radio progress? How would you like to receive regularly, catalogs, folders, circulars, price lists, bulletins, samples galore, etc., keeping you in close touch with the happenings in the radio industry for an entire year? This is only part of our complete service to you.

Would you like to locate a manufacturer of a certain product? Would you like to know the name of a jobber near you handling some particular item you may be interested in? Let us solve these questions for you.

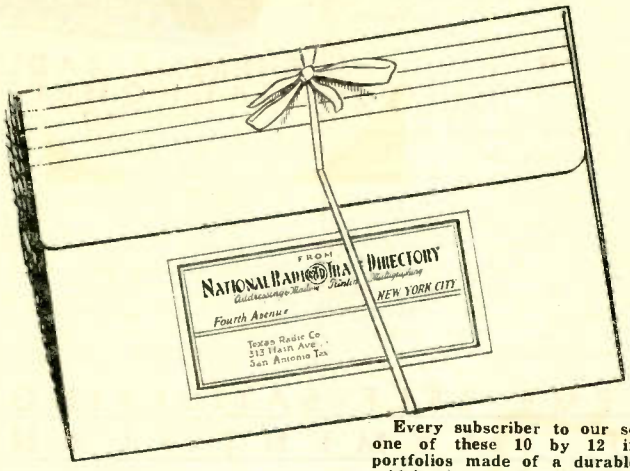
No live radio dealer, fan, amateur, experimenter or professional can afford to be without our comprehensive service.

Our business is the nerve center of the radio industry, reaching out everywhere, collecting data from every available source, maintaining the most complete service of its kind in the world.

You will realize that the amount we spend for postage alone does not cover the charge for our service. The $1 subscription fee barely pays the necessary expenses entailed in mailing.

A subscription to our service will actually save you many times the small cost of $1.00.

If there is any additional information you may require before subscribing, write for further details.



all for $1

Every subscriber to our service receives one of these 10 by 12 inch accordion portfolios made of a durable material, in which to save the valuable data we send you.

Just Pin DOLLAR BILL to this form, fill in and Mail at once!

Date.....

NATIONAL RADIO TRADE DIRECTORY,
303 Fourth Avenue, New York,
Department R.

Gentlemen:

Enclosed please find $1.00 for one year's subscription to your "Big Mail" and "Radio" Information Service. It is understood that you are to put my name on your stencil list to receive mailings, including catalogs, bulletins, price lists, samples, etc. I am also to receive free a 10 by 12 inch accordion portfolio.

NAME.....

ADDRESS.....

CITY..... STATE.....

To answer an advertisement, tear out page and pin to letterhead

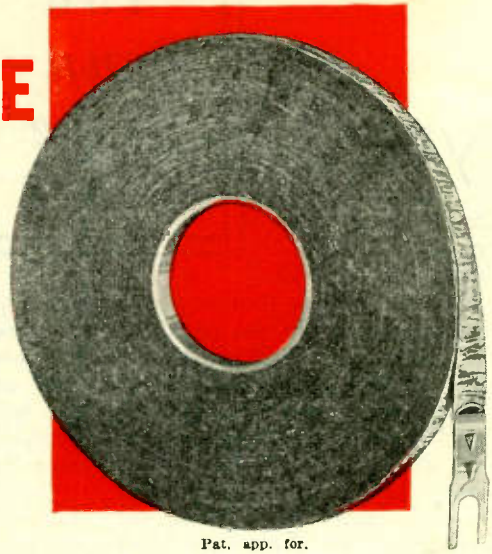
A Marvelous Invention

Ends Radio Installation Griefs

STIKTAPE AERIAL

STIKTAPE AERIAL—a descriptive name for a distinctive product. "STIK"—it sticks to anything, anywhere, because it is backed up by a powerful adhesive "TAPE" which is covered with a metallic alloy resulting in an "AERIAL"—genuine—not a substitute—not an eliminator.

Don't class STIKTAPE with "trick" aerials or aerial substitutes. It is highly efficient and withstands the most critical scientific inspection. Endorsed by many leading set manufacturers.



Pat. app. for.

Now you can forget the worries and expense of aerial installation. You can install STIKTAPE AERIAL in a few minutes. No troublesome dangling wires, nails, or knobs. Hammers, drills, and chisels are not needed.

STIKTAPE is a real aerial that you can stick along a baseboard, over a picture moulding, or under a rug. It is easy to put up and easy to move. List price $1.00 per roll—your price $7.20 per dozen. Order STIKTAPE AERIALS from your jobber. Save money and time with assured satisfaction.

Mail the coupon

Mail the Coupon for Important Data

Sampson Industries, Inc.,
4225 Olive Street, St. Louis, Mo.

Send me the data that proves STIKTAPE is a real aerial of proven merit—not a makeshift or a substitute.

Name .....

Address .....

To answer an advertisement, tear out page and pin to letterhead

Are You *Penny Wise* ?

YOU have often heard it said, "Don't be penny wise and pound foolish." And yet it is so natural. Another tendency is to procrastinate. Do you recall the fellow who explained why he did not repair his leaky roof? He said, "I can't mend it when it is raining and when it stops raining, the roof doesn't leak." How many business roofs are leaking now because they were not mended while skies were clear and business was good?

Among "penny wise" people are some Radio Wholesalers. When times are good they are too busy to find out what a good investment membership in the Radio Wholesalers Association would be. They take an indifferent attitude. When there is a business depression they practice a "penny wise" policy by saying they cannot afford the price of membership.

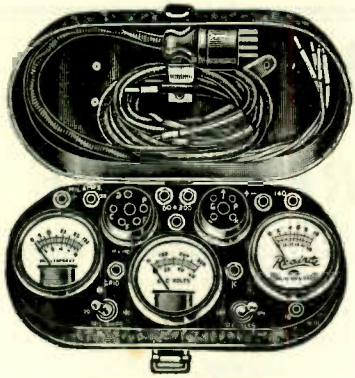
The Radio Wholesalers Association was organized and functions for the benefit of the entire radio industry, from manufacturer to consumer. It safeguards the best interests of the Radio Wholesaler and Dealer. Its membership represents a majority of the purchasing power of the country from Radio Manufacturers.

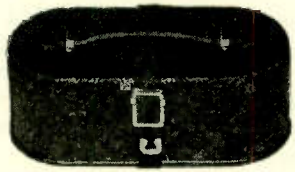
The Annual Convention of the Radio Wholesalers Association will be held in Indianapolis on February 16-17, 1931, and will be a "down to facts and remedies" convention. Rub elbows with the fellows who will **not** be "licked".

Join the Radio Wholesalers Association, Mr. Radio Distributor—don't be "penny wise", especially in these times. Don't indulge in "false economy". Write for information regarding membership and plan now to attend the convention in Indianapolis.

Radio Wholesalers Association

EXECUTIVE OFFICES
32 West Randolph Street
CHICAGO, ILL.





No. 245-A Closed

No. 245-A For Servicing Sets, $20.00

No. 400 For Counter Tube Testing $20.00

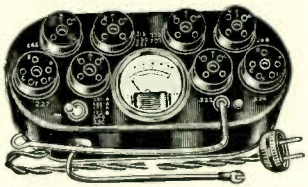
$12 NET

Order one or more today. If not at your jobbers we will ship direct.

NEW READRITE SET AND TUBE TESTER No. 245-A

Newly designed to meet the servicing needs of all types of radio receiving sets. Used by experts. Adaptable for every kind of socket test. Also continuity of circuits, a.c. and d.c. and all tubes, including screen-grid, pentode and rectifier. Checks line voltage. Furnished with charts, curve values and full instructions. Accurate. Compact. Simple to use. Seamless steel case finished in beautiful baked enamel.

Readrite



NEW READRITE COUNTER TUBE TESTER No. 400

A new tester that gives dealer and customer the required tube value information. Definite grid change shift provided for mutual conductance test. Eight sockets for testing all tubes, including the new 2 volt tubes. Connects to a.c. supply. Simple to use. Accurate. Dependable.

Handsome finished baked enamel steel case. All parts completely shielded. For use wherever tubes are bought, sold or used. Complete with tube chart. Be sure to order yours today.

Catalog covering our line of many Servicing Instruments for a.c. and d.c. will be sent upon request.

READRITE METER WORKS

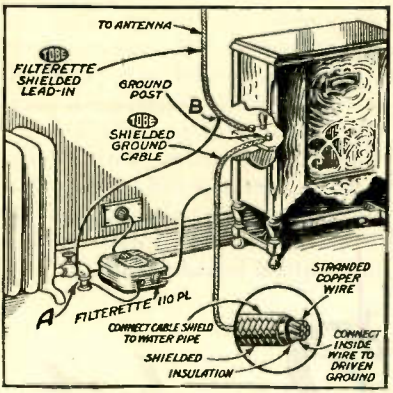
Established 1904

20 COLLEGE AVE. BLUFFTON, OHIO

To answer an advertisement, tear out page and pin to letterhead

TOBE Filterette

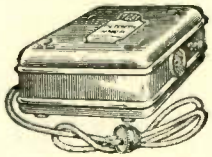
STOPS INTERFERENCE



We do not believe in exaggerated claims or statements—pretty sounding adjectives—this magazine has no place for them anyway.

This system, as illustrated by a plain electrotype at the left, is effective and fundamental; we would not permit our trade mark to appear on it if it was anything but GOOD.

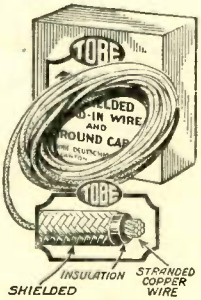
WE know that the ideal solution to the ever increasing radio interference problem is to locate and FILTERIZE each and every piece of apparatus which is creating interference with a FILTERETTE. The use of our No. 110-PL Filterette and Filterette Shielded Lead-in will be a valuable help to the individual dealer besides being a profitable item to sell.



Filterette No. 110-PL Line Filter
Price $12.50

A 20-page booklet, "A New And Approved Method For Preventing Radio Interference From Entering the Radio Receiver," is packed with each No. 110-PL Filterette.

You will want to try this system at once and we are prepared to ship PREPAID one No. 110-PL Filterette and one carton of 50 ft. Tobe Filterette Shielded Lead-in Wire upon receipt of your check or money order for $9.00 provided you mention the name of your jobber when remitting.



No. 25014,
250 Ft. No. 14
$11.00

No. 5014,
50 Ft. No. 14
$2.25

The Acknowledged Authority on Radio Interference—Makers of FILTERETTES, the Accepted Remedy.

TOBE DEUTSCHMANN
CORPORATION
FILTERETTE DIVISION
CANTON, - - - - - - - MASS.

Radio Sales and Service

The National Magazine for Dealers and Servicemen

Contents—December 15, 1930

Features

Merchandising

Servicing

Published Monthly at 549 W. Washington St., Chicago

R. D. Allbright, General Manager — John S. Meck, Technical Editor
L. C. Tobin, Eastern Representative — 11 West 42nd St., New York.
G. K. Thompson, New England Representative 25 Huntington Ave., Boston, Mass.

Be Careful

Consider these vital facts before buying an oscillator

SERVICEMEN are clamoring for portable test oscillators. They need them for checking T.R.F. receivers and super-heterodyne intermediate stages.

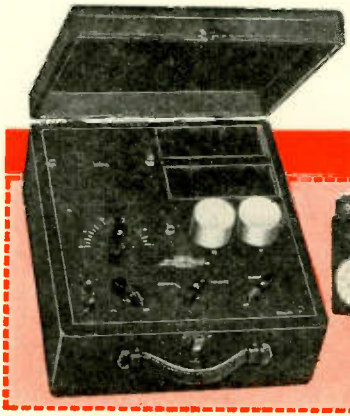
There is a big temptation to buy at the lowest price—but look out! An oscillator, of all radio instruments, must be right—or else it's all wrong.

An oscillator is a radio transmitter for producing signal frequencies under your control. Every bit of signal output must be fed from the oscillator to the set through a shielded cable. Never must the slightest trace of signal be broadcast through the air to the set.

The tiniest flaw in the shielding—the slightest radiation from an exposed conductor converts the oscillator into a broadcasting station—and then it is practically worthless.

Select an oscillator like an engineer—not like a bargain hunter. First acquaint yourself with the fundamental requirements of a good oscillator—then buy the instrument that meets these essential specifications.

There is a liberal education in oscillator design and operation in the new Jewell bulletin describing every detail of the Pattern 560 Oscillator. Every up-to-the-minute serviceman should read this timely discussion of oscillators, just off the press. It contains a wealth of information on the most important service problem confronting radio servicemen today. Don't buy an oscillator until you know what a reliable and satisfactory oscillator is and how it must be built. Mail the coupon!



Pattern 560 Oscillator with Outputmeter (tubes and batteries included).

List Price $97.00

Dealers' Price 72.75

Mail the Coupon

Jewell Electrical Instrument Co., 1642-P Walnut St., Chicago, Ill.

Send, immediately, bulletin on Pattern 560 Oscillator. Also send details of Jewell Easy Payment Plan.

Name .....

Address ..... **State** .....

To answer an advertisement, tear out page and pin to letterhead

Radio Sales and Service

The National Pocket Magazine for Dealers and Servicemen

Chicago, December, 1930

Just Pigs!

FEAST or famine—undersold or oversold—the radio market for the past eight years has been the scene of the most hectic merchandising the world has ever known. Changing overnight from a hungry, starved market to one completely overstuffed—radio has held more headaches per dollar net profit than would seem possible with a new industry of such rapid growth and universal popularity.

Why? Pigs are the answer: Manufacturers who tried to hog the whole market—jobbers overanxious to get more than their share—dealers who cast scruples to the winds in order to sell every prospect in sight!

The trade has fought long and hard for ample profit margins only to squander profits on trade-ins which, to everybody concerned, were obviously masqueraded price cutting.

And now the midget, which should rejuvenate a jaded market, is being devastated in the same ruthless and profitless fashion!

It would be well for dealers to get together—develop studies in sales costs, formulate data on trade-in allowances, and work in harmony for the good of the trade. The Radio Trade Association is an ideal vehicle for traveling to this destination!

Why Merchandise Tubes?

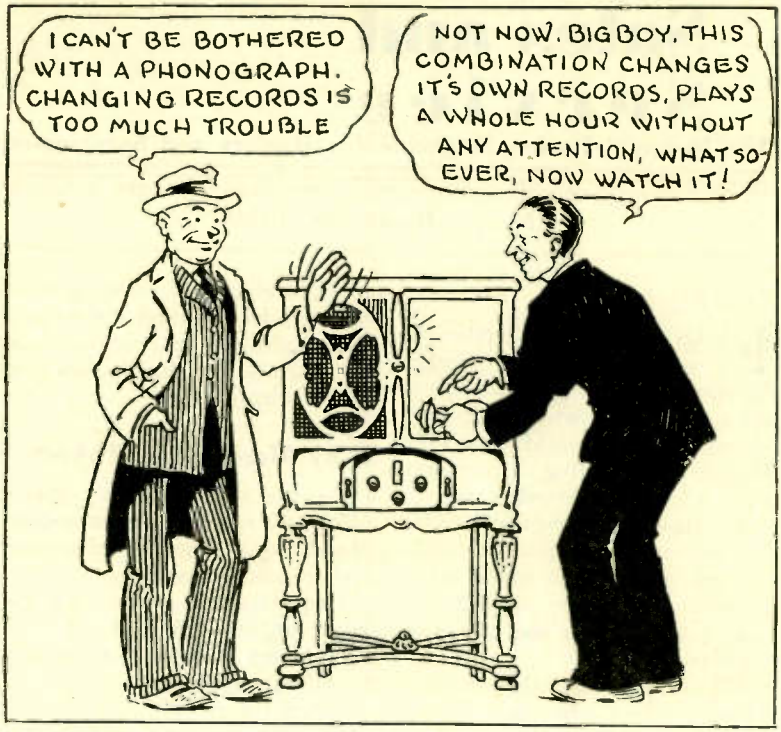
As the radio industry grows older and more stable, tube merchandising will become of greater and greater importance.

Unquestionably tubes are the heart of the radio set. Poorly functioning tubes mean equally unsatisfactory reception.

Strangely enough a set owner may become accustomed to the distorted reproduction caused by tubes that deteriorate gradually, but how about his neighbors? And it is the neighbors who buy sets. A good set in service delivering programs with perfect tone quality is an advertisement that sells sets; but one receiver that distorts—that performs poorly—can undo the work of ten good sets and a tremendous advertising program.

By merchandising tubes—checking them regularly — replacing weak or poorly functioning tubes —you can keep every set you sell operating up to par.

Hear Your Favorite Music When You Wish



IT is no longer necessary to jump up at frequent intervals and change records in playing a phonograph. The new automatic record changers eliminate that inconvenience.

With these ingenious devices you can enjoy thirty minutes of good music without leaving your chair. A radio phonograph combination with an automatic record changer enables you to hear your favorite music when and where you want to—just as conveniently as you can listen to a radio program. If you haven't a radio phonograph with an automatic record changer you have a new treat in store.

RADIO DEALERS—An enlargement, size 11x17 inches, will be mailed to you upon request, accompanied by five two-cent stamps and a letterhead or invoice bearing your name. This enlargement displayed in your store will increase your radio-phonograph sales. Mail requests to RADIO SALES AND SERVICE, 549 W. Washington St., Chicago, Ill.

A January Radio Window Display

By GEO. J. COWAN

THIS window suggests to the passerby that he make a New Year's resolution to "Buy a Radio." To do this we suggest you cut out of wall-board a scroll-shaped panel on which you paint the wording, "Make this New Year's Resolution—Buy a Radio." On the lower left-hand corner you paste a large gold seal or wafer. This covers bright red ribbons that radiate to the radios you display in the window.

A long, narrow sign on the floor of the window reads, "New 1931 Models." This sign is made in this shape so it will not obstruct the view of the center radio.

Platforms are built in the corners of the window to display the radios and break up the monotony of a one-level floor.

This window idea can be placed against any permanent background you may have in your window. If your window is open, all you need

do is build a temporary back of wall-board. This wall-board can be painted in aluminum paint, while the resolution can be in white and the diamond shaped pieces in a light red. Cover the platforms with red paint, paper, or cloth. This red will balance with the red in the border.

To give a decorative finish to the top of your window use a border made up of diamond-shaped pieces of wall-board, in various sizes. On two of these are painted silhouette designs of hour glasses typifying the passing of time. On the other pieces paint the numerals "1931."

There's Money in Tubes

By
H. BAUKAT

"CERTAINLY there is money in tubes," said Jack Hurd in answer to my question, "but you have got to know how to merchandise them.

"For a long time I, like many other dealers, simply considered tubes as a necessity that went with every radio set. I did not fully appreciate the profit that can be had from their proper merchandising.

"The majority of dealers have been depending entirely upon their servicemen for tube sales. This was all right as far as it went—but it did not take complete advantage of the tube renewal market.

"When you stop to consider that, according to reliable figures, there are over eleven million radio sets in use in the United States today, of which only about seven million are of modern design, it is easy to see not only the large market for new sets but the larger market for tube renewals.

"Not only are these sets, which have been in use for a year or two, excellent prospects for new tubes, but every set sold this year will be on the prospect list next year. However, I soon found out that in order to capitalize on this knowledge of the tube renewal market and get my full share of it, I had to do something to make people tube conscious.

Tubes Are Pickup Merchandise

"Now it is more and more evident that tubes are pickup merchandise. They are something

»» »« »»

People to Buy Them

But You Must Remind

»» »» »»

Hurd's Store, Attractive Inside and Out, Draws Customers

that every set owner needs at some time or other. But the unfortunate part of it is that people don't think of tubes until they burn out one. Therefore I found that it was good merchandising to keep tubes displayed prominently in both my store and my windows. As soon as I started to remind people in this way they should buy tubes, after their sets had been in use a year, to keep their sets in perfect operating condition, my tube sales started going up. And, they are still going up.

Stock Arrangement Most Important

"One of the most important things to remember in merchandising tubes over the counter is the arrangement of the stock. A neat, orderly display is more apt to stop people than a haphazard sort. I find that keeping tubes on the counter makes customers stop and inspect them. This gives me an opportunity to inquire when they last had their tubes tested or when they last bought renewals. Among other things I handle, besides radio, are electric lights. Never do I let a customer who makes a purchase of lamps go without asking about his radio tubes. With just such simple sales effort as this it is surprising how many people will buy tube renewals.

Counter Displays Help

"I remember one instance not long ago when two women came into the store to look at some electric clocks. One suddenly saw a display of tubes on the counter.

" 'Oh,' she cried, with the usual human enthusiasm of having discovered something with which she was acquainted, 'there's the make of tube we use in our radio.'

"I at once knew that something had made her think of her radio besides the mere display of the tubes and, upon inquiry, found that her set was two years old and

not sounding as well as it did. I explained the necessity of renewing the tubes once a year if the set was used very much and offered to have a serviceman come around to check up all the tubes. This was agreed to and the result was that a complete renewal of tubes was sold to this woman the next day."

Good Serviceman Great Asset

Not only that, but by sending to this customer's home a serviceman who had an eye for sales, leads were obtained from this now grateful customer. These led to the sale of two console sets and several other complete tube renewals. The serviceman gets a 5 per cent commission for all sales made in this way.

"This brings me to the part servicemen play in building up a successful business. They can sell much merchandise, both directly and indirectly, if they are the proper type of men. By this I mean a serviceman who not only knows the technical part of radio, but also takes advantage of his opportunities while with the customer to inquire about the sets of the neighbors and find out who does not own a set in the locality. On a checkup I find that approximately 80 per cent of my business can be traced to the work of my service department. Therefore I cannot stress its importance too much. You also want to remember that the serviceman is the only representative of the store most customers ever see after they buy their radio set. Therefore it is highly important

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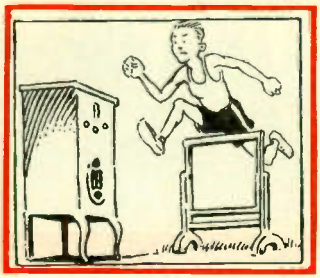
Keep the Credit Hurdles High

By J. L. SIMPSON



KEEP the credit hurdles high enough and you won't have any credit troubles. Every good bank is run on this principle. So is Paul's Music Store, Kansas City, Mo., one of the safest and most enterprising retail radio establishments in the southwest. This store turns down more radio business than it accepts. Hence the volume it does is profitable volume. No sound banker starts out in the morning to see how many loans he can make before night; his chief concern is with the soundness of his loans. Pretty much the same practice goes on in the Paul store; sales have to be sound before they achieve the dignity of sales.

Easy to Sell Poor Credit Risks

Every radio dealer knows the credit hazard, but not every dealer guards himself in true preparedness fashion against it. Usually the worse credit-risk a man is, the easier it is to sell him a set—providing the down payment is small enough. Then, after the "new" has worn off, the set bounces back. Now the happy dealer has another second-hand radio to sell. That sort of happiness (?) doesn't appeal to the Paul management. Consequently, no second-hand sets are for sale in the Paul store.

Customers from Every Walk of Life

It is no small honor for a customer to be admitted into the ranks of the other Paul customers —they are a choice lot. His rating is checked. His general reputation is investigated. He is likely to be the owner of his home, his business, or anchored with some security to his job. Each investigation must show that he is not only able to make money, but "Scotch" enough to save it. In this sifting out process, character counts heavily. Some of the Paul customers work for wages and live in apartments. Often they turn out to be better risks than those of greater pretensions. No walk of life has a monopoly on honesty.

A rebuilt theatre makes an unusual showroom.

No More Home

As told by

C. W. Ristow

NO more home demonstrations! Since Jan. 1, 1930, that has been the firm policy of the Ristow Radio Corporation, 3622 Irving Park Boulevard, Chicago. Result! A ten per cent saving on sales expense, not to mention the removal of much grief which used to vex this retail organization headed by Chester W. Ristow. Who can blame him for hoping that every other dealer in the land may adopt the same policy?

In 1928 Mr. Ristow and his staff did a retail radio volume of $200,000. Subsequently, of course, the business has not fared so well, yet they are still selling radio with the same old vim and in impressive volume. Mr. Ristow is a director of the Midwest Radio Trades Association. Its increasingly effective efforts to better methods and ethics in the retail radio field have made him a strong believer in such association work.

Customers Don't "Shop Around"

After a set has been left in the home "on trial" it gives the customer time to shop around to see if he can't find a better or a cheaper one. And, following some mysterious law of psychology, he usually does that very thing. Such conclusions come right out of the Ristow book of experience.

One of two things then happen: either the dealer has to take the set back without any sale, or he has to lug two or three more sets into that home in order that the "on trial" period may be lengthened and profits correspondingly shortened. But by setting up his new policy and sticking to it,

The old lobby lends itself to the display of allied lines.

Demonstrations

Mr. Ristow has eliminated all such selling "interference."

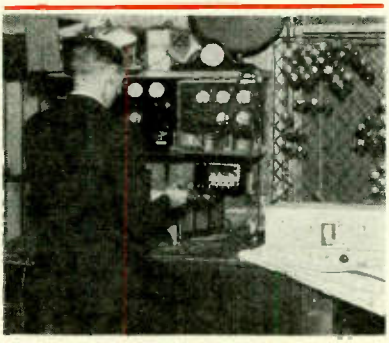
Was this hard to do? "On the contrary," declared Mr. Ristow, "it was surprisingly easy. So far as I know our no-home-demonstrations policy hasn't given us a single jolt, although it has absorbed a lot of shocks that we would have received without it."

Down Payment Before Set Leaves the Store

In-the-store sales are now the rule at the Ristow establishment. Each set is sold right on the floor with a down payment then and there, plus a definite understanding that if after three days the customer is dissatisfied with his purchase, he can come back and get a better one more to his liking. But he can't return the set on any or no excuse and go somewhere else to buy. That's not in the contract. He has "bought something" from the Ristow Radio Corporation and the settlement agreed upon before he left the store says so.

Often a customer comes in and declares he can't afford much of a radio set and buys one which he thinks he can afford. After delivery he gets to listening and thinking and perhaps comparing. That set, quite good enough for the money, educates him on tone quality. Before his three days are up he returns and confesses that he guesses

(Cont. page 61)



Ample Service Equipment

Service Here

How Ray M. York of the O. R. Martin

If Servicemen Were Not So "Penny Wise and Pound Foolish," Many More Tubes Would be Sold to the Benefit of the Customer and All Concerned. Still Mr. York's Firm Does a Tidy Tube Business.

By G. F. MASSEY

CASH for every service call! That's the inflexible rule with the O. R. Martin Co., 3158 North Clark Street, Chicago. Whether it's merely a tube replaced or a complete job of overhauling, full payment in United States money passes from the customer to the Martin serviceman before he leaves. No collector has to get on the trail and kill the profit. The rule protects that.

With a good many retail radio organizations trouble-shooting is not so simple and pleasant. The trouble is that the trouble doesn't stay shot. It rises later in the form of collection grief to bedevil the dealer who takes no such precaution. Disputes develop. Complaints are lodged. Room for endless argument remains. Customers are estranged.

Well, Ray M. York, head of the Martin Company, doesn't like that sort of thing any better than the next dealer. One day he joined the Midwest Radio Trade Association and, in the course of time, attended a meeting at which the matter of cash-for-service came up. The policy is now sponsored

Means Cash

Co. Adopted the Rule and Made it Stick

and pushed at every opportunity by the association.

"But," says Mr. York emphatically, "if I hadn't been at that meeting, the chances are that we wouldn't be getting cash for a lot of our service and we would still be in the same old bad fix in that respect. As it is now with us, the payment of cash after each service call closes the deal. That's definite. There's not a ghost of a show for complications. Yes, it's a vast improvement over the old lack of system so far as service settlements are concerned.

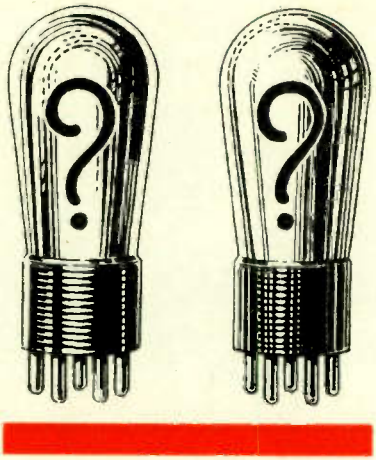
"If, after forty-five days or some such period, the set refuses to work properly, it means just another service call to be handled in exactly the same fashion. This is one policy that every radio dealer ought to adopt. It works for us and I see no reason why it shouldn't work for anybody else. By the same token, every dealer should belong to some good radio trade association. Genuine business fraternity and exchange of thought pay. The ideas gained through membership are worth far more than the time and dues involved."

Three lines of tubes are carried in the Martin stock. Replacement tube sales are classed with service; cash is the rule. But tubes are tested free; the firm makes an advertising point of it. The service department is the source of a good many radio sales; a good deal of material is also sold through the service contacts. Just the same, Mr. York is not altogether satisfied with his volume of tube business. It might be more, he thinks, were the service-

(Continued on page 59)

Check Those Tubes—

Laboratory Curves Show Poor Operation



By H. S. Dunning
Ken-Rad Corp.

Which One?
They look the same, but what a whale of a difference a few tests show.

THE serviceman constantly meets set owners who believe a tube is good as long as it lights up when the set is turned on. Faithful reproduction will depend upon the operating characteristics of the tubes in the set. Even more widely spread is the thought that if the set brings in a program faults in the reception cannot be caused by the tubes. Both of these impressions are incorrect. Tubes wear out. In most cases the change in tube characteristics takes place so slowly that the effect is not noticeable to the ear. Under average conditions tubes which have been in service six months or more have changed from their original values to a point where a decided improvement in reception will result from replacement with new tubes. This apparently is not appreciated by the average radio set user, and he thinks of tube replacements only when the set either refuses to operate or gives an extremely weak output.

Greater Electron Flow from New Tubes

Every hour a tube is operated, hundreds of thousands of electrons flow from the filament or cathode to the plate. A new tube is capable of producing an abundance of these electrons; an old tube can only produce them in smaller numbers and at a much more limited rate.

Visual examination, no matter how painstaking, cannot reveal the changes as they take place in a radio tube, due to service. These changes can only be detected with the aid of instruments of the

Looks Don't Count!

Begins Long Before Failure Is Reached

highest precision, operated by engineers trained in tube measurement.

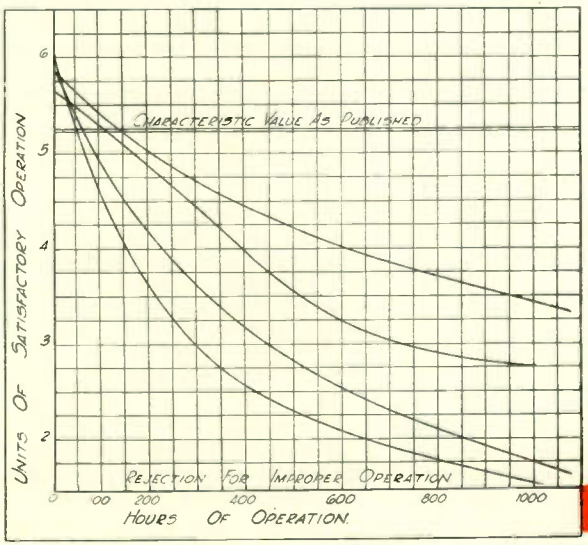
False Economy not to Replace All Tubes in a Chassis

Every reputable manufacturer of radio tubes is spending much time and money to make his product as uniform as possible. In spite of this effort, tubes of various makes or individual tubes of the same make do not have a uniform change of rate in their characteristics. It frequently occurs, therefore, that radio reception is much improved by the replacement of a single tube in the set. Unless, however, the remaining tubes were very recently installed, such single tube replacement will not produce the best results in reproduction, since, after such replacement, the set will contain one tube fully up to the initial standard in characteristics and a number of older tubes which have reached various degrees of inefficiency.

Life Deterioration Curves Interesting

The accompanying diagram shows curves produced from actual laboratory test data obtained under service conditions. These tubes indicate typical, individual

(Continued on page 63)



Curves visualize the change.

Sales Stimulants

Radio Sales and Service will pay $2.00 for each sales idea published. Send in story of successful schemes you have used.

Sales Ideas Other Dealers Have Used

Merchants who change their windows every week will be interested in this discovery made by a Southern retailer. For a long time, this dealer had been in the habit of creating new displays promptly on Monday morning. But after a bit, he found that customers who went window shopping over the weekend came around about Tuesday or Wednesday to buy. Not seeing the radio in the window, however, some of them assumed that it had already been sold, and therefore, didn't come in at all.

To obviate this, the merchant is now arranging his displays on Thursday mornings.

Copy that tells a convincing story on behalf of better radios.

"If you pay $50 for a radio that gives satisfaction for about two years, it will cost you around $25 a year.

"If you pay $75 for a radio that gives satisfaction for about four years, it will cost you around $19 a year.

"That is why so many of our customers tell us it is an economy, as well as a pleasure, to buy our radios."

A story has it that the George Muse Co., of Atlanta, Ga., once received an unsigned check in payment of some account or other. As there were no means of knowing whose check this was, the store despatched a letter to all of the old standing accounts, explaining the situation. Not only was the sender's name thus ascertained, but a good many of the accounts took it as an opportunity to pay up. Which teaches us that an adroit reminder can be embodied in a letter asking for information.

To hold in mind over a period of years all the displays that a merchant creates is obviously impossible. One retailer therefore keeps a written record. On this he notes the amount of business pulled in by each display, as well as the various factors attending it at the time it was exhibited, such as: 1. Method of arrangement; 2. Character of the merchandise shown; 3. Time of the year; 4. Special occasion. This radio retailer even goes to the extent of making sketches of the layouts used.

With this record to refer to, the retailer is thus able to avoid displays that have proved unprofitable, and what is more he is able to evolve new windows, not by guesswork, but with the methods shown by the record to have been successful in the past.

When a new salesman is added to the staff of a Denver radio store, he is required to furnish the names and addresses of his friends. An engraved card announcing the fact that he has joined the store staff is then sent to each name. Many new customers are naturally brought in by this means.

A store in Rochester, N. Y., plays up its featured radio under the title of "Radio of the Month," thereby capitalizing on popular interest in the "Book of the Month" plan.

Association News

Reduced Fares for Annual Convention at Indianapolis

Reduced round trip fares will be in effect for those attending the annual convention of the National Federation of Radio Associations and the Radio Wholesalers Association, to be held at Indianapolis, Indiana, February 16 and 17, 1931. This convention will have its headquarters at the Hotel Lincoln, where the entire fourteenth floor will be devoted to meeting rooms. The entire hotel has been reserved for visiting radio tradesmen, and they are assured everything will be done to make their visit both enjoyable and profitable.

R. W. A. December Meeting

The next meeting of the Radio Wholesalers Association will be held about the middle of December in New York City. At this time the Board of Directors will be offered for approval a new "Suggested Code of Business Practices for Radio Dealers." The new code, if accepted, will be distributed throughout the radio trade as was done last year when some 20,000 copies were used. The Board will also consider further details for the coming convention, and other important matter which will be brought to their attention.

New R. W. A. Members

The membership campaign of the Radio Wholesalers Association, under the direction of Howard J. Shartle of Cleveland, Ohio, is progressing rapidly. It is hoped that within the next ninety days the membership of the R.W.A. will nearly double itself. The membership wishes to report the acceptance of the following as members of the association: The Brunswick Radio Corporation, Chicago, Ill.; W. G. Walz Company, El Paso, Texas; and Wilks Distributing Company, Jackson, Michigan.

Interference Campaign to Start at Once

The executive officers of the National Federation of Radio Associations and the Radio Wholesalers Association were authorized at a meeting in New York City to proceed with the campaign on the elimination of noises interfering with radio reception. It is believed that this campaign can be best handled through local trade associations. The national associations will assist them in establishing a functioning interference department.

Interference Booklet Soon Ready

The activities of the Pacific Radio Trade Association, San Francisco, under the direction of George H. Curtis, are the basis for the recommendations contained in a booklet soon to be issued by the National Federation of Radio Associations. Plans similar to those used by the Pacific Radio Trade Association will be established in Chicago and other metropolitan areas.

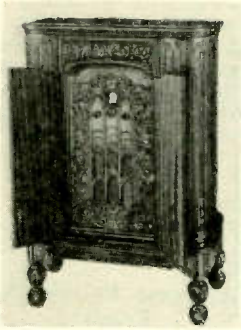
Supplementary Line Survey Progressing

The Special Supplementary Line Committee of the Radio Wholesalers Association, under the direction of Robert Himmel, President of Hudson-Ross, Inc., Chicago, Illinois, has been very active the last month. A recent survey among members reveals that a large percentage are now handling allied products.

Encyclopedia of

The Amrad Sondo

The rounded corners, sides, and front are of a new material known as "Carve-Art", made of multi-ply veneer with genuine walnut veneer outside, molded to form and reproducing the intricate designs of an original wood carving. The top and doors are of genuine five-ply veneer. The cabinet



contains two wells for records. The set and speaker are entirely new; tubes required are four screen grid type -24, one type -27, two type -45. and one rectifier tube type -80. Automatic volume control. A local-distance switch controls the powerful local stations. The dimensions are 42⅝ inches high, 28 inches wide, and 15½ inches deep.—*December Radio Sales and Service.*

The Crosley Arbiter

Contains a highly sensitive and selective screen grid neutrodyne, power

speaker, A. C. electric radio receiving set, and an electric phonograph housed in an attractive cabinet. The sides and top of the cabinet are of genuine five-ply walnut veneer, while the center panel is of Crosley Repwood, a new material that is molded to exactly duplicate the tool marks of a costly original wood carving. Automatic volume control is provided. The tubes used are: three screen grid type -24, one type -27, two type -45, and one rectifier tube type -80. Dimensions 35 inches high, 23½ inches wide, and 14¾ inches deep.—*December Radio Sales and Service.*

Stewart-Warner Combination

The top and sides of this attractive Stewart-Warner cabinet are of walnut plywood. The front is also walnut. The tone arm for phonograph reproduction automatically repeats each record as played indefinitely without

attention from the listener, and is adjustable to both standard 10-inch and 12-inch records. Equipped with Stewart-Warner radio and built-in switch for changing from phonograph to radio reproduction. Cabinet height, 45½ inches; width, 26¾ inches; depth, 18 inches. Made for 60 or 25 cycle A. C. or D. C.—*December Radio Sales and Service.*

Stromberg-Carlson No. 564

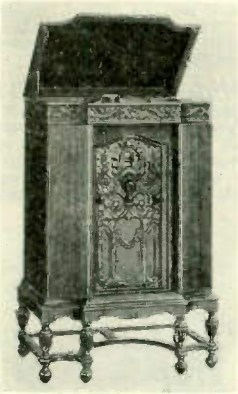
This combination, manufactured by the Stromberg-Carlson Telephone Manufacturing Company of Rochester, is incorporated in a distinctive walnut console of compact design. The unit has 3 control knobs; a single station selector; on-off switch; and a volume control which also acts as the phonograph switch. Uses A. C. screen grid tubes in 3 radio stages and 4 tuned circuits in the radio amplifier. Also makes use of a UY-227 tube as a linear power detector with automatic bias. The cone

Radio Combinations >

of the built-in dynamic speaker is of corrugated paper to avoid paper rattles. The phonograph turntable is equipped with a switch and automatic stop. A separate volume control is provided for the phonograph. Cabinet measures 46¼ x 27½ x 17½ inches.—*December Radio Sales and Service.*

Stromberg-Carlson No. 14

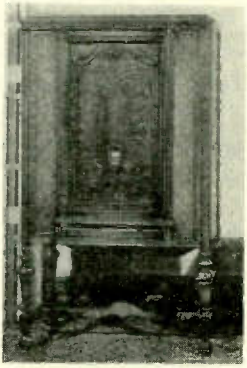
This new unit includes automatic volume control and an automatic record changing mechanism which accommodates assorted 10-inch and 12-inch records. The automatic record changer plays twelve to fourteen records of either 10-inch or 12-inch size without attention. The two sizes of records can be mixed and records can be rearranged without interrupting the record being played. This combination is housed in an attractive cabinet of massive con-



struction, all exposed surfaces being solid walnut. The receiver uses three UY-224 screen grid tubes, a 227 type in the power detector and in the first audio stage, and two UY-225 tubes in the output stage. Automatic volume control and a visual tuning meter are also included.—*December Radio Sales and Service.*

Automatic Radio-Phonograph Combination

The Columbia Phonograph Company, New York City, has added an automatic radio-phonograph combination to its new line of radio sets. This embodies the radio receiver chassis 100, an eight-tube screen grid receiver with four tuned circuits using three '24 tubes in the radio frequency tubes, one '24 in the detector. Super sensitive for distance stations and micro-selective. The automatic



phonograph mechanism is designed to play nine records in sequence automatically, rendering from 25 to 45 minutes of uninterrupted performance. Any record can be repeated at will. An English Walnut console type cabinet is used, having a center panel of matched walnut.—*December Radio Sales and Service.*

The General Electric

DIMENSIONS: Height, 45 inches; width, 27½ inches; depth, 18 inches; net weight, 162 pounds.

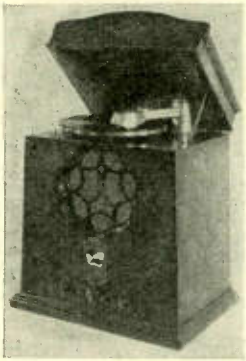
CABINET: Massive design. Brown walnut with satin finish. Closed

type with narrow doors which do not project beyond side of cabinet when open.

CHASSIS: Super-heterodyne circuit, 9 tubes, 4 of which are screen-grid. Dynamic speaker. Tone control. Local-distant switch. Phonograph, embodies new improved electrical reproduction, employing same tone control as radio. Specially equipped to permit the recording of radio programs and also voice and music in the home. New improved remote control at additional cost. —*December Radio Sales and Service.*

Midget Combination

The Cardinal Radio Manufacturing Company, of 2812R S. Main St., Los Angeles, California, are making a midget combination which includes a completely shielded screen grid circuit



employing six tubes, an electric pick-up, electric motor, automatic stop on phonograph, and a Magnovox Dynamic Speaker. The unit is very compactly built—an excellent unit combination in small space.—*December Radio Sales and Service.*

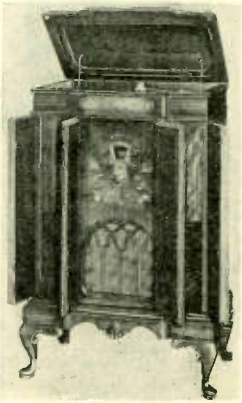
Sparton Model 235

The new Sparton Ensemble, Model 235, Combination Radio and Automatic Phonograph, made by Sparks-Withington Co. of Jackson, Michigan, contains a set employing ten factory matched tubes; seven type C-484 two type C-183, one type C-280. The radio receiving set in this model is equipped with an antenna compensating condenser. The phonograph division comprises a high output pickup unit which works directly into the power detector tube located in the amplifier unit. An individual volume control for the radio and phonograph is provide. On completion of each record selection the phonograph automatically stops and current to the power converter is cut off. The automatic record changing mechanism is very unique and requires only four seconds to change records. The cabinet is constructed of five-ply striped walnut

veneer and the doors are of highly figured butt walnut veneer, both inside and out. Cabinet dimensions: height 44½ inches, width 28 inches, and depth 19 inches.—*December Radio Sales and Service.*

Majestic Model 233

The Model 233, manufactured by the Grigsby-Grunow Company, 5801 Dickens Ave., Chicago, Illinois, is enclosed in a Queen Anne Period cabinet in walnut with doors and control panel in grained matched butt walnut. In-



cludes a new Majestic super-screen grid chassis and a new Super-Colotura Speaker. Lifting the top discloses electric motor and electric pick-up phonograph reproducing through radio speaker.—*December Radio Sales and Service.*

All-American Lyric

Made by the All-American Mohawk Corporation, 400 W. Madison St., Chicago. Has a beautiful cabinet of

Tuscan design, styled to please the most discriminating taste. A very substantially built cabinet with superlative finish. Equipped with All-American Lyric chassis. Height 40 inches; width 25 inches.—*December Radio Sales and Service.*

Edison Light-O-Matic

A combination all-electric radio and phonograph in a massive studio cabinet. Edison electric pickup. Automatic stop

that operates without setting, on all makes of records. Blended walnut finish, with sliding doors of matched butt walnut and front relieved with butt walnut panels. List Price $325, less tubes. (Slightly higher in far West.)—*December Radio Sales and Service.*

(Continued on page 86)

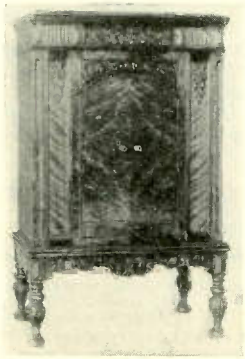
Clarion Model A.C. 55

This combinantion. manufactured by the Transformer Corp. of America, 2309 South Keeler Avenue, Chicago, includes a standard eight-tube screen grid Clarion chassis and a constant speed heavy duty Clarion turntable motor in an attractive console of mod-

erate size.—*December Radio Sales and Service.*

Combination Fada 47

This model, made by the F. A. D. Andrea, Inc., Long Island City, New York, is enclosed in a beautifully finished cabinet. Features included are flashograph tuning, automatic volume control, local distance switch, a Fada designed dynamic speaker, two ele-



ment detectors, pre-selector tuning, and a Fada nine-tube completely shielded chassis.—*December Radio Sales and Service.*

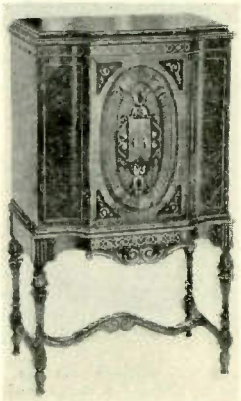
Atwater Kent Model 75

The Atwater Kent Model 75 Radio-Phonograph combination, manufac-

tured by the Atwater Kent Mfg. Co. of Philadelphia, is 40 inches in height, 24 inches in width, and 17 inches in depth. It is finished in hand rubbed American walnut with matched butt walnut doors and panels. The top is piano hinged with an automobile top support.—*December Radio Sales and Service.*

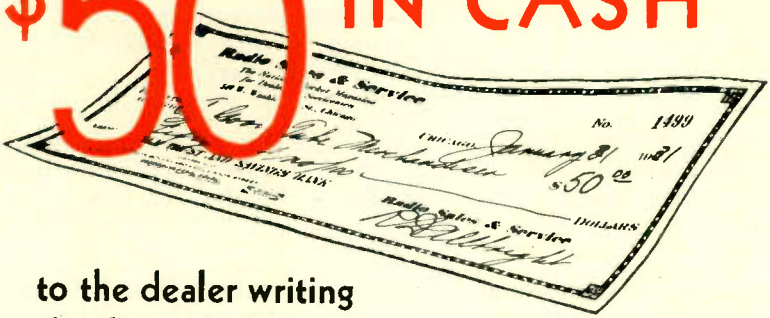
Kennedy Royal 726

Kennedy Royal Model 726, manufactured by the Colin B. Kennedy Co. of South Bend, Indiana, is furnished in an exquisitely finished cabinet. It is equipped with the new Kennedy Royal dual chassis employing eight



tubes, extra large dynamic speaker, selectone control, tapered double volume control, automatic line voltage regulator.—*December Radio Sales and Service.*

$50 IN CASH



to the dealer writing the best letter on « « « radio tube » » » merchandising

A TUBE replacement sales campaign will help materially in carrying your overhead during the dull months of radio merchandising.

RADIO SALES AND SERVICE will pay $50.00 in cash to the dealer sending in the best letter on merchandising radio tubes.

Here are the points by which the letter will be judged:

1. *The letter must be signed by a bona fide radio dealer and be based on his actual tube merchandising experience.*
2. *It must show methods used, costs, sales volume, and resulting profit.*

All letters must be received by RADIO SALES AND SERVICE, 549 W. Washington St., Chicago, on or before January 25, 1931. Results will be published in the February issue of RADIO SALES AND SERVICE. The judges will be two prominent radio jobbers, the sales managers of two prominent tube manufacturers, and the publisher of RADIO SALES AND SERVICE.

Some Comments from Radio

"This is the first time I have had the pleasure of reading your magazine. I think it's great, and look forward to receiving copies of future issues."—*Wm. E. Boyer, Plainfield, N. J.*

"I just read your magazine and think it is the best out. I subscribed to Radio Craft, Q. S. T. and Radio Design, but gave them up because they are the usual stuff."—*Charles Fournsel, Ridgewood, N. Y.*

"The October 15th number of RADIO SALES AND SERVICE is the first number of your magazine I have had the pleasure of reading. The editorial on 'Good Radio Merchandising and Good Radio Service Are Inseparable,' I think strikes the keynote in getting business."—*H. E. Rice & Company, Waldron, Ark.*

"Your magazine is great!"—*Kenneth L. Johnson, Chicago, Ill.*

"I want to take this opportunity to commend you on your excellent magazine. I find it a very useful magazine for my occupation."—*Howard T. Bailey, Kennett, Mo.*

"The October issue of RADIO SALES AND SERVICE is the first one I have received. You are to be complimented on this little magazine because it fills a long felt need in this business."—*Jack Irish, West Hartford, Conn.*

"I received your magazine and it looks very good to me."—*R. Costabile, Chicago, Ill.*

"Permit me to compliment you upon your publication—it is one of the best things of its kind I have seen."—*A. M. Terry, Aiken, S. C.*

"Your magazine is one of the best I've read for the serviceman, as the information is practical. I believe the serviceman is fed up on reading bunk by some conception writer just to fill up a book and get your dough. This is my twentieth year on Radio, starting back in the old spark days in 1908."—*J. W. Gibbons, Port Jervis, N. Y.*

Sells 1000 Radio

Foreign Language Broadcasts an Important Factor

As told by
J. F. Budrik

FROM October to October, 1929 and 1930, Joseph F. Budrik, 3417 South Halsted Street, Chicago, who profitably cultivates a large Lithuanian following, sold one thousand radio-phonographs. People who speak two tongues like to hear both in their entertainment. In the case of Chicago's numerous Lithuanian people many of the elders still get along much better in their native speech to which their children frequently have an understandable attachment. Keenly sensing this inevitable pull of background, Mr. Budrik directs his radio business accordingly.

Sales and Service Readers

"Your magazine has many good sales and service features."—*G. Robinson, Boston, Mass.*

"Congratulations on your fine little magazine!"—*Frank C. Bascomb, Newark, N. J.*

"We enjoy this little magazine very much."—*Jones Music Co., Spokane, Wash.*

"I just received your very good magazine. Please keep it coming."—*Hoopeston Tire and Radio Co., Hoopeston, Ill.*

"By the way, that's a *great big* little magazine!"—*Lewis Radio Service, Tillamook, Oregon.*

"Just a word on what I think of your little magazine. It is absolutely the best (bar none) that I have ever read, and I certainly appreciate your putting me on your list to receive it."—*Herman Cornett, Jr., Beggs, Oklahoma.*

"Your magazine contains many things which should be of great interest to anyone interested in radio, and is very cleverly 'gotten up'."—*William Garden, Jr., Lancaster, Pa.*

"Received your magazine. Just what we have been looking for."—*Forest Rhoads, Dayton, Ohio.*

"I don't know who is sending me this little magazine, but whoever is is doing a real favor to me, because I like it very much. Its size and information are ideal."—*C. S. Kluger, Swea City, Iowa.*

"I have been receiving your little magazine. It is well gotten up and always has good articles in it. I always enjoy reading your publication and get many ideas from it."—*Joseph Fairhall, Jr., Danville, Ill.*

"I get a good deal of helpful information from your magazine, because I run my own business."—*Frank S. Andrus, Flint, Mich.*

"I certainly enjoy your magazine and look forward to every issue."—*Homer Swaby, Forrest City, Ark.*

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radio service equipment to buy

TONS

utation for quality testing on actual performance— sing claims. Only Weston ndability. For this reason, eir outstanding superior de- meet the exacting require- dealers and service men.

MODEL 566

A two meter set tester with facilities for checking tubes under same conditions as exists when in their sockets.

Servicing Scope of Model 566

WITH THE TESTER PLUG INSERTED IN THE RADIO SET:—

All filament and heater voltages. 2 cathode, 3 bias, and 2 control grid voltages. 3 plate voltages. 2 screen and 3 plate current ranges. Bias voltage on D.C. sets with reversed filament. Both plates of full-wave rectifier tubes.

EXTERNAL TESTS:—Power transformer up to 1,000 volts A.C. Line and all heater and "B" voltage supply voltages at power pack. All plate currents at "B" supply taps. All "A", "B", and "C" voltages. Continuity tests using contained battery and D.C. volt-meter with 1,000 or 100 ohms per volt. Resistance measurements using Volt-ohmmeter with range 0-100,000 or 0-10,000 ohms. Condenser measurements—1/4 to 6 microfarads. Checks all filament or heater type tubes under conditions as when in their sockets. Filament or heater current of A.C. tubes. Input to radio set. Measurement of currents in voice coil of speaker, etc. Rectifier type Output Meter range 5/100 Volts.

To cooperate with those temporarily affected by the current business recession, Weston makes it possible to obtain the best in service equipment on a convenient payment plan. Write for details.

ems —Write for Circular H H

Equipment MODEL 566

A. C. VOLT-AM-MILLI-AMMETER
with 9 ranges of 1000/-200/16/8/4 volts, 100/-20 milliamps, and 8/4 amps.

D. C. VOLT-OHM-MILLIAMMETER
with 10 ranges of 1000/-250/100/25/10 volts, 100,000 / 10,000 ohms and 100/25/2.5 milli-amps controlled by 23 point Bi-polar switch with index markings.

POLARITY REVERSING SWITCH

DIRECT READING OHMMETER

OUTPUT METER (Rect. Type)

CONDENSER METER

Binding Posts, Leads and Tester Plug.

TRUMENT CORPORATION

Newark, N. J.

out page and pin to letterhead

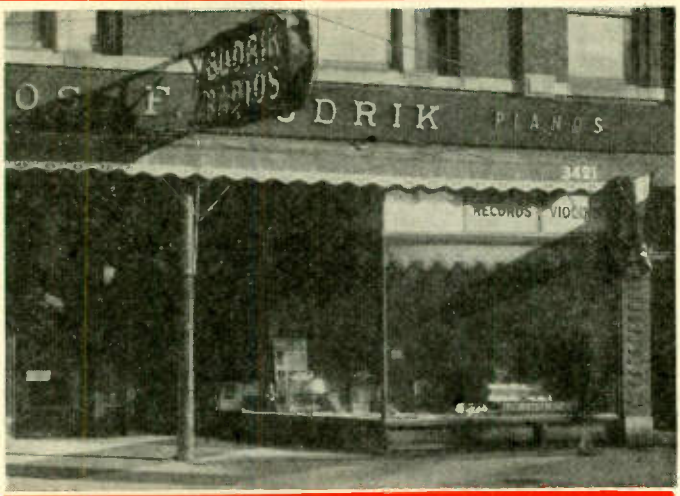
Sells 1000 Radio

Foreign Language Broadcasts an Important Factor

As told by
J. F. BUDRIK

FROM October to October, 1929 and 1930, Joseph F. Budrik, 3417 South Halsted Street, Chicago, who profitably cultivates a large Lithuanian following, sold one thousand radio-phonographs. People who speak two tongues like to hear both in their entertainment. In the case of Chicago's numerous Lithuanian people many of the elders still get along much better in their native speech to which their children frequently have an understandable attachment. Keenly sensing this inevitable pull of background, Mr. Budrik directs his radio business accordingly.

Phonograph Combinations



From Jewelry and Music to Radio

Originally the Budrik establishment was a jewelry and music store. But when that still lusty youngster, radio, breezed into the mercantile picture a few years ago this alert merchant immediately became attentive. Soon he was in the thickest of radio merchandising development. It didn't take him long to see and analyze the swing of his trade toward the combination set. Among his customers are also many Poles; they and the Lithuanians make up a big share of the population in that quarter of Chicago.

Of course, this important retail market covered by Mr. Budrik is not confined to the sale of dual-purpose machines; plenty of radios, without phonographic functions, are sold; for it is also true that the second and third generations, in increasing number, really feel more at home when they hear English. Many can speak and understand no other tongue. Nevertheless they are all more or less group-conscious and the special appeal made by Mr. Budrik brings him the reward that every radio dealer covets—profit-yielding patronage.

Combination Owners Come Back for Records

One big factor that keeps this sort of friendship for the firm flourishing is the series of "Luthuanian Hours" to be heard over WCFL and WHFC. Joseph F. Budrik is solely responsible for them. He pays the bills and has an influential finger in all the arrangements. Records of Lithua-

nian dialog and music are broadcast.

These records are coded and the numbers announced over the air. Evidently they start the pencils scribbling memoranda, for people come to the store and ask for the records; in each case they are given a demonstration of a combination set and frequently they buy. And after that, of course, they keep on buying records. Thus is set up a constant flow of repeat business.

Recently Mr. Budrik conducted a contest among the artists on his programs. Money and merchandise to the value of more than a thousand dollars were offered as prizes for the Lithuanian singers deemed superior by the radio audience, requested to vote by mail. This competition aroused much interest. The only stipulation was that the songs must be sung in Lithuanian. Mr. Budrik sought to develop new as well as known talent. Contestants who could qualify were invited to register at the store and did.

Now and then Mr. Budrik conducts a "Test Program" over the air. Records calculated to bring out the reproductive qualities of a combination set are played at the sending station; then the announcer plants this question in the listener's mind: "Is your old set giving you good music?" Frequent sales are credited to this broadcasting feature.

Three servicemen with cars and complete repair kits keep the Budrik-sold sets in the pink of performance. They extend themselves to give every possible help.

Radio-Phonograph Combinations

(Continued from page 27)

Zenith Model 75

A radio phonograph combination manufactured by the Zenith Radio Corp., 3620 Iron St., Chicago, which includes a Zenith 70 screen grid chassis using nine tubes with rectification, a super-size dynamic type speaker, a new automatic record changer, and an improved pickup enclosed in a magnificent console of authentic Tudor period. Handsome carvings and finest detail enhance richly

grained walnut and birch. Dimensions, 43x29⅝x17¾ inches.—*December Radio Sales and Service.*

The Howard Combination

Manufactured by the Howard Radio Company of South Haven, Michigan. Equipped with the new 1930-31 Howard Precision Screen Grid Receiver and Phonograph Pickup. Employs three screen grid tubes, power detector, push-pull audio. Electro-

dynamic speaker individually tone matched. Priced $325.00, less tubes.—*December Radio Sales and Service.*

Keeping Up With the Times

The literature listed below will be sent free (except when otherwise marked) to readers of RADIO SALES AND SERVICE. Check the items in which you are interested. Write your name, company, and address on the coupon provided on the next page. Tear out the page and mail to us. Take advantage of this easy method of securing helpful information about radio merchandising and servicing.

☐ *Volume Control Guide (Price 25c)*

A very complete booklet describing how to replace and how to use replacement units for various types of volume controls found in most popular sets. **Central Radio Laboratories.**

☐ *Power Amplifiers*

A set of leaflets describing various sizes of power equipment suitable for any type of installation. Valuable information concerning how to choose the proper equipment for any installation. **American Transformer Corp.**

☐ *Radio Test Equipment*

Four interesting leaflets describing test equipment for servicemen which greatly facilitates service work on any set. **Hickok Electrical Instrument Company.**

☐ *Chart of Voltage Controls*

A chart that specifies the size and type voltage control necessary for installation on any popular set. Various receivers draw different amounts of current. This necessitates a number of sizes of line ballasts to accommodate all receivers. **Amperite Corporation.**

☐ *Tube Replacement Chart*

A great deal of time is often saved if the serviceman can tell exactly what tubes he will need before making a service call. This may be determined from a handy tube replacement chart. **CeCo Manufacturing Company.**

☐ *Gateway to Better Radio*

A 34-page booklet describing the various means of bringing a radio set up-to-date by adding such features as line voltage control, remote volume control, tone control, or replacing old style tubes with later types. **American Mechanical Laboratories.**

☐ *Sound Equipment*

An interesting booklet of equipment for all public address purposes. Many sizes and types of amplifier units, indoor and outdoor horns, and synchronization units for theatre installations are included. **The Amplion Corporation.**

☐ *Servicemen's Resistance Replacement Guide (Price 50c)*

A manual to assist the servicemen in replacing faulty resistors on radio receivers. Contains over 100 circuits giving tables on various receivers. This guide is kept up-to-date by frequent additions sent out by the publisher. **International Resistance Co.**

☐ *Elimination of Oil Burner Interference*

A complete discussion of the methods and equipment necessary for elimination of radio interference from various types of oil burners. **Tobe Deutschmann Corporation.**

☐ *Time Payment Plan for Purchasing Radio Test Equipment*

A plan whereby complete radio service equipment may be purchased with the extra earnings secured by their use. **Supreme Instruments Corporation.**

☐ *Condenser Replacement Chart*

A wall chart from which replacement condensers may be chosen for most popular makes of receivers. Complete specifications are given and the list price of the replacement unit is shown. **The Potter Company.**

☐ *Uses of Shielded Wire*

Interesting information about reduction of interference by the use of shielded wire for lead-in and ground connections. Many helpful hints for stubborn interference problems. **Belden Manufacturing Company.**

☐ ***The Photolytic Cell***
An interesting description of photo-electric phenomenon, of valuable uses for photoelectric cells, and of construction of light operated signal systems. **The Arcturus Radio Tube Company.**

☐ ***"The Better or You Don't Pay" Campaign***
Complete description of a new tube merchandising idea based upon selling replacement tubes with the guarantee that they are better than your present tube equipment or you don't pay for them. A complete summary of the guarantee, sales stimulating window displays, newspaper and direct mail advertising that backs this plan. **CeCo Manufacturing Company.**

☐ ***Radio Instruments***
The catalog of a popular priced line of radio instruments suitable for use by servicemen. Includes set analyzers, tube testers and portable meters. **Readrite Meter Works.**

☐ ***Radio Convenience Outlets***
A catalog of the plug-in outlets that are available for wiring aerial leads, ground leads, battery leads, and speaker leads. Descriptions are given of wiring systems for group radio sets such as are used in hotels, apartments, and hospitals. **Yaxley Manufacturing Company.**

☐ ***Radio Simplified***
The father of radio, Lee DeForest, has written a very interesting book graphically describing the underlined theories of radio reception. A glossary of radio terms and nomenclature is included. **DeForest Radio Company.**

☐ ***R. M. A. Interference Manual***
A manual describing the sources and methods of suppression of radio interference prepared by the **Radio Manufacturers Association.**

☐ ***Radio Noises and Their Cure (Price 25c)***
The "How and Why" of radio interference and exactly what equipment is needed to eliminate such interference. Methods for elimination at the source and how to prevent unwanted variations from entering radio receiver. **Tobe Deutschmann Corporation.**

Information on the following subjects:

- ☐ Aerial Equipment
- ☐ Auto-radio Sets
- ☐ Ammeters and Voltmeters for Radio Service Work
- ☐ Automatic Phonographs
- ☐ Coin Control for Radio Sets
- ☐ Condensers, Replacement
- ☐ D. C. to A. C. Power Converters
- ☐ Electric Phonograph Pickups
- ☐ Electrolytic Condensers
- ☐ Electric Clocks
- ☐ Electric Signs
- ☐ Home Recording Phonographs
- ☐ Line Voltage Regulators
- ☐ Microphones
- ☐ Phonograph Motors
- ☐ Replacement Resistance Units
- ☐ Set Testers and Analyzers
- ☐ Sockets, Replacement
- ☐ Sound System Equipment
- ☐ Speakers, Dynamic
- ☐ Sun Lamps
- ☐ Transformers, Replacement
- ☐ Tone Controls
- ☐ Tube Checkers and Testers
- ☐ Vacuum Cleaners
- ☐ Volume Controls, Replacement
- ☐ Washing Machines

Tear out page and mail to
RADIO SALES AND SERVICE
549 W. Washington St., Chicago, Ill.

Name .....

Firm .....

Address .....

New Products Section

Attractive New Model Announced by Crosley

The "Administrator" announced by Crosley has automatic volume control which can be varied instantly and at will, and which brings in practically all stations with deeper volume and largely eliminates fading. When once adjusted it maintains all

stations at an approximate level volume. The chassis uses a triple screen grid circuit requiring three screen grid tubes, type 24, one type 27, two type 45 and one rectifier tube, type 80. The latest type Crosley moving coil dynamic power speaker is supplied. The dimensions are 36¼" high, 23½" wide and 13¾" deep.—*December Radio Sales and Service.*

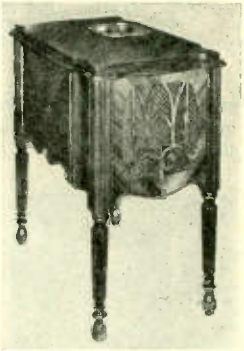
The Crosley "Buddy Boy"

The Crosley Radio Corporation of Cincinnati, Ohio, has announced the "Buddy Boy" model, a beautiful

mantle, table, or clock type radio popularly known as a "midget" set. The "Buddy Boy" is a sensitive and selective screen grid, neutrodyne, power speaker, A. C. electric receiver, with remarkable tone qualities. The "Buddy Boy" is so light in weight and small in size as to be readily movable from place to place in the home, or from house to house.—*December Radio Sales and Service.*

The Gulbransen Minuet

A new, small, compact radio receiver built in end-table form was recently placed on the market by the Gulbransen Radio Company of 3232 W. Chicago Aveue, Chicago. Volume and tone quality equal to that of a fine console receiver are claimed for this new radio. The Minuet form is very convenient, as it may be moved from



one room to another without effort. The chassis of this new receiver requires from 3 No. 224 screen grid to 1 No. 227 detector and amplifier, 2 No. 245 power and 1 No. 280 rectifying tubes. The cabinet is attractively designed and orientally finished in walnut.—*December Radio Sales and Service.*

32-Volt D. C. Converters

The November issue of RADIO SALES and SERVICE incorrectly listed the address of the Kato Engineering Company. This firm is located at Mankato, Minnesota, and manufactures both 32-volt D.C. and 100-volt D.C. converters for use in supplying A.C. power to A.C. receivers from farm light or D.C. power systems. These units permit the operation of A.C. circuits of D.C. sources with the same satisfaction as when 110 volts A.C. is available.—*December Radio Sales and Service.*

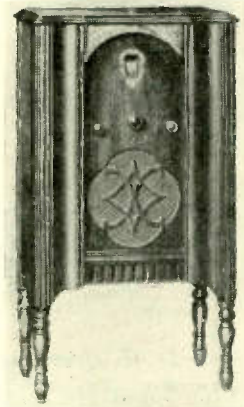
New Steinite Junior

The Steinite Radio Corporation of Ft. Wayne, Indiana, has announced a new midget receiver called the Stein-

ite Junior. A six-tube chassis is used, including such features as tone control, local-distance switch, phonograph connection, triple-screen-grid, three tuned circuits, power detection, '45s, push-pull, cadmium plated chassis, and extra powerful dynamic speaker.—*December Radio Sales and Service.*

New Steinite Consolette

The Steinite Consolette uses the same chassis and speaker as the



Steinite Junior Midget Receiver. For those who desire the reduced low-boy type cabinet, this is a very attractive set.—*December Radio Sales and Service.*

The Austin Mantle Set

The Austin A. Howard Corporation of Chicago, Ill., in answer to the demand for a compact and economical receiver that makes no sacrifice in quality of construction, has developed the New Austin mantle type receiver. All the advantages of compact construction are retained but no sacrifice in sensitivity, selectivity or tone quality is made. An unusual mounting of the large dynamic speaker in the top of the cabinet permits unequalled distribution of

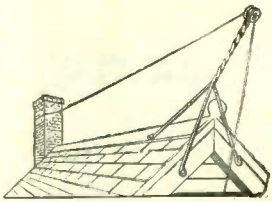
sound. Screen-grid radio frequency amplification, and push-pull output stage, are some of the latest refinements to be found in this receiver. —*December Radio Sales and Service.*

Midget Antenna Mast

An unusual aid in constructing aerials on sloping roofs is made by the Solter's Midget Antenna Mast Company of 418 R Boston Block, Minneapolis, Minnesota.

This "Midget Mast" mounts in any position on a roof, allowing an aerial to be erected with a minimum of labor. When mounted in this manner, an aerial has a very neat appearance.

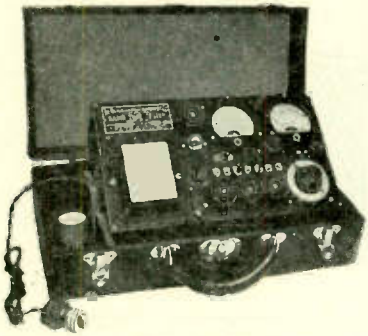
It consists of a short metal mast supported on three legs having holes in their feet, through which may be put nails or screws to hold it in place.



At the top of the mast is an insulator to which the aerial wire may be fastened.—*December Radio Sales and Service.*

Hickok Tube Tester

The Hickok Electrical Instrument Company of Cleveland, Ohio, manufactures a very complete tube tester that is available in a portable form. This tube tester was designed to give radio men a device that will test tubes in a more complete manner than the ordinary tester which reads emission only. Dynamic mutual conductance is read in a very simple manner.



All standard type tubes may be quickly and accurately measured and for the heater type tubes such as 224, 277, etc., a special pre-heater can be supplied which makes testing of these tubes as rapid as the ordinary filament type. Operation of testing the tube in the Hickok Radio Tube Tester is very simple; requires only a setting for the proper filament voltage and a second setting for the proper grid bias. *December Radio Sales and Service.*

Weston 2-Meter Set Analyzer

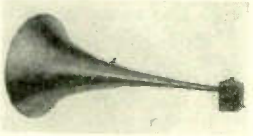
A set analyzer employing two meters has been announced by the Weston Electrical Instrument Corporation of Newark, New Jersey. This set tester has facilities for making tests of all set circuits at the tube socket. Also enables checking of tubes under the same condition as exists when in other sockets. Selection of circuit tests is by means of a rotary switch. Binding posts are provided for making external tests with any of the ranges provided on the two meters. The equipment of the Model 566 is an A. C. voltmeter, an A. C. ammeter, a volt-ohm-milliammeter, rectifier type output meter, and a condenser meter. *December Radio Sales and Service.*

Weston Circuit Tester

The Weston Electrical Instrument Corporation, Newark, New Jerey, is offering a new instrument for use in checking radio and allied equipment circuits. It permits rapid checking of resistance values and continuity of circuits during installation and service of radio equipment. It consists of the Weston Model 301 3¼-inch diameter meter having two resistance ranges, 5,000 to 50,000 ohms, mounted in a black bakelite case with a bakelite panel; a toggle switch for range selection; a self-contained 1.5 volt flash-light cell; a leather strap carrying handle, and a pair of 30-inch leads with test prods.—*December Radio Sales and Service.*

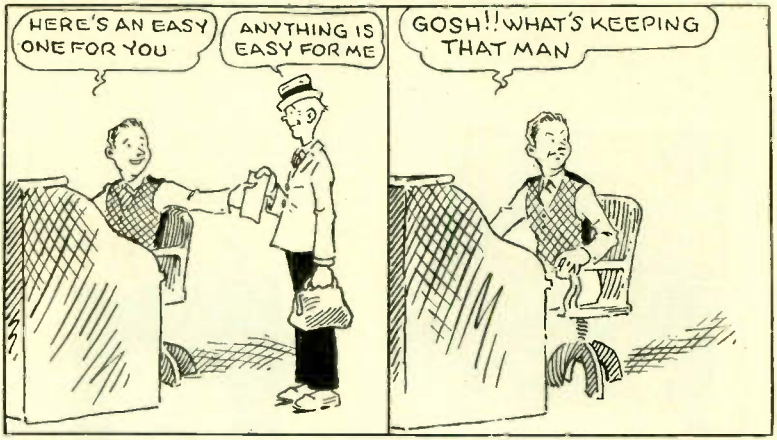
Hyflux Trumpet

Wright-DeCoster, Inc., of St. Paul, Minnesota, manufacture an exponential type horn fitted with a very powerful magnetic unit for use in outdoor sound installations. This unit is light enough to be easily handled and is therefore adaptable to all kinds of temporary sound installations. The double magnet in the unit of the Hyflux Trumpet allows it to handle a great deal of power without reducing its efficiency. The Hyflux Trumpet will stand any kind of weather. Total length 3 ft. 9½ in. Opening at bell 20 in. Normal operating input 1½ watts. *December Radio Sales and Service.*



(Continued on page 63)

Jack and Larry



Interpreting Set Analyzer Readings—*Part 3

By A. E. Hoover

HAVING discussed power packs and the tests to be made on them, our next step will take us into the receiver chassis itself.

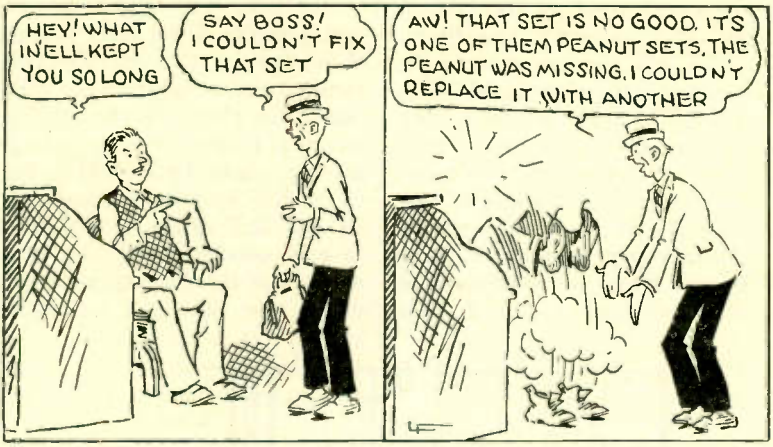
Servicemen in general test the detector and audio circuits first, since it is somewhat simpler to determine whether they are working properly. After they are in correct condition it is easier to determine the location of trouble in the radio frequency stages.

There are two types of detector circuits in common use: the grid rectifier and the plate rectifier. The grid type was universally used until a year or so ago, but now the plate type of detector has completely ruled it out. We will not go into a discussion of the relative merits of these detectors, since they are well known, but will study the defects which are ordinarily found in this stage. For the purpose of easy explanation we have prepared the circuit of the grid detector (Fig. 7) and the circuit of the plate detector (Fig. 8).

The grid detector operates at a low plate voltage, generally from 22 to 45 volts, without grid bias, while the plate detector operates at a high plate voltage (from 90 to 220 volts) with a high grid bias (20 to 30 volts). In the circuit diagrams we have indicated the position of the voltmeters and milliammeter by using their symbols (V), (V_1), and (A). These positions are assumed when the test plug of the analyzer is inserted in the detector socket and with the

*Previous installments may be had by mailing 20 cents in stamps for each back issue of RADIO SALES AND SERVICE.

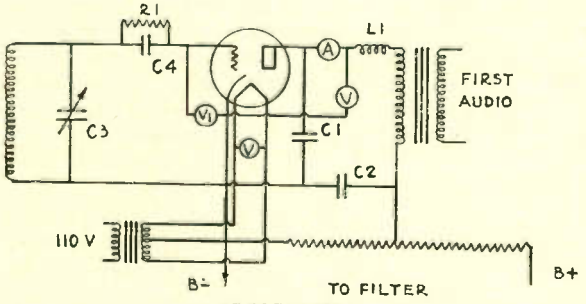
He Cuts Out the Whistle



tube in the test kit, and when the various buttons or switches are set for the desired readings.

Test Filament First

The first test should be for filament voltage. The tests as we will outline them apply to filament tests throughout the chassis and will not be repeated later when we take up the study of radio and audio frequency circuits. In testing filament voltage, the alternating current voltmeter is connected across the filament of the tube. The reading should be within 10 per cent plus or minus of the rated filament voltage of the tube. If the voltage is found to be high and it has been determined that the line voltage and line voltage adjusting switch (in the power pack) are proper, the condition should be corrected by inserting pieces of resistance wire in series with each of the filament leads. The same amount of resistance should be present in each lead in order that the transformer center tap or center tapped resistance remain in the same electri-



Grid Detection

cal relation to the filament leads. To upset this balance would in most cases cause an increase of hum. It is necessary, also, to use wire of sufficient size to carry the amount of current consumed. With 226's, 227's, 245's and 250's, wire of 24 gauge is about right, but if several of these tubes are connected in parallel it would be well to use No. 16 or No. 18. If the filament voltage is too low, place the tube back in its position in the chassis and with test leads connected to the alternating current voltmeter, test the voltage at the point where the filament leads leave the transformer. If it is low at this point and the line voltage and line voltage adjustment switch are correct, it will be necessary to replace the power transformer. If the voltage is normal at this point, the trouble will be found to be a high resistance joint somewhere in the filament leads. It may be a poorly soldered joint or in those sets using riveted or screw terminals, a poor connection at any of these points. A connection that would be good for higher voltage, lower amperage conditions may be poor when forced to carry a low voltage, high amperage current.

Plate Voltage at Detector Socket

The next test at the detector socket should be for plate voltage. When making this test, the voltmeter is connected from the cathode to the plate. In the grid detector a failure of plate voltage may be caused by a short circuit of the R.F. by-pass condenser, C_1; an open R.F. choke, L_1; a shorted by-pass condenser, C_2; an open primary of the audio transformer, or in the case of resistance coupled audio, in an open plate resistor.

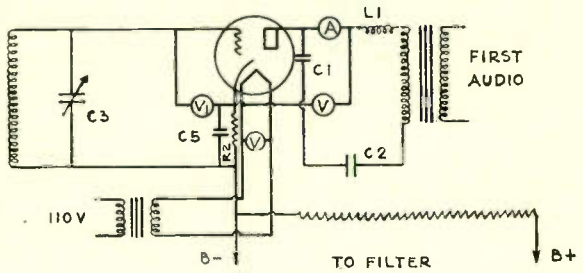


Plate Detection

The cathode of the tube, also, may not be connected to B—, or the B+ connection to the audio transformer and voltage divider may be open. To determine which of these defects is present, it is only necessary to use the continuity test and eliminate the parts one by one.

There should be no grid voltage present, but if the plate voltage is O.K. there will be a normal amount of plate current depending upon the type of tube and the amount of plate voltage. The grid circuit should be checked for continuity of the secondary of the R.F. coil and for connection to B—. The tuning condenser C_3

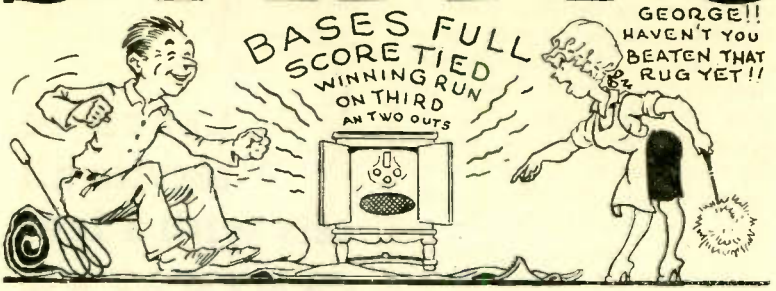
should be checked for short circuit by unsoldering either of its connections to the R.F. coil. A rather common defect at this point is a short in the small trimmer condenser connected across the main variable. The grid condenser C_4 should also be checked for short circuit. A short at this point will cause the receiver to be inoperative shortly after the set is turned on, due to the blocking of the grid. It is impossible to test the grid leak with equipment of the type usually carried by servicemen, but if this part of the circuit is in doubt it is easy to try new grid leaks of different values. This part of the circuit is not critical.

Same Tests for Grid and Plate Detectors

In the plate type of detector the tests are the same as for the grid type, except that there should be considerable grid voltage and, of course, the plate voltage should be much higher. The plate current of the tube with no signal present should be about zero. The plate voltage tests are identical with those to be made for grid detectors, except that an absence of this voltage can be caused by an open grid resistor R_2. This resistor being open would also be reflected by a test for grid voltage. The voltmeter, when making this test, is in effect connected directly across the grid bias resistor, so that when this resistance opens up the resistance of the meter takes the place of it. Under this condition the plate current of the tube will flow through the meter

(Continued on page 59)

STATIC



All Year Open Season

Some radio dealers often wonder, with the closed season on duck hunting and deer hunting, why there isn't one on bargain hunting for low priced midget receivers.

* * *

Johnny: "What is a philosopher?"

Father: "A radio serviceman who doesn't swear when he brings a set of a.c. tubes to service a d.c. set with."

* * *

Way Down in Hades

Shade of One Radio Serviceman to a new arrival: "Oh, I'm just the first guy who tried to throw an aerial over a power line."

* * *

Imagine my embarrassment when after tracing a "skip" through six states I found he had traded my set in for a midget receiver at a near-by dealer.

* * *

Way Back When

A radio set had one tube and seven controls—now it has one control and seven tubes.

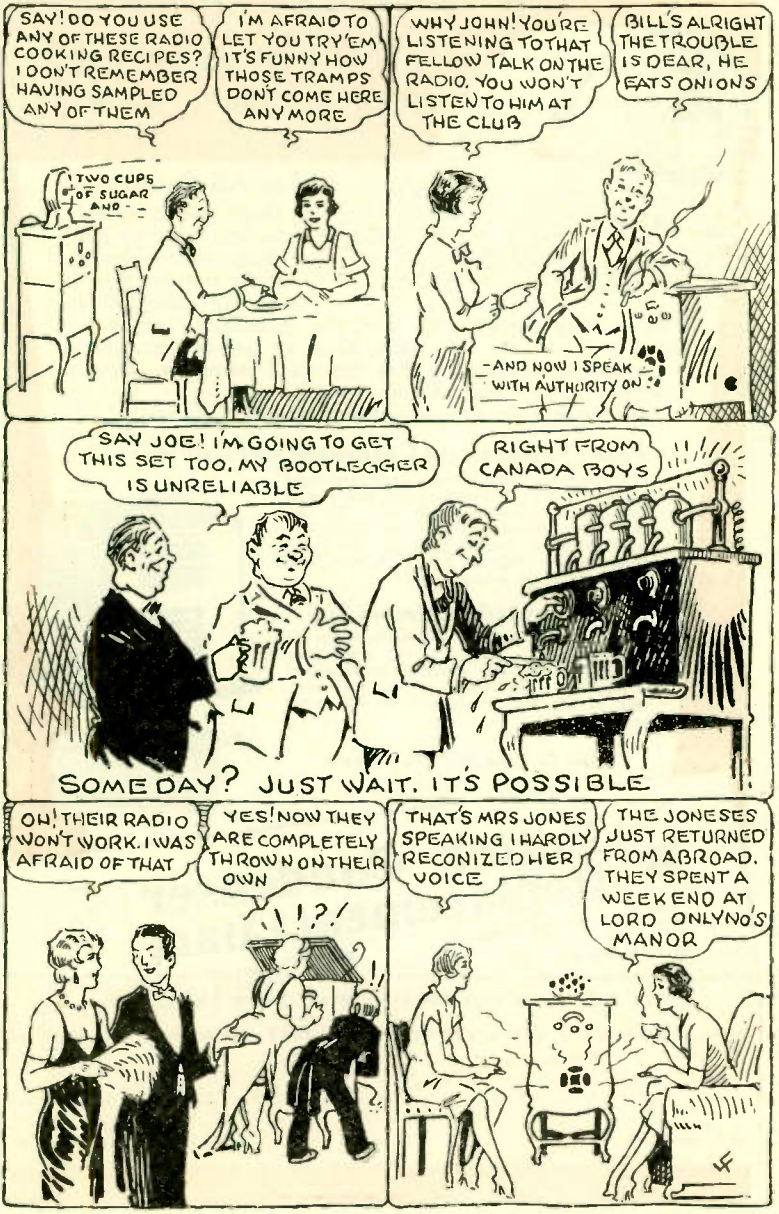
* * *

Wonder if some of the interference campaigns being waged by various organizations could not be arranged to eliminate radio programs that advertise face powder and perfume?

* * *

The latest radio sets look like clocks and the latest clocks look like radios—thus necessitating care lest one wind up the radio and try to tune the clock.

RADIO AN' HOW!!!


SAY! DO YOU USE ANY OF THESE RADIO COOKING RECIPES? I DON'T REMEMBER HAVING SAMPLED ANY OF THEM
I'M AFRAID TO LET YOU TRY 'EM IT'S FUNNY HOW THOSE TRAMPS DON'T COME HERE ANY MORE
TWO CUPS OF SUGAR AND
WHY JOHN! YOU'RE LISTENING TO THAT FELLOW TALK ON THE RADIO. YOU WON'T LISTEN TO HIM AT THE CLUB
BILL'S ALRIGHT THE TROUBLE IS DEAR, HE EATS ONIONS
—AND NOW I SPEAK —WITH AUTHORITY ON
SAY JOE! I'M GOING TO GET THIS SET TOO. MY BOOTLEGGER IS UNRELIABLE
RIGHT FROM CANADA BOYS
SOME DAY? JUST WAIT. IT'S POSSIBLE
OH! THEIR RADIO WON'T WORK. I WAS AFRAID OF THAT
YES! NOW THEY ARE COMPLETELY THROWN ON THEIR OWN
!!?!
THAT'S MRS JONES SPEAKING I HARDLY RECONIZED HER VOICE
THE JONESES JUST RETURNED FROM ABROAD. THEY SPENT A WEEKEND AT LORD ONLYNO'S MANOR

Potter Rug Aerial

The Ultra-Convenient Super-Sensitive Antenna

For All Receivers

Don't lose the profit from set sales by installing outside aerials.

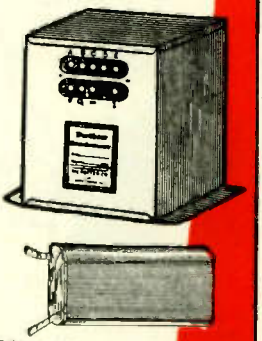
Make an extra profit from the sale of a Potter Rug Aerial and save the installation expense. Slips under a rug. No tools, nails, or lead-in necessary.

Selectivity of midget sets improved when the short, sensitive Potter Rug Aerial is used.

List Price, complete with Potter Ground Clamp..$1.70

Potter Replacement Condensers and Cartridges

Replacement condensers and cartridges are quickly available through the *Potter Replacement Condenser Service.* By-pass and filter blocks carried in stock for standard sets. Special units can be duplicated in less than 48 hours. Order from Potter or your jobber.



Wall Chart Makes Selection Easy

It's easy to order condensers with the Potter Chart. Look up the make and model receiver for which a replacement is needed. All necessary data for selection of the right unit and its list price are given.

Mail Coupon for FREE Chart

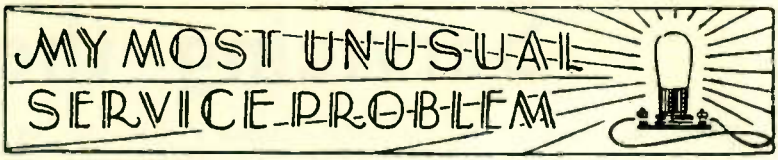
To Potter Co., 1948 Sheridan Road, North Chicago, Ill.

Please send **POTTER REPLACEMENT WALL CHART** and a folder describing the **POTTER RUG AERIAL.**

Name .....

Address .....

To answer an advertisement, tear out page and pin to letterhead



Radio Sales and Service will pay $2.00 for each unusual service problem printed—mail them in

Simple Hum Remedy

I was called out on a job where the owner of a certain radio set had been troubled with an objectionable AC hum. I removed the chassis and took it into the shop for a thorough examination, thinking that the filament center tapped resistor or a cathode resistor was defective. After a very thorough test I found nothing wrong and proceded to connect up the set. To my surprise it played very well with only a very faint hum.

Taking nothing for granted and still being puzzled, I took the set to the local factory service and again had the chassis checked and they pronounced it OK. Now I was baffled—but after a very careful analysis of conditions I came to the conclusion that the trouble must be local; that is, the hum must be coming through the 110 volt circuit. I proceeded to hook one terminal of two .01 Mfd. condensers to each side of the 110 feed wires and ground the remaining two terminals to the chassis. This completely eliminated the objectionable hum.

In later service work I have found a number of sets for which this is a sure fire remedy in cases where the hum increases when the set is in resonance with a station.

H. F. Hodder,
Radio Service Eng.,
Seven Mile Radio Shop

Slipping Belt Causes Static

I was called upon to service an electric radio which made unusual popping and cracking sounds. After testing all connections and making a thorough examination of the radio, I came to the conclusion that it was some form of interference that was causing the trouble.

The lady of the house informed me that the only electric appliance they had was an electric refrigerator. I stopped it and found that the noise in the radio ceased. Then I examined all connections and brushes on the motor and found them to be O.K. Then I slipped the belt off the motor that runs the compressor in the refrigerator and started the motor, which did not cause any interference. I found the belt had been slipping on the pulley wheel of the compressor, making static electricity, therefore causing sparks which made interference in the radio.

Wayne Hook,
408 Granville Ave.,
Muncie, Indiana.

Loose Lighting Connection Causes Troublesome Interference

Recently upon demonstrating a receiver in a home past which street cars are operated, I found the reception to be very noisy when a car passed.

The interference was so severe that I did not have much hope for completing the sale. Car after car passed by, each bringing a shower of crashes which lasted for nearly a minute afterwards.

Then a heavy truck came rumbling down the street, accompanied by the same shower of crackles in the reproducer. This eliminated the street car as the cause, and showed that the trouble was due to a loose contact in some electrical circuit. The aerial and

(Continued on page 57)

Servicing the

Not more difficult than work on the familiar t.r.f. receiver. If you understand the circuit and use the proper test equipment, you will have no trouble adjusting these sensitive receivers.

THIS season has brought a very marked rise in the popularity of the super-heterodyne receivers. Many additional manufacturers have adopted this circuit, and many more no doubt will soon adopt it.

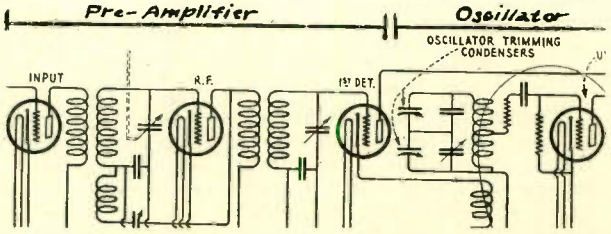
Many servicemen, skilled in the adjustment of the strictly tuned radio frequency receivers, have been called upon to service these new sets. The demand for this type of service work will grow very rapidly in the next few months, bringing almost every serviceman into contact with the supers.

The first reaction to these new sets is that they are both more complicated and more difficult to service. That there are more complications is not to be doubted. However, servicemen who have been working on the supers for years are very outspoken in their belief that the super-heterodyne is no more difficult to adjust than is the t.r.f. receiver.

Good Equipment Needed

It is almost universally accepted that it is hopeless to attempt to make a thorough adjustment without the use of a test oscillator calibrated both in the broadcast band and in the intermediate frequencies and an output meter.

The circuit of the super-heterodyne is not complicated, as some believe. It may be divided roughly into four parts: (fig. 1), the pre-amplifier, the oscillator, the intermediate amplifier, and the detector amplifier unit. The second and third sections are where the difference exists between the super-heterodyne and the ordinary t.r.f. circuit.



A Typical Super-

Super-Heterodyne

The pre-amplifier, as its name suggests, amplifies the signal picked up by the antenna before it is passed on to the oscillator stage. This section is identical with the radio frequency stages of any tuned radio frequency receiver. This year's supers all employ screen-grid tubes in these stages, and many models use band pass filters to increase selectivity.

The problems of alignment and neutralization of these stages are identical with those found in any t.r.f. receiver.

Function of Oscillator

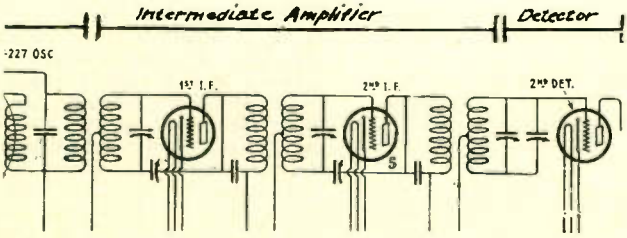
The oscillator stage combines the output signal from the first detector in the pre-amplifier with the signal generated within the oscillator stage. The frequency of the signal generated by the output stage must be at all times of such value that the signal or beat note resulting from its combining with the signal from the pre-amplifier will always be of the same frequency. This frequency is that at which the intermediate amplifier stages are peaked to give the greatest amplification.

The combining of these two signals, the received and the oscillator signal, to form a third or beat note, is called heterodyning. It is exactly what occurs when two broadcasting stations overlap, and a squeal or beat note is produced. The only difference is that the beat note produced in the super-heterodyne receiver is not of audible frequency, ranging from 175 to 185 kc., depending upon the make of the receiver.

If the oscillator stage is not oscillating, the receiver will not operate at all. By touching the grid of the oscillator tube, a click should be heard in the speaker, and a second one when the contact is removed. This signifies the oscillator is functioning.

Distorted reception, poor sensitivity at various points on the dial, and reception of the same station at more than one point on the dial, may signify that the oscillator tuning condenser is not correctly aligned. In this case the beat note would not be the same all

(Continued on page 57)



Heterodyne Circuit

Service Contest Won by Kingston, N. Y., Serviceman

W. R. Moser of the Leemon Radio Company, Kingston, New York, won the Dayrad Type R Voltmeter Ohmmeter prize.

Here are my answers to the questions for November contest:

1. The change in plate current made by decreasing the grid voltage.
2. Low resistance voltmeter for "A" and "B" batteries. High resistance voltmeter for power packs.
3. Two by-pass condensers of .5 mfd. in series— .25 mfd. Two 50,000 ohm resistors in series— 100,000 ohms.
4. Turn on the grid dip meter. If it is O. K. the galvanometer reading should be nearly full scale. Take a flexible lead from the meter coupling coil and clip it to the grid end of one of the variable condensers used to tune a R. F. stage in the receiver to be adjusted. (If screen grid tubes are used clip the lead to the screen grid cap on the tube.) The receiver does not have to be in operation but a tube must be in the socket of the stage under test.

   Set the main tuning dial of the receiver at about the middle of the broadcast band or at the setting recommended by the manufacturer for realignment purposes. Now turn the grid dip meter dial until a minimum galvanometer reading is obtained. This low reading indicates resonance. Without disturbing the receiver dial move the clip from the meter to the grid end of the next condenser unit in the gang. Should it be necessary to change the grid dip meter dial to obtain the same galvanometer reading as before, the two R. F. stages are out of alignment. It will now be necessary to adjust the balancing or trimmer condenser in one of the stages (sometimes the antenna stage has no balancing condenser) in order to get the same galvanometer "dip" in both circuits without changing the receiver or meter dials. Succeeding stages are adjusted in the same manner, using one R. F. stage as the standard. When the gang is aligned it is good practice to check the work at a high and low frequency using the grid dip meter to adjust any small differences that may occur by bending the rotor plates.
5. Full-wave rectifying packs rectify both halves of the cycle, half-wave rectifying packs rectify only one-half of the cycle.
6. The I. F. amplifier is out of adjustment. If manufacturer's directions and a high frequency oscillator are not available, break the plate circuit of the second detector and insert a milliameter. Tune in a signal and adjust each I. F. stage for highest reading on milliameter. Receiver will then be found to be in good working order.

"Unmatched Units" Winning Cover Title

The first prize of $25.00 was won by Cecil B. Hughes of Kent, Ohio, with the title: "Unmatched Units."

The following ten persons were awarded $1.00 each for their title:

"A Radio Rooter Rooted"
B. L. Sellers, Monmouth, Ore.

"Grid Suspension"
A. H. Schoppelrey, Lorain, Ohio

"The Disgusted Radio Widow"
P. J. Kuprion, Louisville, Ky.

"Tuned Out"
H. B. Kitzenberger, St. Joseph, Mo.

"Radio Trouble"
J. I. Day, Corning, N. Y.

"Tone Control vs. Self Control"
Mrs. B. W. Graper, Mayville, N. Y.

"High Tension Moments"
M. L. Swanson, Hettinger, N. D.

"Volume Overcoming Interference"
Roy A. Ellis, Oklahoma City, Okla.

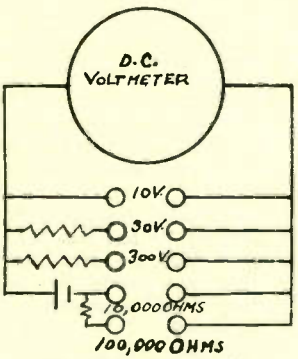
"Man Made Interference"
Wm. P. Walker, Burlington, Vt.

"She Needs a Midget"
J. R. Kleinfeldt, Jacksonville, Fla.

Set Checking with the Volt-Ohmmeter

RADIO servicing is constantly becoming more complicated and as a result demands more of those engaged in it. The greatest aid in meeting these changed conditions is properly designed test equipment.

The serviceman finds he no longer can locate trouble in radio receivers by making a few simple tests. Instead, a means for actually measuring the invisible but important circuit conditions must be available.



The Simplified Circuit

The Volt-Ohmmeter Measures D. C. Potential and Resistance

The simplest and least expensive piece of equipment permitting a fairly thorough test of a receiver is the volt-ohmmeter. The instrument is built about a single meter of the type described in the October issue of RADIO SALES AND SERVICE. Series resistances in conjunction with a switching device allow measurement of D. C. voltage over the full range of values found in radio receivers.

To measure resistance, a small flashlight cell is placed in series with the meter. A scale is then calibrated in ohms, enabling resistance values to be read directly without calculations. A compensator is placed in the circuit to correct for change in battery voltage, which would otherwise affect the accuracy of the measurements.

Instrument Ranges Vary

There is considerable variation in the number and extent of the ranges for measurement of both resistance and voltage that are provided on the different instruments of this type. However, all instruments measure potential up to 600 volts and resistance to 100,000 ohms.

Selection of ranges is accomplished by means of push buttons, pin-jacks, or multiple binding posts, depending on the make of the particular instrument. Most instruments are furnished with test leads and picks for convenience in making tests. Calibration of the instruments is then made with the leads in circuit, eliminating any error due to the resistance of the leads.

Permits Location of Ordinary Set Troubles

Set checking with a volt-ohmmeter is not as rapid as when a

set analyzer is used, but discloses the source of most ordinary cases of trouble. The volt-ohmmeter is, however, a less costly instrument than the set analyzer, and for this reason may be more desirable to many servicemen.

The first set in testing a receiver with the volt-ohmmeter is to check plate, grid, cathode, and shield-grid voltages throughout the receiver. This is done while the set is turned on and with all tubes except the rectifier removed

Table of Resistance Values

Unit	Usual Value in Ohms
Primary of A. F. Transformer	2000
Secondary of A. F. Transformer	5000
Grid Resistor of Resistance Coupled Amp.	100,000 to 1 megohm
Plate Resistor of Resistance Coupled Amp.	50,000 to 500,000
R. F. Choke	50 to 500
R. F. Transformer, Pri. or Sec.	Negligible

from their sockets. Place one test pick in the filament opening of a tube socket and measure the voltage to all other contacts of that socket and to the clip for the top of shield-grid tubes. These readings of plate, grid, cathode, and shield-grid voltages should closely follow those recommended by the manufacturer. This data may be had from the sheets accompanying each tube.

Does Not Measure A. C. Filament Voltages

Filament voltages of A. C. sets will read zero on this D. C. meter. Test these circuits with the receiver turned off, using the ohmmeter. The resistance between filament contacts in each socket should be practically zero if the circuit is in the proper condition.

When an incorrect voltage is encountered, it is a sure indication of trouble at some point in the circuit. Turn the receiver off and test the resistance of the circuit in question. The resistance to expect in any circuit may be roughly figured by considering each component between the points where the test prods are applied to have the resistance assigned to a like part in table 1. By adding the resistance of the various parts that are in series, a rough idea of resistance value of the circuit may be secured.

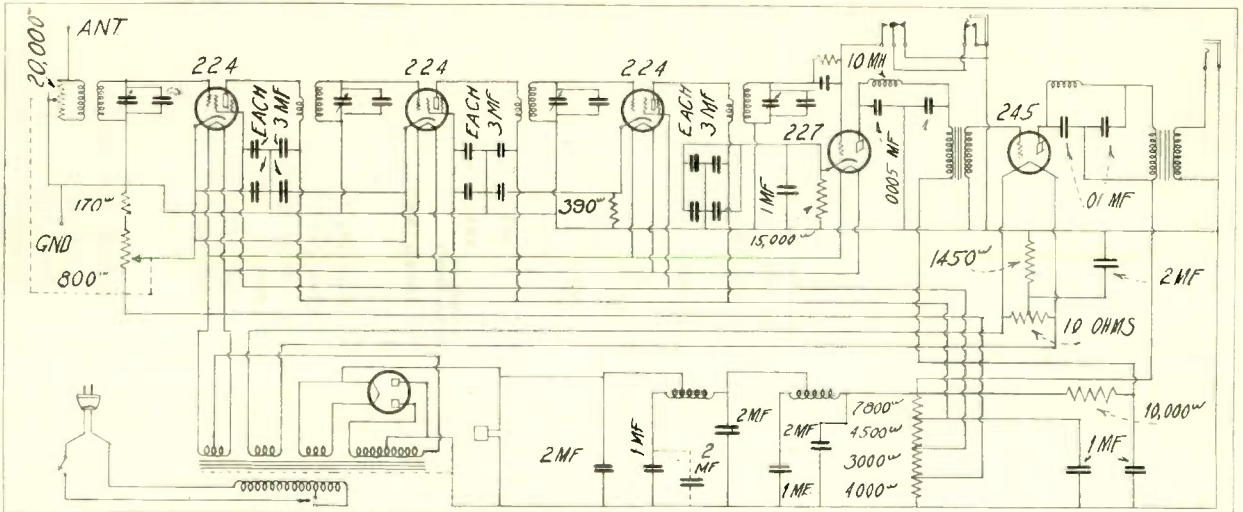
Not Necessary to Know Exact Circuit Resistance

For instance, take a detector plate circuit having for its constituents an audio frequency transformer primary (2000 ohms), an r. f. choke (20 ohms), and connecting wiring that should have negligible resistance. The calculated resistance of this circuit would be 2020 ohms. Variation in design of the units might vary this figure from 1000 ohms. Any reading outside these limits would be a sign that there is some fault in the circuit between the two test prods. By checking separately the resistance value of each unit in the circuit, the defective unit or the fault of the wiring can be located.

Many Failures Cause Large Change in Circuit Resistance

Fortunately the average run of service failures cause a radical

(Continued on page 63)



TUBE NO IN ORDER	TYPE OF TUBE	POSITION OF TUBE DET ETC	READINGS, PLUG IN SOCKET OF SET									
			TUBE OUT		TUBE IN TESTER							
			A VOLTS	B VOLTS	A VOLTS	B VOLTS	G VOLTS CONTROL GRID	CATHODE HEATER VOLTS	NORMAL PLATE MA	PLATE MA GRID TEST	PLATE CHANGE MA	SCREEN GRID VOLTS
1	224	1st RF	2 45	140	2 24	136	35	35	15	4	25	55
2	224	2nd RF	2 45	140	2 24	136	35	35	15	4	25	55
3	224	3rd RF	2 45	140	2 24	136	35	35	15	4	25	55
4	227	Detec	2 45	278	2 24	248	3	3	18	-	-	-
5	245	Amp	2 45	355	2 24	238	35	-	30	32	2	-

RADIO SALES AND SERVICE

SERVICEMEN'S DATA SHEETS

STROMBERG-CARLSON Models 641-642

Line voltage 114 Vol. Control Full On

9-21-30

Servicing the Super

(Continued from page 51)

over the dial. This is remedied by adjustment of the two trimmer condensers, one being in series and the other in parallel with the main condenser.

Oscillator Adjustment

The adjustment is made in the following manner: *Couple the output of a test oscillator, adjusted to about 1400 kc., to the antenna lead of the receiver. Tune the receiver till a maximum deflection is reached on a output meter in the output circuit of the receiver. Then adjust the series trimmer for maximum deflection of the output meter. Change the frequency of the oscillator to about 600 kc. Adjust the parallel trimmer as before. Again set the oscillator to about 1400 and reset the series trimmer for maximum deflection. This will give a beat note of uniform frequency across the whole dial.*

The beat note or heterodyne signal from the oscillator is fed into a series of untuned radio frequency amplifier stages. Each transformer is peaked with a small trimmer condenser to give maximum amplification at the frequency of the beat note.

Adjustment of the peaking or intermediate frequency transformers is often necessary in order to get the best sensitivity. A test oscillator, adjusted to a frequency equal to that of the oscillator beat note, should be connected to the grid lead of the first detector, the tube preceding the oscillator. With the output meter in the circuit as before, each intermediate transformer trimmer should be adjusted for a maximum deflection.

Often there is provision for the neutralization of the intermediate stages. This is done with a dummy tube in the manner known so well by every radio serviceman.

Audio frequency troubles, power pack troubles, poor wiring, loose socket contacts — all the myriad troubles that a serviceman has to ferret out—will be present, and the usual methods of trouble shooting will serve to locate them.

Where the design of the trimmer condenser will permit it to short, this will prove a fertile source of exasperating troubles.

Unusual Service Problem

(Continued from page 49)

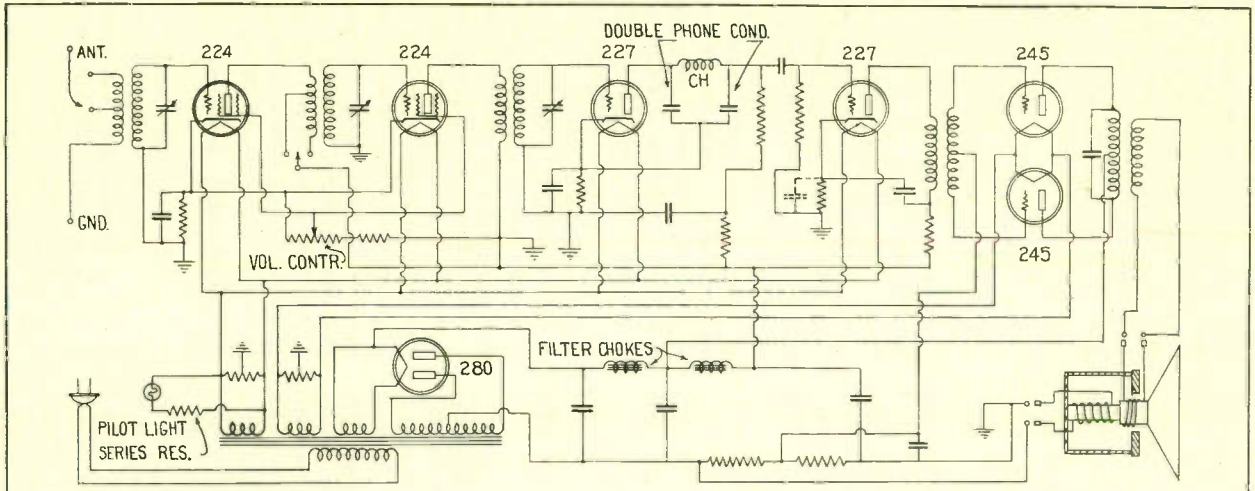
ground connections were inspected and found O.K., leaving the traction power lines or the house lighting circuits as the probable seat of the disturbance.

Talking with the customer about the annoyance of the street cars and trucks, she made the statement, "Why, I believe they will shake our house down some day. The bigger trucks sometimes even make that chandelier above you blink off and on."

That was enough. Reaching up I gave the light a push and the fire-works in the radio began again, better than ever. Investigation showed that even though the loose connection at the base did not make the lights blink visibly, it was a first rate source of radio interference.

A few minutes work with a soldering iron really completed the sale of a radio. Several other deal-dealers had demonstrated at this prospect's home, but did not try to close the sale due to the bad interference.

F. E. Williamson, Chicago



TUBE NO. IN ORDER	TYPE OF TUBE	POSITION OF TUBE DET. ETC.	READINGS PLUG IN SOCKET OF SET										
			TUBE OUT		TUBE IN TESTER								
			A VOLTS	B VOLTS	A VOLTS	B VOLTS	C VOLTS CONTROL GRID	CATHODE HEATER VOLTS	NORMAL PLATE M.A.	PLATE M.A. GRID TEST	PLATE CHANGE M.A.	SCREEN GRID VOLTS
1	224	1st R.F.	2.15	152	2.1	140	3	3	2.6	5.6	3	76
2	224	2nd R.F.	2.15	152	2.1	140	3	3	2.6	5.6	3	76
3	227	DET.	2.15	84	2.1	82	14	14	1	-	-	-
4	227	1st A.F.	2.15	140	2.1	80	3	3	2.1	3	.8	-
5	245	2nd A.F.	2.4	228	2.45	208	38	-	22	26	4	-
6	245	2nd A.F.	2.4	228	2.45	208	38	-	22	26	4	-
7	280	Rect.	4.3	-	4.1	-	-	-	64	-	-	-

RADIO SALES AND SERVICE

SERVICEMEN'S DATA SHEETS

ATWATER-KENT MODEL 55

Line Voltage 106 Vol. Control At Full Cn

C.B.

Service Means Cash

(Continued from page 19)

men not inclined to be over-"conscientious" when it comes to replacing tubes.

Although each Martin serviceman earns a commission on all materials sold, he is likely to carry his regard for the customer's pocketbook to the extreme, whereas he and the firm and the customer would be better off if he would give his salesmanship more rein. Suppose he is called to a set and finds one tube burned out. Of course, he replaces that tube readily enough, but so long as the other tubes seem to be functioning in some fashion he leaves them in the set, although they are probably on their last legs of usefulness and may cause trouble the very next day.

Over-"conscientiousness" developed to such extremity is more a vice than a virtue, even if it does recommend the fundamental honesty of the Martin service staff. Many other good servicemen have the same failing. Other dealers have noticed it. Mr. York believes that where one tube has burned out it is a fairly sure sign that the other tubes are about gone, too, and that it is a disservice rather than a service to the customer to neglect replacing them at once.

Nevertheless, over the year, a steady flow of tube business is maintained by the Martin organization, despite the fact that Mr. York sees plenty of room for tube sales improvement. One curse of the trade, he believes, is that cus-

(Continued on page 61)

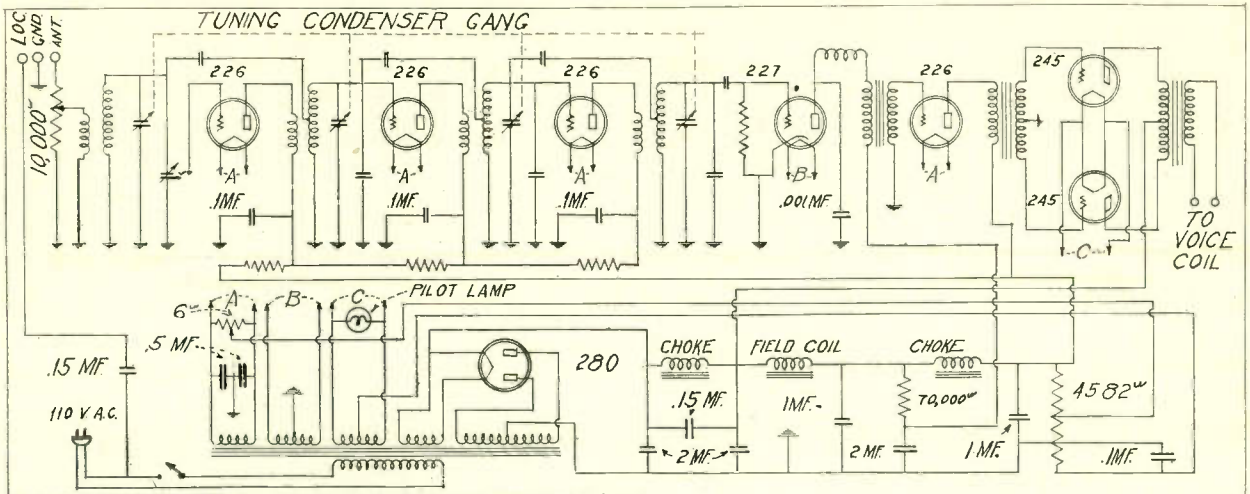
Interpreting Set Analyzers

(Continued from page 45)

windings and since this resistance is higher than that of R_2, enough grid bias will be indicated to drive the needle off the scale. If a test indicates no grid bias, and plate voltage is normal, look for an open circuit in the secondary of the R.F. coil or its associated wiring. A test indicating no grid bias and with plate voltage high and an abnormal amount of plate current, would point to trouble in the cathode circuit. Condenser C_5 may be shorted or the cathode between resistor R_2 and the tube contact may be grounded.

In those circuits which use the screen-grid type of tube as a detector, the tests are the same as those outlined above, except that there is one more test to be made —that of screen-voltage. This voltage is supplied directly from the voltage-divider, and in some cases a resistor is connected in series with it to reduce the voltage. The screen is also by-passed to the cathode circuit by means of a small condenser. Failure of screen voltage may therefore be caused by either an opening of the resistor or a short in the by-pass condenser.

In a great many of the modern circuits, especially the kind using 224's as detectors, resistance coupling is used to couple the detector to the audio stage. The connections of the plate resistor are made in the same manner as the primary of the audio transformer, so the tests would be the same.



TUBE NO. IN ORDER	TYPE OF TUBE	POSITION OF TUBE DET. ETC.	READINGS PLUG IN SOCKET OF SET — TUBE OUT: A VOLTS	TUBE OUT: B VOLTS	TUBE IN TESTER: A VOLTS	TUBE IN TESTER: B VOLTS	TUBE IN TESTER: C VOLTS CONTROL GRID	TUBE IN TESTER: CATHODE HEATER VOLTS	TUBE IN TESTER: NORMAL PLATE M.A.	TUBE IN TESTER: PLATE M.A. GRID TEST	TUBE IN TESTER: PLATE CHANGE M.A.
1	226	1st R.F.	1.3	80	1.2	75	4.8	-	3	5	2
2	226	2nd R.F.	1.3	80	1.2	75	4.8	-	3	5	2
3	226	3rd R.F.	1.3	80	1.2	75	4.8	-	3	5	2
4	227	DET.	2.3	80	2.1	26	-	-	1.0	-	-
5	226	1st A.	1.3	80	1.2	70	3.	-	2.6	6.5	3.9
6	245	2nd A.	2.3	240	2.2	196	34	-	30	34.	6
7	245	2nd A.	2.3	240	2.2	196	34	-	30	34	6
8	280	RECT	5.	-	4.7	-	-	-	100	-	-

RADIO SALES AND SERVICE

SERVICEMEN'S DATA SHEETS

PHILCO Model 87

Line Voltage 108 Vol. Control At Full On

SEPT. 20, 1930 HAL BURNETT

tomers so often replace their worn-out tubes with tubes they see on sale at bargain prices.

How about mantel-size radios, the so-called midgets? There are thousands of small apartments on Chicago's north side, affording a big market for little sets. Mr. York and the other Martin men would like to sell the larger models, of course. He says: "The midgets are here; if we didn't sell them somebody else would; so we sell them—or rather, give them a fair chance to sell themselves."

For each inside installation the Martin Company charges $2.50. The tubes are guaranteed for ninety days and service is given free for the same period. A carrying charge of ten per cent is invariably made at the outset of each time transaction. Such installation and carrying charges definitely recorded in every contract make a comfortable difference in the profit when final payment has been made—and in the total money volume at the end of the year. Care is taken on credits, of course; if a would-be buyer does not come through the initial credit examination with a good mark, his business is turned down.

No Home Demos

(Continued from page 17)

he can afford a better job, finds one in the Ristow stock, and orders it out. Exactly five out of every hundred sales made this year have turned out just that way—the buyer returning the set originally bought within three days after its purchase and substituting a better set.

There's Money in Tubes

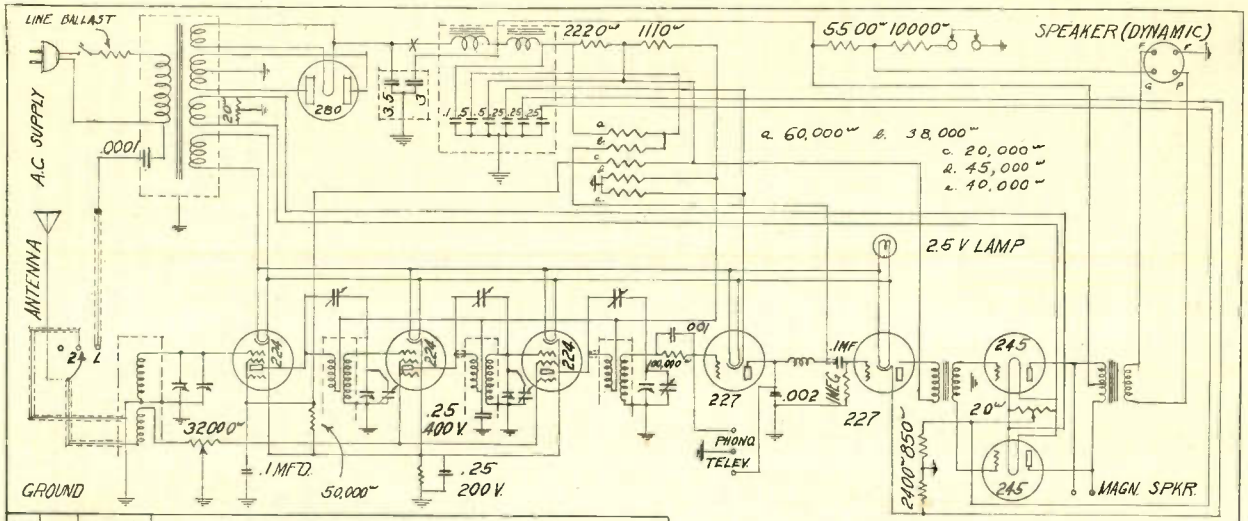
(Continued from page 14)

to make sure he is an ambassador of good will, and not a detriment to you and your future business.

"The dealer's real job starts after the sale is made. If he wants to obtain further business from that customer and have that customer recommend the store to his friends, it is necessary to do everything possible to keep the set in perfect operating condition. That is where the opportunity for tube sales is doubly apparent. The majority of my service calls—in fact about 60 per cent—are due to tube troubles. I find it increases customer satisfaction to anticipate their tube troubles and replace the tubes before they give trouble. Nothing is more discouraging than to have a tube burn out in the middle of some program that is being listened to.

"As people are more and more convinced it is economy to keep spare tubes on hand to prevent any loss of service of the radio set, I am convinced the sale of complete renewal kits will be the usual and ordinary thing. It will not be done at once but the more the importance of checking the tubes is driven home, the sooner that day will arrive.

"There is money to be made in the tube business all the year 'round, but it will only be made by those dealers who remind their customers to buy, and who constantly keep tubes on display. Good tubes in the set mean good service from the set and that is what, in the final analysis, counts most."



TUBE NO. IN ORDER ①	TYPE OF TUBE ③	POSITION OF TUBE. 1ST R.F. ETC. ④	READINGS, PLUG IN SOCKET OF SET — TUBE OUT A VOLTS ⑤	TUBE OUT B VOLTS ⑥	TUBE IN TESTER A VOLTS ⑤	TUBE IN TESTER B VOLTS ⑦	TUBE IN TESTER C VOLTS ⑧	CATHODE - HEATER VOLTS ⑨	NORMAL PLATE M.A. ⑩	PLATE M.A. GRID TEST ⑪	PLATE CHANGE M.A. ⑫	SCREEN GRID VOLTS ⑬
1	224	1st R.F.	—	—	2.2	166	2	2	3.9	9	6.1	74
2	224	2nd R.F.	—	—	2.2	166	2	2	3.9	9	6.1	74
3	224	3rd R.F.	—	—	2.2	166	2	2	3.9	9	6.1	74
4	227	Detec.	—	—	2.3	188	18.5	18.5	6.	—	—	—
5	227	1st A.F.	—	—	2.3	182	13.5	13.5	5.8	6.8	1	—
6	245	2nd A.F.	—	—	2.3	260	46	—	24.	28	4	—
7	245	2nd A.F.	—	—	2.3	260	46	—	24.	28	4	—
8	280	Rect.	—	—	4.7	—	—	—	90.	—	—	—

RADIO SALES AND SERVICE

SERVICEMEN'S DATA SHEETS

STEWART-WARNER MODEL 950

Line Voltage 115 Vol. Control At Max Pos

3-13-30 HAL BENNETT

(Continued from page 55)

change in the resistance of a circuit. Thus the exact resistance of a circuit is not necessary if a quick check is to be made.

An open circuit shows on the ohmmeter scale as infinite resistance, or no deflection of the needle. A short circuit causes the meter needle to deflect to an extreme position. A shorted or broken-down condenser unit will give the same deflection as a short circuit.

Check Those Tubes!

(Continued from page 21)

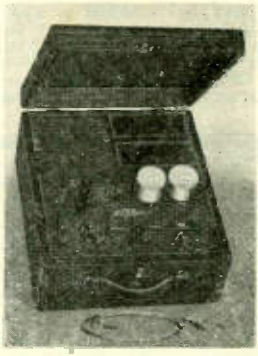
performances of the better grades of tubes now on the market. These curves are not plotted to a standard scale, but represent deterioration throughout life. You will note there is considerable variation between the individual curves. This variation is proportional to that which may be expected from the tubes in a radio set. You will also note that none of these characteristic deterioration curves shows failure before one thousand hours, yet it is evident that if the best results are to be obtained from the radio set these tubes should be changed after about one thousand hours of actual operation.

New Products

(Continued from page 41)

Jewell Portable Oscillator

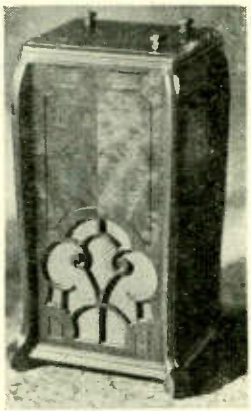
The Jewell Electrical Instrument Company, 1642-P Walnut St., Chicago, have added to their line of radio service instruments, a portable test oscillator for checking t. r. f. and superheterodyne receivers. Being driven by self-contained batteries, power line connections are avoided and very complete shielding is achieved. It covers the broadcast band of 550 to 1500 k. c., the intermediate band from 120 to 200 k. c. and is calibrated for 130 and 175 k. c. for super-heterodyne test. Two 30-type tubes in series for



battery economy, one frequency selector, and complete signal control from zero to maximum, are other unusual features of the Pattern 560 Oscillator. It is furnished in a carrying case with calibration chart, wiring diagram, and instructions.—*December Radio Sales and Service*

Sentinel Portrola

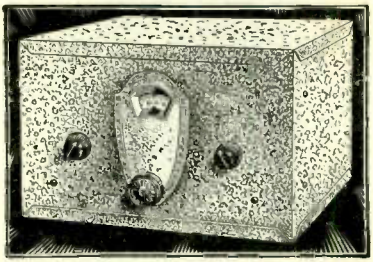
The Sentinel Super Heterodyne Chassis is now available in a very unique cabinet form. The Portrola Model has a small, easily moved cabi-



net. May be placed by the davenport, bridge table or wherever the listener wishes. Three 224's, two 227's, two 245's and one 280 tubes are used in this powerful but selective chassis.—*December Radio Sales and Service.*

Silver-Marshall Short Wave Converter

A compact and self contained unit that may be attached to any broadcast receiver to convert it for short wave reception is manufactured by Silver-Marshall, Inc., 6401 West 65th St., Chicago, Ill. The short wave converter is tuned by a single dial

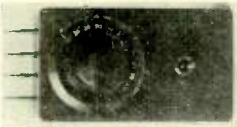


and an auxiliary midget condenser for extreme accuracy of control. Operation is greatly simplified by the absence of any regenerative control. To hook up this unit, one merely needs to remove the antenna lead from the broadcast receiver and connect to the antenna post of the converter; then run two leads from the converter to the antenna and ground posts of the antenna set. Four pairs of coils enable the Silver-Marshall Short Wave Converter to cover the wave length range from 18 to 206 meters. Available in models for either A.C. or battery operation. *December Radio Sales and Service.*

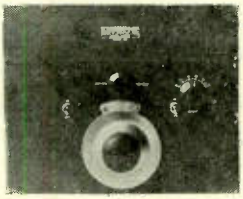
Supreme Oscillators

To meet the need for satisfactory oscillators in the service field the

Supreme Instruments Corporation of Greenwood, Mississippi, has developed three units: one, an attachment to permit the Diagnometer oscillator to cover the intermediate bands; second,



a thoroughly reliable oscillator at a moderate price; and third, a modulated radio frequency attenuated os-



cillator of the very highest type.—*December Radio Sales and Service.*

National Thrill Box

A short wave receiver of exceptional merit is manufactured by the National Company, Inc., 61 Sherman St., Malden, Massachusetts. This unit employs five tubes including two screen grids and three '227's. Provision is made for the use of a pentode tube in the radio frequency stage. The National Thrill Box Short Wave Receiver is available in both battery and A. C. models. The set is thoroughly shielded and furnished in an attractive metal cabinet. Four power R.F. transformers are furnished to cover the range from 15 to 115 meters. The power pack is in a separate unit in order to avoid any possible hum resulting from its location inside the tuning cabinet. *December Radio Sales and Service.*

CORRECTION

The Hickok Electrical Instrument Company wishes to announce the price to dealers of their SG 4600 Radio Set Tester is $90.00 and not $140.00, the list price as given in the October issue.

This section is maintained as a news service to dealers, without advertising consideration of any kind. Manufacturers are invited to submit cuts and descriptions covering new products.

Sell the Complete Belden Line « Make the Extra Profit

Belden Shielded Lead-in « The Key to Improved Radio Reception

Belden Radio Accessories

have a World Wide Reputation for Quality

Belden Aerial Wire

Belden Lead-in Strip

Belden Easy-Strip Lead-in Wire

There's a good, clean profit in the sale of Belden accessories! Outdoor or indoor aerial kits, shielded lead-in and ground wire—portable outlets that lie flat under-the-rug—these and a dozen other items in the Belden line are priced to make attractive profits.

Belden quality protects you against the failures and complaints of trashy accessories. Still Belden retail prices are surprisingly low—so low, in fact, that you cannot afford to risk your reputation on unknown accessories that always pile up trouble for you.

Mail the coupon for new Bulletin on the Complete Belden Line of Radio Accessories. Write today.

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Belden Indoor Aerial

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Please send us new Bulletin on the Complete Belden Radio Line.

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.....

Have You the Test Equipment to Reap the Profits *from these newspaper campaigns?*

Jewell Pattern 209 Tube Checker has six tube sockets. It checks all types of tubes including screen grid, rectifier and the new two-volt D. C. type. No batteries are needed. List price $30. **Dealer's price $22.50**

Jewell Pattern 210 Tube Checker gives direct reading on all tubes from UX-199 to UX-250 —no mental arithmetic necessary—operates from A. C. lines and compensates for variations between 100 and 130 volts. List price $65. **Dealer's price $48.75**

"Go to your dealer and have him test your tubes for vigor and vitality."

This is the keynote of big advertising campaigns now run by tube manufacturers in newspapers everywhere. Radio set owners are urged to go to you for frequent tube tests.

Are you equipped to give prompt and intelligent service to your customers? Can you convince them that they should buy new tubes?

Reap the profits of these newspaper co-operative campaigns by getting a Jewell Tube Checker at once. Radio tube replacements, like spark plugs, are made every day of the year. Good tube checking equipment quickly pays for itself. The Jewell Easy Payment Plan will bring your tube checker with a small down payment. Mail the coupon for descriptive bulletin.

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Investigate the

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Don't delay equipping yourself for profitable radio service until you can pay cash. Take advantage of the Jewell Easy Payment Plan extended to servicemen who are alive to the profit-making possibilities of Jewell Service Instruments and who want to pay for them out of service profits. Mail the coupon.

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Please send illustrated literature on Jewell Tube Checkers and Set Analyzers. Also explain the Jewell Easy Payment Plan.

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