

Radio Digest

EVERY WEEK

Illustrated

TEN CENTS

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Vol. VII

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SATURDAY, NOVEMBER 24, 1923

No. 7

RADIO COLLECTS TAXES



DRAFT OF FEDERAL RADIO QUIZ READY

Report to Go before Congress When It Convenes Early in December

WASHINGTON, D. C.—It is reported that the preliminary draft of the Radio trust investigation carried on by the Federal Trade Commission, will be laid before the commission in a few days. The field and all preliminary work has been completed and it only remains for the commissioners themselves to pass on the report. While officials of the commission refuse to discuss the investigation at present, it is understood that the findings will be submitted to Congress in December.

"Aggies" of New Mexico Are Given New Station

STATE COLLEGE, N. M.—Through the efforts of Dean Goddard, the New Mexico College of Agriculture and Mechanic Arts has been presented with a new Radio station. The gift will include the equipment for constructing a 100-watt transmitter and the building to house it. The station will be utilized for experimental purposes and amateur relay work under the call 5XD. It will be separate and entirely distinct from the present studio and equipment which will be used solely for broadcasting service under its present call, KOE.

AIRPHONE TALKS GET DELINQUENT EXCISES

Cities Find Dilatory Taxpayers Heed Broadcast Warnings and Pay Up—Method Saves Much Money

CHICAGO.—Of all the uses to which Radio, the eternal, universal element, has been put none is so close to the people, to their purses, as that to which the authorities of Cook County, of which county Chicago is the seat, recently applied it. And by the same token no use is likely to be so unpopular. For in Cook and in several other counties throughout the United States, Radio is used as a tax collector.

There are about 3,500,000 persons resident in Cook County. Most of them live in Chicago. The taxpayers of the county number about 2,000,000. They paid last year almost \$150,000,000. Fifteen per cent of the taxpayers were delinquent.

(Turn to page 2)

B'ARS AND WOLVES GET EAR OF JAZZ

BANGOR, ME.—It is reported that most hunting parties entering the Maine woods this fall for big game are equipped with receiving sets. Results obtained have been startling to some of the inhabitants who have experienced the sensation of hearing jazz and other forms of entertainment in the forest wilds for the first time.

Helen Eley, left, of the "Batling Butler" cast, now playing in New York, and recently broadcast from one of the large eastern stations. Jane Richardson, right, of the "Gingham Girl" cast, now playing in Chicago, and recently broadcast from Station WMAQ, the Chicago Daily News



"Straight-from-the-Pulpit" Sermons Radioed by WBZ

SPRINGFIELD, MASS.—Church services direct from the church have been inaugurated by Westinghouse Station WBZ here, and will continue throughout the present season. The Rev. James Gordon Gilkey is pastor of the South Congregational Church of this city, which church has been wired direct to WBZ, located three miles distant.

\$40,000 STATION IS ROTARIANS' DREAM

GRAND RAPIDS, MICH.—The Rotary Club of this city is planning to establish a high-power broadcasting station for entertainment purposes. A joint committee has found it would cost \$40,000 to install and operate for two years a station such as is desired. Offers to house the station have been made by several hotels and a church.

WJZ Fans "Strong" for Visiting British Prince

Author Gives Views of Royal Edward as Rancher

NEW YORK.—America, the most democratic country in the world, must have a weakness for royalty, if the results of a recent talk from Station WJZ are taken as an indication. William H. Crawford, a journalist well known to WJZ audiences for his informal talks about great men he has met, gave a talk about "Ranching with the Prince" on a recent Sunday wherein he described the Prince of Wales as he saw him during a month's visit at the Prince's ranch in Canada. Mr. Crawford, wishing to determine how popular the royal Edward is in this country, offered to send an autographed snapshot of him to anybody who would write him in care of Station WJZ and enclose a stamped envelope for return. In three days over a thousand democratic Americans replied, all asking for the autographed photo.

COLD WEATHER ENDS OFFER TO READERS

NUMBER 26 IS LAST COUPON TO APPEAR

Readers Must Send Letters with Orders to Radio Digest Office by December 1

SPECIAL REWARD OFFER

Coupon Number 26

This Special Reward Coupon is the last to appear in Radio Digest. When sent in, accompanied by necessary remittance, according to the rules governing same, apparatus can be secured. See rules of offer below.

Save Me—I Am Valuable

The Special Reward Offer is discontinued for the present season with the publication of Coupon Number 26 this issue. This action has been deemed necessary as a result of the increased rush in business coming with the colder (and more favorable for Radio) weather.

All Radiophans contemplating taking advantage of the special offer must do so before December 1. All letters containing coupons and remittances for parts must reach the office of Radio Digest on or before that date. Such letters arriving after December 1 will be returned to the writer.

Lack of space requires the omission of the list of Radio parts obtainable. See issue of October 27 or November 3 for this list. One change, however, is to be noted. Articles in Class H must be accompanied by sixteen consecutively numbered coupons and \$3.40, instead of \$3.00 as given previously in the list.

Readers contemplating taking advantage of the special offer must remember that the coupons turned in for any item must be numbered consecutively, as for example, 16, 17, 18 and 19, or 18, 19, 20, 21, 22 and 23. The number of coupons necessary and the cash remittance, of course, depend on the item sought by the reader. There is no limit to the number of series turned in by any one reader.

Another point to be remembered by readers taking advantage of the offer is that checks and money orders will be accepted, but no cash or postage stamps.

3 Stations Win Honor in "Mileage" Contest

KPO, KDKA, and CFCN Latest Aspirants to "DX" Crowns

CHICAGO.—The record's the thing, if recent reports from several broadcasting stations are to be taken as an indication. KPO, San Francisco, KDKA, E. Pittsburgh, and CFCN, Calgary, Alberta, are the three latest aspirants to "DX" crowns. All three have made very creditable records.

Calgary, Alberta's representative in the "mileage" contest, is W. W. Grant's station, CFCN, whose Sunday night church services were heard in England by H. W. Scase, of Darlington. The services were broadcast from the Grace Presbyterian Church in Calgary. This is believed to be the first acknowledged reception in England of any Canadian or American broadcasting station west of the Rocky Mountains. The distance traveled by CFCN's waves is well over 6,000 miles.

KPO, Hale Brothers, on the west coast, received a letter from Sydney, New South Wales, 6,200 miles across the Pacific Ocean, telling of the clear reception of the station.

Westinghouse's pioneer, KDKA, is receiving lots of letters from England. The last one was from T. E. Hamblett, of Lancaster, who has received KDKA's programs several times. The range covered measures 4,300 miles.

Radio Marks Golden Wedding

SCHENECTADY, N. Y.—The Farmers' Night program of WGY, the General Electric station here, featuring the golden wedding anniversary of Josh Perkins and his wife Samantha, proved quite pat in the case of Mr. and Mrs. Charles H. Rice, of R. D. 2, Waterford, N. Y. Mr. Rice wrote WGY that the program was especially interesting to them for it came on their fiftieth wedding anniversary.

Newark Show Ends

NEWARK, N. J.—Newark's third annual Radio show came recently to a successful conclusion. The exhibition was held at the Robert Treat Hotel.

COLLECT TAXES BY AIR

(Continued from page 1)

Property was sold to pay \$3,500,000 in taxes in arrears.

Because of the large percentage of delinquent taxpayers, because of the expense and confusion attendant on such dereliction, the city administration of Chicago decided to use Radio to relieve the situation.

Tell People When Taxes Are Due

Shortly before the expiration of the legal limit of time in which to pay the current taxes those in charge of Station WBU, owned by the municipality and formerly operated by the department of gas and electricity under the supervision of John T. Miller, commissioner, arranged to broadcast to the people that their taxes were due.

So, during the days and nights prior to the time limit, Station WBU told the taxpayers what they should do as to payment of taxes and where to pay them.

The result, according to the county treasurer's office, was an almost immediate increase in the receipt of tax money. "There is no question," said Jacob Lindhelmer, first assistant to the county treasurer, "that Radio is a great help in the collection of taxes. It is almost certain that it will be soon used generally for that purpose."

Other Cities Meet Same Success

The cities of Detroit, Dallas and New York already have successfully applied Radio to the collection of taxes, it was stated. There is likely to be soon an exchange of views by various county treasurers as to the practicability of Radio as a collector of taxes.

So efficient was Station WBU not only as a tax collector but as a means of informing the taxpayers as to the manner in which their taxes were spent, that it was determined to draw plans for increasing the Radio power of the plant. "Station WBU has been closed for the sea-

son," said Commissioner Miller, "but it may be reopened soon as a Class B station."

There are believed to be 250,000 receiving sets in Chicago. Their owners, hearing the sad news about "taxes due," tell their neighbors, friends and relatives. In that way a large if not the greater part of the population are apprised of their duty.

And thus does Radio emphasize the adage as to the inevitability of death—and taxes.

GIVE SHOW TICKETS IN BOSTON CONTEST

Letters from Fans Tell How "Caroline Was Received"

BOSTON.—A prize contest was run by Station WNAC in connection with its recent broadcast of excerpts from the operetta "Caroline," for listeners in to the program. For the best letters from Radiophans, expressing their opinions of the clearness of the pronunciation and enunciation on the part of the artists in this broadcast, tickets to the opera were given; and for the best letter of analysis of the value to be derived by producers of musical plays in broadcasting selections, a similar prize was given.

The question was asked in this portion of the contest: "Do you stay at home and listen in to the music and thereby become satisfied with what the Radio has given you, or do you become so enthused as a result of the broadcast that you are attracted to the theater to see and hear the play in its entirety?" A third contest was for distance and the five listeners who reported hearing the Caroline broadcast from the greatest distance received signed photographs of J. Harold Murray and Miss Myrtle Schaff, the two stars of the production.

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Looking Ahead

The Four-Circuit Tuner Gives Way before the Triple Circuit Coupler! It's a bear-cat! It beats them all! Never heard of a triple circuit coupler, have you? You think you know what it is? Impossible, as it's a brand new invention of H. J. Marx who uses it in his Super-Triplex Circuit. NEXT WEEK Mr. Marx will tell you how to build this coupler and will unfold a few of its thousand merits to you. All aboard for next week? Let's go!

David Grimes Isn't Worth Missing—so you'd better buy a copy of next issue if for that reason only. The "A" tubes didn't work just right in his Inverse Duplex, so Grimes worked till he located and corrected the trouble. The next article shows the results of his efforts and gives for the FIRST TIME, three new circuits!

Copyrighted Music, the A. S. of C. A. and P., and the Story of the National Broadcaster's Association—Beginning next issue, a serial exposé of the obstacles thrown in the way of but surmounted by the spunky stations who banded together and are now laughing at the "music trust" that threatened to throttle all popular song broadcasting.

Vacuum Tubes Aren't Such a Mystery—providing you study their action from the foundation up. Watch for M. W. Thompson's article on this subject.

That Stapleton Man Wrestled with Miloplex Till He Got RESULTS—Read the Mystery Man's story next issue.

R. D.-105, Next Week, the Green Circuit—M. P. Green's hook-up and it's excellent.

Coming—How to Make a Radio Frequency Transformer—Watch for this.

Newsstands Don't Always Have One Left

WHEN YOU WANT

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BE SURE OF YOUR WEEKLY COPY BY SUBSCRIBING NOW

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Publisher Radio Digest, 123 West Madison St., Chicago, Illinois.

Please find enclosed check M. O. for Five Dollars (Six Foreign) for One Year's Subscription to Radio Digest, Illustrated.

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Address

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

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3/32" THICK	1¢	PER SQ. INCH
1/8" THICK	1 1/2¢	PER SQ. INCH
3/16" THICK	2¢	PER SQ. INCH
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ONE of the nicest things about Morrison Loud Speaker is that you don't have to be an expert to attach and operate it. Anyone can get perfect reproduction from Morrison, there is only one adjustment—from soft to loud merely turn a dial.

Morrison attaches to any phonograph and to most horns — costs \$10.00 complete. Guaranteed absolutely. Send for catalog. Dealers who value their customers' good will are showing nice profits on Morrison Sales—easy to sell and stay sold.

Morrison Laboratories, Inc.
343 Jefferson Ave., East, DETROIT, MICH.

CLAIMS FANS FAIL TO APPLAUD STARS

WARNS OF GRAVE PERIL TO BROADCASTING

Check-Up Shows Letters Praising Work of Artists Steadily Decreasing

Within the last few weeks, a man well known to Radio audiences throughout the country said, "Broadcasting is in a far more precarious condition than the three millions of listeners believe, due merely to one thing: the decrease in written applause mailed to artists after their appearance before the microphone."

"Last year and the year before that the appearance of a well-known artist at any one of the leading stations was a signal for a veritable flood of mail and telephone calls. Today an operatic star whose performance at a theater calls for the S. R. O. sign is fortunate if his Radio appearance draws a score of letters from appreciative Radio fans."

Need Spontaneous Letters

A check-up of this warning brings to light numerous facts that substantiate all the man said. Eventually this decrease in letter applause is certain to react on the quality of programs if it has not already done so. Whether or not there is a way to check the tendency is a problem now being studied by studio managers.

At any rate the simplest solution lies with the listener and his friends. No letter however carefully worded will "get over" with the artist unless it is spontaneous. The right kind of message of appreciation can be written on a postcard, while a full page letter written through a feeling of duty may be vacuous and deadening.

Public Appreciates Only What Costs

The sage who remarked that "the public will not appreciate what it does not pay for" might have been referring directly to the Radio audience. It is probable that a tax on programs would cause features to be considered in their proper light. Too many fans take broadcasting for granted, as if the purchase of a set or the assembly of the parts carried with them the assurance of broadcasting organizations that programs would be continued.

If these fans would only consider for a moment that unless stations can assemble creditable artists the stations will be closed down, they would not be so chary with their applause but would let everyone know from artist to announcer that the efforts of all were sincerely appreciated.

Less public criticism and more private appreciation is the crying need of broadcasting stations and the solution is up to the Radio enthusiasts who enjoy but do not applaud.

SEEK VANISHED GIRLS IN "LOST KIN" PLEAS

Motorist Finds Youngster After Description Is Broadcast

BUFFALO, N. Y.—Several cases have arisen recently in which WGR, station of the Federal Telephone & Telegraph Co., here, has been instrumental in locating lost persons. As a result of this success a systematic arrangement has been made between the Buffalo Enquirer and WGR for regularly broadcasting descriptions of lost persons.

One notable instance of such service on the part of WGR was the case of the description of a lost child being broadcast. A Radiophan who heard the broadcast happened to be driving along the road that evening and saw a child which tallied with the description. The youngster proved to be the lost child. He was a runaway and was restored to his parents.

Most of those for which descriptions are broadcast are girls. It is estimated that at least 200 girls disappear in Buffalo every year and very few are ever heard from again.

CALLS THE KOPS AND NABS THE BURGLAR

DETROIT.—While Kelwin Kearney, 19 years old, of this city, was sending a Radio message to a friend in Richmond, Va., early one morning recently, he discovered a burglar breaking his way into the rear of a store back of his house. He broke off his message and called KOP, the Detroit police station. The burglar was captured before he could leave.

UNCLE SAM'S FLIERS TALK THROUGH HAT

WASHINGTON, D. C.—Air mail pilots flying across the continent will soon be able to "talk through their hats" to their ground stations. A one-man Radiophone transmitter and receiver has been devised which provides the headset under the pilot's helmet and the microphone on his breast. One pilot recently talked with Postmaster-General New while flying over Washington.

SHE SHOULD GET AN EARFUL



No human ears in evidence here—as usual—but we'll bet this captivating young Radiophan, Agnes Leonard, gets an earful. The mammoth telephone receiver, the largest ever made, was displayed at a recent Radio show

France Demands Vessels Have Radius of 150 Miles

PARIS.—The recent French Radio requirements for vessels, extending the minimum range of transmission fifty miles, now also affect all foreign ships touching at French ports. The decree, signed last spring, provides that all vessels of 2,000 gross tons, all ships licensed to carry fifty persons including the crew, and also all craft having as many as

twelve passengers aboard, must be equipped to send and receive Radio messages by day up to 150 nautical miles.

Merchant ships between 500 and 2,000 gross tons, licensed to carry less than fifty persons, or with less than fifteen passengers aboard, must be capable of receiving Radio signals up to 2,800 meters and preserve a watch for emergency calls.

Radio is being charged with the responsibility for a decrease in fiction reading during 1922.

WILSON BREAKS HIS SILENCE BY RADIO

EX-PRESIDENT ADDRESSES "LARGEST AUDIENCE"

Ten Minute Talk on Armistice Day Advocates International Peace

WASHINGTON, D. C.—Breaking his silence of four years, Woodrow Wilson on Armistice Day eve made his first address to the American public through microphones installed in the library of his home here and connected with Stations WCAP of this city, and WEAJ of New York. Strangely enough, the address was heard by the largest audience the former president ever faced, even during the height of his career as leader of American affairs.

His speech, "The Significance of Armistice Day," was greatly appreciated by the million listeners in. His subject could have been handled better by no other man, as he, more than any other single individual, was responsible for the negotiations which brought about the declaration of the termination of the World War on November 11.

Advocates World Peace

Touching upon the present international situation, his speech lasting only a little more than ten minutes, was devoted largely to the subject closest to the ex-president's heart, American participation in the establishment of the peace of the world.

The extraordinary event of the broadcasting of the former president's address, following closely upon the recent dissemination through many stations of David Lloyd George's speeches, is hailed as a tribute to the importance and dignity of the Radio audience.

Mr. Wilson's speech was the first message he has given to the American public since September, 1919.

LISTENERS IN RUN THIS BROADCASTER

Station KFV, Formerly KFIQ, Owned and Operated by Invisible Audience

YAKIMA, WASH.—What is probably the first broadcasting station to be entirely supported and operated by its listeners in can be found in this city, the home of Station KFV. Since last Spring, when the Radio store owning Station KFIQ decided to abandon it, the outfit, a fifty-watt installation, has been operated entirely by the Yakima Valley Radio Broadcasting Association, an organization of listeners in formed for the purpose of keeping KFIQ on the air. KFV became the new call, however, when the change in ownership was made.

The Hotel Commercial of this city donates free studio and operating rooms, as well as the use of their roof for the antenna installation. The station is maintained purely as a community enterprise and service, and is supported by quarterly contributions from the members of the association. A number of business and professional members have volunteered as program directors, and the local Ladies' Musical Club has a standing Radio committee which presents several programs each month. Other musical organizations, business men's clubs, high school clubs and local orchestras also volunteer their services regularly to Station KFV.

Having kept the station on the air for over six months, the success of the enterprise is assured, and the experiment is indeed unique in that the station is operated and financed entirely by its own listeners in.

Yale-Army Game on WEAJ

NEW YORK.—"Bill" McNeary, well-known sport writer, broadcast from WEAJ here a running description of the recent Yale-Army game played at New Haven.

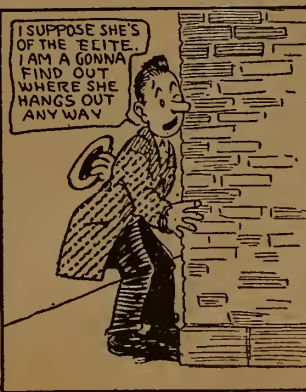
THE ANTENNA BROTHERS

Spir L. and Lew P.

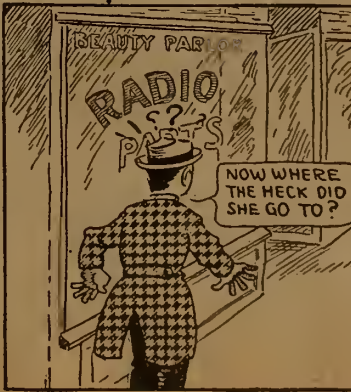
You Never Can Tell



WELL, WOULDNT SHE KEEL YOU OVER THO, NO DOUBT I'LL HAVE TO BE INTRODUCED IN A MORE FORMAL MANNER



I SUPPOSE SHE'S OF THE "ELITE". I AM A GONNA FIND OUT WHERE SHE HANGS OUT ANYWAY



NOW WHERE THE HECK DID SHE GO TO?



WELL ANN, OUR LITTLE SHOP IS DOING GOOD, YOU'D BETTER ORDER SOME MORE RADIO PARTS

EXPOSE OF MUSIC TRUST PRINCIPLES

SONG POPULARIZATION IS AIDED BY RADIO

How Broadcasters Association Is Developing Source of Support for Service

(The following article is one of a series which is being published with the express purpose of explaining to the Radio public the situation existing between the broadcasting stations and the American Society of Composers, Authors and Publishers. The series tells in detail the reasons why the National Association of Broadcasters was organized, and why certain popular songs the copyrights for which are controlled by the "music trust," are not being broadcast.—The Editor.)

PART II

BUT BROADCASTERS believe, for many reasons, that Radio can do all this in a more thorough and expeditious manner. Among these reasons are:

Music sent through the air is listened to by people in remote places as well as in cities. Ordinary song plugging methods do not reach millions of people on the farms, in the villages, or even in small towns.

A repetition of the title before and after the rendition firmly fixes in the listener's mind the name of a musical number, a point frequently missed when hearing a composition sung from the stage or platform, and altogether absent when a melody is played by an orchestra or solo instrumentalist.

When a Radio listener likes a song, he naturally wants to hear it again, and when he wants to hear it, as far as he knows, it may never be broadcast again. This forces him to buy the music, phonograph record or player piano roll. Thus sales are directly linked with broadcasting, the results being surprising.

Form Bureau of Music Release

So the National Association of Broadcasters formed a Bureau of Music Release; employed a staff of experienced music men and invited publishers and song writers to send in their copyrighted music.

This invitation was widely spread through display advertisements placed in theatrical and musical papers; announcements by broadcasting station and cir-

HALLOWEEN PRANKS BY AIR THE LATEST



Instead of looking into a mirror to see her future mate on Halloween, the modern miss hooks up the receiver and tries for her mate's voice coming in over DX. Here is pretty May West doing it. She wouldn't have had to wait long, if you had known, would she? Keystone View Photo

ular letters sent to every available name. The response was tremendous. Hundreds of compositions were sent in, and are continuing to come in every day. The Bureau of Music Release reviews these musical numbers and when one is found to be of good musical quality and clear lyrics, negotiations are opened with the owner of the copyright on this basis:

1. Standard compositions (as distinguished from popular and jazz) are broadcast without any financial return to the Broadcasters Association, on the theory that broadcasters want to do their part in fostering American musical genius.
2. Dance, jazz, blue and other types of

music described as "popular" are broadcast under special contracts whereby varying percentages of "mechanical royalties" are conveyed to the Association. It is from this latter class of music therefore that this association is developing an income distributable to members upon an equitable basis and to be used by members for support of broadcasting.

Earnings Aid Broadcasting
This is the first daylight on the much discussed question of where money is to come from to help support broadcasting. England tried to tax receiving sets. This could not be done in this country. Placing a tax on tubes has been suggested. For obvious reasons this is impracticable. Then
(Continued on page 5)

Thrills from Radio

No. 4 of a Series Featuring Experiences of "ALL-AMERICAN" Users

Made Reflex Circuit Work Perfectly

By Harold M. Weinberger, Nashville, Tenn.

"I wish to congratulate you on the efficiency of your 'All-American' Radio Frequency Transformer. It is, in my opinion, one of if not the best transformers that have ever been made.

"I built a one tube Reflex Circuit for which another make of R. F. Transformer use was especially made.

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Without distortion, "All-Americans" bring in distant and nearby stations with volume and tone-quality that mean real thrills.

They are the best known, most widely used transformers on the market. Standard equipment on the better sets. Why experiment?—over 300,000 radio enthusiasts, like Mr. Weinberger, have already proved "All-Americans" best.

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All the better dealers sell "ALL-AMERICAN"

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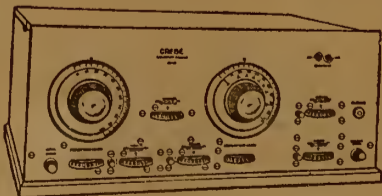
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Broadcast Receiver



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THE

AUDIOPHONE

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gives additional VOLUME with any two stage amplifier. No C batteries required. It provides the additional volume necessary to bring in very distant stations on the loud speaker.

Write for bulletin and address of the nearest dealer handling our instruments

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WATERBURY, CONN.

Boston New York Philadelphia Pittsburgh Detroit Chicago St. Louis San Francisco



ROMEO DOES HIS STUFF FROM KYW

GOUNOD'S OPERA TO GO ON AIR NOVEMBER 22

Synopsis of Action to Be Read between Scenes for Invisible Audience

CHICAGO.—Get out your works of Shakespeare, turn to "Romeo and Juliet" and review, for the next opera on the air will be Charles Gounod's popular love duet, based on the famous English dramatist's play. Announcement is made that "Romeo et Juliette" will be broadcast by Station KYW on the evening of November 22, direct from the Auditorium Theater where the Chicago Opera Company is holding sway.

The three operas already broadcast this season from KYW, the Westinghouse station here, have proved very pleasing to the invisible audience of opera-Radiophans, as attested by thousands of letters received at the broadcasting studio.

Mason and Hackett to Sing
Edith Mason, the famous American soprano, will sing the role of "Juliet," while Charles Hackett, tenor, another American, will make his first appearance this year, as a guest artist, in the rôle of "Romeo." Although at the time of writing the remainder of the cast was undecided, it was believed that Cesare Formichi, the Italian baritone, and Edouard Cotreuil, distinguished French basso, would sing in the tragic opera.

The opera, as was said, follows closely the action of Shakespeare's great love drama, except for the interruption of the balcony scene, and for the abbreviation of the cast in order to reduce the length of the drama when sung. As it is, there are five acts.

Ether Opera to Begin at 7:45
Following the precedent of the three operas already put on the air this season, A. W. "Sen" Kaney, KYW announcer, will begin the ether production at 7:45 p. m., Central Standard time, with a short history of the opera and a synopsis of the first act.

Between acts, Mr. Kaney will explain the action to take place in the following act. His knowledge of operas and clear enunciation provide the missing link so necessary to visualize the beautiful love-drama for the unseeing listeners in.

Mrs. George B. Foster, well known in Chicago society, has prepared the synopses of the various acts, together with a short history of Gounod's composition.

U. S. Has Job for Radio Man

WASHINGTON, D. C.—The United States Civil Service Commission has announced that a position is open in the army signal corps at Camp Alfred Vail, N. J., for a Radio laboratory aid, a Radio laboratorian and a junior Radio engineer. Certain specified education, training, and experience are required and competitors will be examined December 5. They will be rated as follows: General physics, twenty percent; mathematics through calculus, twenty-five percent; practical questions on Radio engineering, thirty percent; and education, training, and experience, twenty-five percent.

Col. Edward H. R. Green, son of Hetty Green, who operates Station WMAF at Round Hills, Mass., has a hobby for large loud speakers. While conducting some tests residents six miles away heard the music and spoken messages.

Charles Hackett, left, makes his first appearance this season with Chicago Civic Opera Company as guest artist in role of "Romeo"

Edith Mason as "Juliet" in "Romeo and Juliet," to be broadcast Thursday, November 22. Cesare Formichi, right, baritone, was announced as a probable member of the cast of the opera

MUSIC TRUST SURVEY

(Continued from page 4)

there has been talk of a popular subscription from listeners. This has its defects. But here is a plan which places no additional burden on anyone and yet produces an income.

Now, what are these "mechanical royalties" heretofore mentioned and which are to yield support to broadcasting?

Copyright Owners' Profits

The Copyright Act of 1909 provides that two cents cash royalty shall be paid for each phonograph record made of a copyrighted musical number whether song or instrumental. The phonograph record manufacturer puts this two cents in the price of the record. The public therefore unconsciously pays the royalty, and this two cents on each record goes to the owner of the copyright just as directly as does two cents paid for a postage stamp go to the U. S. Government. The yearly total of these royalties reaches a very large figure.

The Copyright Act of 1909 provides for two cents to be paid by the manufacturer on each player piano roll made of a copyrighted musical number. But the act failed to take into consideration rolls made, upon which are printed the words of a song. These so-called word rolls were unknown at the time the Copyright Act of 1909 was written, but at the present time represent 95 percent of all piano player rolls made. The publisher members of the American Society of Composers, Authors and Publishers, however, were not slow in sensing a fine opportunity for more profit. Through clever manipulation, and without the law giving them specific rights, they successfully collect ten percent of the retail price on each roll made, and the ultimate consumer pays this tax without knowing anything about it. Most good player piano rolls sell for \$1.25, which means a cash return of 12½ cents on each roll sold. The piano player roll industry therefore pays a tremendous sum yearly to musical copyright owners.

Then the copyright owner also has his profit from the actual sale of sheet music which in cases of "hits" is very substantial.

"Plugging" Makes Popular Music

But phonograph and piano roll manufacturers only want to put out songs which have become popular. This popularizing of songs is the publishers' hardest job. Not only hard but costly. How does he accomplish "popularization"? How does he create enough of a demand for his song so that leading manufacturers such as the Victor Talking Machine Company and the Q. R. S. Piano Player Roll Company will seek him?

Why, by doing what he calls "plugging" his songs through every known channel. He employs an active professional department; influences prominent stage folk, orchestras and other performers to use his

song by frequently, if not usually, paying many good, round hard dollars to them; sends his staff singers around and forces them on programs wherever possible; pushes his song over music counters

privately owned; advertises in theatrical, musical and other mediums; sends out free many orchestral and "professional" copies of his song; provides elaborate and costly posters, window cards, movie films; circularizes music dealers, song shops, phonograph stores and various types of merchants; employs traveling men and in many ways "not apparent to the naked eye" does he plug his song.

(TO BE CONTINUED.)

Canadian Boys Organize a League All Their Own

TORONTO, ONT.—A boys' Radio league is shortly to be organized in Toronto, Montreal, Winnipeg and Vancouver. The first meeting of the executive council was held here recently when preliminary plans were discussed. The object of the new association is to interest boys between the ages of ten and twenty years in Radio in all its branches.

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MIKE DRESSES FOR HALLOWEEN PARTY



One of the popular Class B stations staged a Halloween party recently and "Mike" (the microphone) was dressed up in this fashion. He ought to have scared witches away!

Relay Boston Broadcasts to Station in Providence

PROVIDENCE, R. I.—Broadcasts from Station WNC, the Shepard Stores, in Boston are now being relayed to WEAN, the Shepard Stores plant in this city, by a special telephone line and broadcast from the latter station simultaneously. This will give the Boston broadcasts a much larger area, as WEAN covers the southeastern part of New England. While the Providence station is low power, only 100 watts, and on a wave length below WNAC, it is covering the area around this city very well and by this new arrangement Rhode Island fans are assured much better programs.

Concerts for Kids to Be Broadcast by WWJ

Nine Detroit Programs Will Be Carried over Entire State

DETROIT.—It is announced that nine school concerts by the Detroit Symphony Orchestra will be broadcast this winter by WWJ, the Detroit News. The concerts are to be given for school children by the Symphony Society and will form a part of the state music memory contest. Through the broadcasting services by Station WWJ, the music as it is played in Orchestra Hall here will be given to all other schools in the state and country which possess receiving sets.

There will be five separate programs given on ten dates, that is, five of the concerts are repetitions of other programs. The concerts will be broadcast December 3, 10, Jan. 14 and 21, February 25, March 3 and 31 and April 7.

OFFER PRIZES FOR HOMEMADE OUTFITS

Boston Show to Give One Set Away Daily to Visitors

BOSTON.—Amateur set builders of New England will have an opportunity to enter their handiwork in the amateur set contest of the Boston Radio Show, which opens December 3 here in Horticultural Hall. There will be a class for boys and girls of ten years or younger, and one for all above that age. A \$25 prize in each class for the best workmanship and another of \$25 for greatest originality of design are offered in the contest.

Among the advertising features will be the free gift of a high-grade set to some one of the visitors each day by lot. Another feature will be the free sending of Radio messages to any part of the country. Sheldon Fairbanks, who managed the two previous shows, is the director of this year's show.

WGY Controls Beach Lights

SCHENECTADY, N. Y.—WGY here indirectly controls the turning on and off of the street lights at Howard Beach, about twenty-five miles from New York. William L. Welling of that place reports that he depends on WGY for the correct time for the proper setting of the time clock which controls the operation of street lights in Howard Beach.

RADIO TALKS

If one is inexperienced and uncertain as to which is the preferable piece of apparatus to purchase for his set he will be moderately safe if he remembers that in a given wave-length class, the apparatus that covers the greatest range is liable to be of better design. Remember also that it takes a real piece of apparatus to operate satisfactorily below 200 meters. A tuning condenser that will work around 100 meters or less is a real condenser and the same applies for a tuning unit. Such apparatus is a guarantee of best results for broadest reception. *E. T. Flewelling*

Visit our booth at the Radio Show, Coliseum, Chicago — Space 83.

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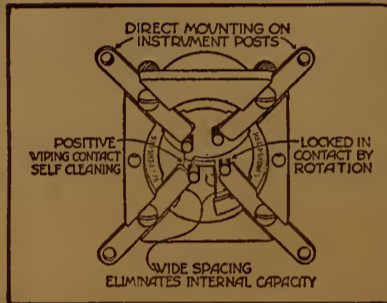
This socket was designed by Mr. E. T. Flewelling to have the smallest possible amount of undesirable capacity effects between terminals—note how far apart they are. Spacing and shape of radio contact springs make this the ideal socket for radio frequency and reflex circuits and its use increases the efficiency of any radio set.

Tube cannot shake loose or break in your hand and will always have a positive connection at each terminal.

The design of this socket involved careful consideration of every detail, electrical and mechanical, to enable you to secure greatest efficiency in this vital part of your set.

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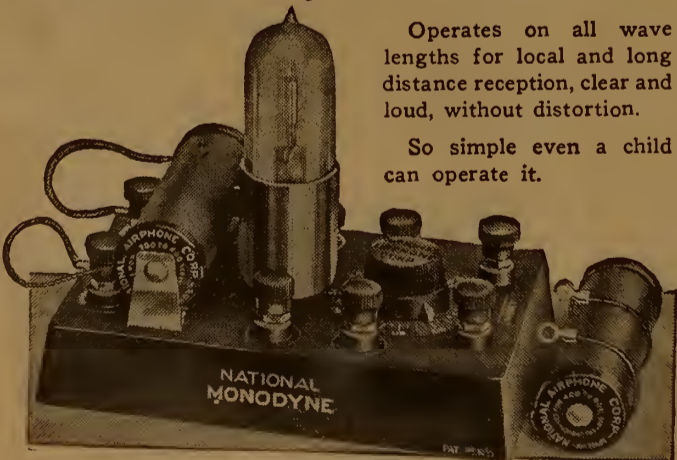
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3 Tube Sockets, Bakelite Bases.....	\$ 2.70
2 Radiometers, \$3.00 each.....	6.00
1 .0005 Condenser, Variable Vernier.....	6.00
1 Honeycomb, 75 turn.....	1.20
1 Single Coil Mounting.....	.50
1 Variable Grid Leak and Condenser.....	1.00
2 Transformers, Audio Frequency.....	8.00
3 Rheostats.....	3.00
1 .00025 Mfd. Fixed Mica Condenser.....	.40
1 .005 Mfd. Fixed Mica Condenser.....	.75
1 Set Readem Binding Posts.....	.75
12 feet of Bus Wire.....	.30
2 Double Circuit Jacks.....	1.80
1 Open Circuit Jack.....	.75
3 3" Dials.....	1.00
1 3 1/2" Dial.....	.75
1 Panel, Bakelite, 9x14x 1/2.....	2.50
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1 Cabinet, 9x14x8", fine mahog. finish.....	6.50
Including blue print with panel layout, OUR PRICE.....	\$39.75
TOTAL \$44.15	

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(See Radio Digest, September 29th issue)

3 Bakelite Base Sockets.....	\$ 2.25
3 Rheostats.....	3.00
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1 Double Circuit Jack.....	1.80
1 Open Circuit Jack.....	.75
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1 Variable Grid Leak and Condenser.....	1.00
1 .0005 Variable Condenser with Vernier.....	6.00
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1 75-turn Honeycomb Coil, mounted.....	1.20
1 Single Coil Mounting.....	.50
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1 .00025 Variable Condenser.....	2.00
1 Variable Grid Leak.....	.75
1 .00025 Mica Fixed Condenser.....	.40
2 .002 Phone Condensers.....	.80
3 3 1/2-Inch Dials, each 75c.....	\$2.25
1 Potentiometer, 1850 ohm.....	2.20
1 Rheostat.....	1.00
1 Socket Bakelite Base.....	.90
1 Bakelite Panel 9x14x 1/2.....	2.50
1 DeForest D.V. 6 Tube.....	6.50
TOTAL.....	\$35.70

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1 Tricoil Transformer.....	2.00
1 Audio Transformer.....	4.00
1 199 Socket.....	.90
1 199 Tube.....	6.50
1 Baseboard, 7x9.....	.25
1 7x9x 1/2 Bakelite Panel.....	1.25
1 Set Readem Binding Post.....	.75
2 .002 Micon Fixed Condensers.....	.80
1 Type B. B. Metal Detector.....	1.50
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Variable Condenser, .001 (Same as 45 plate).....	6.00	3.50
Variable Condenser, with Vernier, .001.....	7.50	5.00
Walnut Variable Condenser, .00025.....	1.75	
Bakelite, cut all sizes, 1/8" thickness.....	2c square inch	
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9x14x8, mahogany finish.....	\$3.25	
7x 9x8, mahogany finish.....	2.75	
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Charts and Descriptions of First Two Lessons Herewith—Four More Lessons to Go on Air

Learn to dance by listening in! Radio Digest has perfected an arrangement with Arthur Murray, nationally known teacher of ballroom dancing, whereby Mr. Murray will broadcast dancing lessons from WOR, L. Bamberger and Company, Newark, N. J., and it is planned from a score of other prominent stations. Radio Digest exclusively will give the charts and instructions which apply to the lessons broadcast by Mr. Murray personally at WOR and by the other stations. The first two lessons with charts are given below. These may be used in conjunction with the broadcast lessons. The complete course will occupy six lessons, one of which will be given each week, following the first two which are given below. Save the lessons to use with the broadcasts.—The Editor.

LESSON I—THE FOX TROT By Arthur Murray

How to Lead

THE SECRET of being a good leader in dancing is to know exactly how to do each step—and then to dance in a decided manner. You must be sure of what you are doing. If you are uncertain as to how the steps are to be done, how is your partner to know?

If you know the steps and can do them well yourself, then guide your partner firmly with your right arm and hand, and she will follow if she knows anything about dancing.

There is a mistaken impression that the man must guide by pushing and pulling. This is unnecessary if your partner is a good dancer. The good dancer never thinks of how he is leading his partner; he simply does his own part well.

How to Hold Right Hand

Hold your right hand firmly just below the lady's shoulder blade. You cannot lead if your hand is too low and if you hold your partner loosely.

You will need to do a bit of guiding sometimes with a partner who is not familiar with your steps. Then indicate to your partner with your right hand or arm. The left arm does not help very much in leading.

It is not best for the beginner to attempt to lead forcibly, as only advanced and intricate steps need forceful guiding. The beginner should learn his own part well. He will then find that his partner will follow without any help, even when she is only a fair dancer.

Man Should Not Count

Don't count or tell your partner what to do next. By showing your partner that you really know what you are doing, you gain her confidence. She will follow you readily if she has faith in your ability.

Standing correctly and holding your partner in a comfortable position are of great help in leading successfully. Remember to stand erect. Be natural as well as comfortable and not too close to your partner, yet not too far away. At all times move easily and smoothly. The illustration shows the proper position of the head, arms, hands and body. The lady rests her hand lightly at the back of the man's right shoulder.

The man looks over the lady's right shoulder. The lady may face in the same direction, but it is advisable for her to

FOOT-STEPS FOR DANCE LESSONS

Man's Part Lady's Part

Begin at "start" and go backwards with right foot (shaded). Follow the numbers in the foot prints.

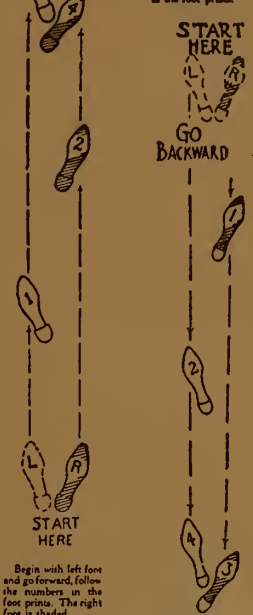


Figure 1 Figure 2

THE TWO-STEP TO LEFT



Figure 3

THE TWO-STEP TO RIGHT

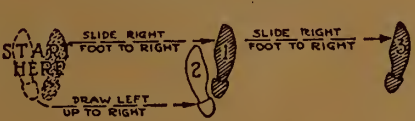


Figure 4

look over her partner's right shoulder.

Hold Firm; Stand Erect

The man holds his arms fairly high. He should hold his partner firmly, especially with the right arm and hand. Let the lady feel the pressure of your hand at her back (under the shoulder blade, above the waist line), and not have a "jelly fish" hold. The lady has more confidence in you if you hold firmly. The left arm is bent at the elbow. Dance on the toes and the balls of the feet. Do not let the heels touch the floor.

To look well while dancing, make yourself tall; hold your head up high, chin in, chest out. Dance as though your body were floating through the air. Keep your legs close together; do not spread them apart.

Cut Step or the Chassé—Man's Part

This step is one of the standard and most popular steps of the Fox Trot and One Step. It is sometimes referred to as the "Cut Step" because on the fourth step the man draws his right foot up to the left. Here is how the step is done:

At the "start" stand erect with your heels together. Then—1. Begin with the left foot and step directly forward, taking an ordinary walking step; 2. Walk for-

THE TWO-STEP IN THE FOX TROT

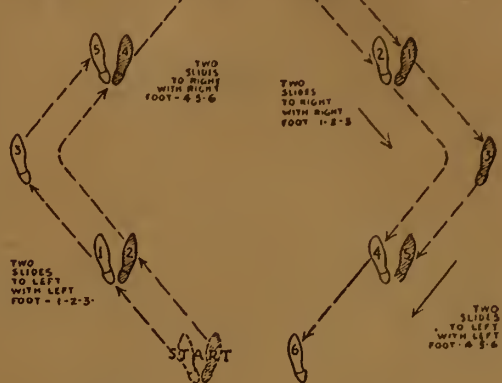


Figure 5

Figure 6

ward on right foot; 3. Walk forward on left foot; 4. Draw the right foot up to the left, placing weight on right foot. That's all.

Follow the numbers in the foot-steps shown in Figure 1.

If you want to repeat the step, begin with the left foot.

The Chassé may also be used in the One Step and the Waltz Canter. At first it is advisable to learn to dance the Chassé to Fox Trot music. After you learn it in the Fox Trot, you will have no difficulty in dancing it to One-Step or Waltz music.

The walking steps in the Fox Trot are long and slow. Each walking step takes a full second. The man generally walks forward so that he can see where to go. If the man dances backward he may collide with other couples.

The Chassé—Lady's Part

The lady's part in the Chassé is just the opposite of the man's part. Start anywhere. Stand erect, with your heels together. Remember that the lady goes backward when the man goes forward.

1. Begin with right foot and step directly backward; 2. Walk backward on left foot; 3. Walk backward (long step) on right foot; 4. Draw the left foot up to the right, placing weight on left foot. That's all.

Follow the numbers in the foot-steps shown in Figure 2.

In the Chassé, as in other steps of the One Step and Fox Trot, the lady walks backward. To dance backwards may seem difficult at first, but with a little practice you will find it even easier than going forward.

Although the Chassé may also be used in the One Step and the Waltz Canter, it is most popular in the Fox Trot. Practice it going backward around the room, remembering to take long, slow steps. Each step is given a full second.

Remember to dance on the toes. Do not let your heels touch the floor.

LESSON II—THE TWO-STEP

In the Fox Trot

What the Two-Step Is

Remember that a Two-Step is simply two sliding steps.

Beginning with the left foot, slide sideways two steps with the left foot. This you count:

1. Slide left foot directly to left; 2. Draw up right foot; 3. Slide left foot to left, weight on left. (Take right foot slightly off the floor.)

This completes a Two-Step to the right. See Figure 3.

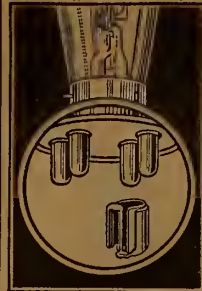
The second part, two slides to right, is taken with the right foot:

1. Slide right foot to right; 2. Draw up left foot to right; 3. Slide right foot to right, weight on right. (Take left foot off the floor.)

(Continued on page 8)

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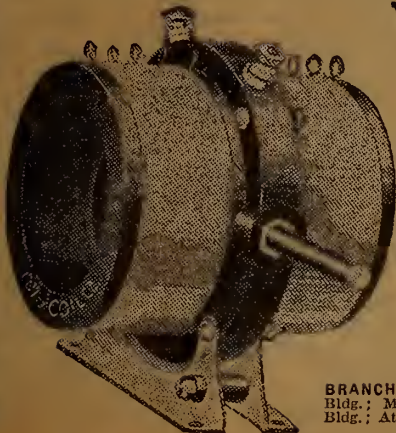
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Yours truly,
Mr. Harvey F. Reese.

9/26/23

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RADIO DANCE LESSONS

(Continued from page 7)

This completes a Two-Step to the right. See Figure 4.

To repeat, begin with the left foot and do the first part. Practice two slides to the left and two slides to right for thirty minutes.

The Forward Two-Step—Man's Part

In these instructions, "slide" indicates a sidewise movement. In the modern dances you do not actually slide or scrape the floor. Lift your feet slightly off the floor. The word slide will mean "step sidewise." Each step is about eighteen inches long.

The right and left two-step was explained first as merely a practice step and is not used in actual dancing.

The forward Two-Step is the easiest and most commonly used step in the Fox Trot. Once mastered, the turns and other steps are comparatively simple. The count is exactly the same as the right and left Two-Step given in the previous paragraphs.

Note that in the first Two-Step (count 1, 2, 3) you go toward the upper left corner. Then you Two-Step toward the upper right corner (count 4, 5, 6). In this way you advance forward instead of remaining on the same spot as in the Two-Step to the right and left, explained in the previous paragraph.

Start with the feet together as in Figure 5.

1. Slide left foot diagonally to left (toward upper left corner); 2. Draw right foot up to left; 3. Slide left foot again to the left, with weight on the left. This completes the first Two-Step; 4. Slide right foot to right; 5. Draw left foot up to right; 6. Slide right foot again to right, with weight on the right. This completes the second Two-Step.

Repeat the entire forward Two-Step of six counts and practice this step going around the room in the line of direction. Spend at least an hour.

The Backward Two-Step—Lady's Part

This movement is just the opposite of the forward Two-Step. It is the step the lady takes when the man goes forward. See Figure 6.

1. Slide the foot diagonally backward and to the right; 2. Draw left foot up to the right foot; 3. Slide right backward again, in the same direction as first step. This completes the first Two-Step. 4. Slide left foot diagonally backward to left; 5. Draw right foot up to left foot; 6. Slide left foot backward to left.

Study Figure 6 carefully and do each step slowly at first, then gradually faster

and faster until you can dance the backward Two-Step without counting.

Confidence is the very basis of achievement. There is a tremendous power in the conviction that you can do a thing.

You cannot build without a foundation. The forward and backward movements are the beginner's foundation for the Fox Trot. The steps to follow will be extremely simple if you know perfectly the steps described in the foregoing paragraphs.

Ask yourself: Do I know that a Two-Step is simply two slide steps taken sidewise? Do I know that the forward Two-Step consist of a Two-Step to the left and a Two-Step to the right. Do I know that the backward Two-Step is the counterpart of the forward Two-Step and that when the man does the forward Two-Step the lady does the backward Two-Step? Do I know that the lady always begins with her right foot?

Walking Steps and the Two-Step

We will now combine the walking steps with the Two-Step. The man will walk forward four steps, then take the forward Two Step, while the lady walks backward four steps and does the backward Two-Step.

Man's part: Begin with the left foot and walk forward four long, slow steps. Each walking step in the Fox Trot takes a full second.

(Continued on page 9)

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Two-Stage Audio Frequency Amplifier—Parts complete in every detail for this Circuit—\$11.00
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3 Plate Variable; value, \$1.75.....	\$1.05
11 Plate Variable; value, \$2.50.....	1.20
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1 Reinartz wound coil, 1 tube socket, 1 rheostat, 1 23-plate .0005 MFD. variable condenser, 1 13-plate .00025 MFD. variable condenser, 3 inductance switches, 23 switch points and nuts, 6 switch stops and nuts, .8 binding posts, 2 3" dials, 1 variable grid leak, 1 .002 MFD. phone condenser, 23 feet bus bar wire, 1 high-grade panel ALREADY DRILLED AS PER DIAGRAM and complete instructions..... **\$10.95**
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TWO-INCH DIALS—Same design—for rheostats and potentiometer; special at..... **.25**

Filament Rheostat, 6 ohm..... .65
Filament Rheostat, 20 ohm..... .80
Filament Rheostat, 50 ohm..... .90
With 2" Dial, 15c extra.

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FRESHMAN VARIABLE RESISTANCE LEAK and MICA CONDENSER Combined..... .75

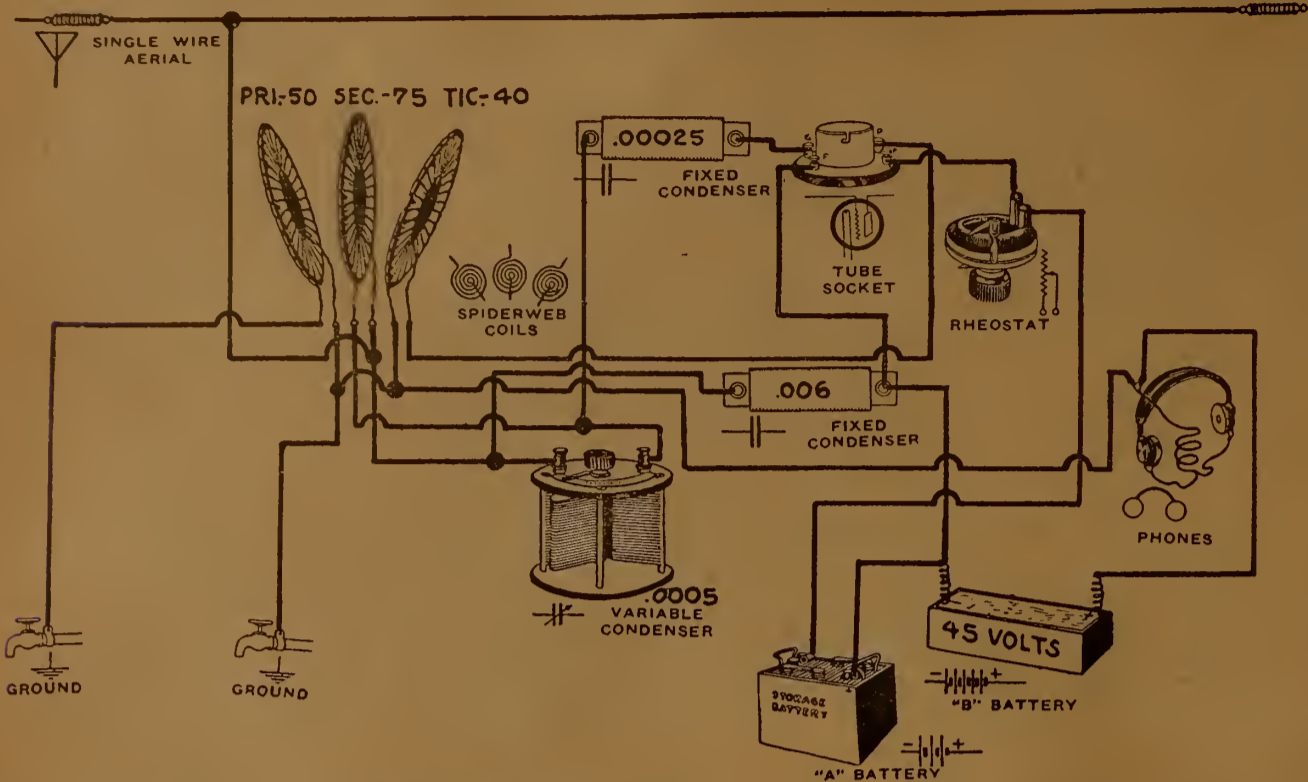


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THREE SPIDER WEB COIL HOOK-UP GIVES VOLUME



M. R. H. G. BORGFELDT of Wilmette, Ill., submits to us his diagram of a hook-up using three spider web coils which has proved to give unusual volume. Because of this fact, he thought other fans might like to try it out. We

Audion Oscillation

Very little has been said about the oscillating point of the audion. Although two vacuum tubes may be of the same type, they will not always operate efficiently under the same conditions. Vacuum tubes vary in their characteristics; there are no two bulbs alike. The main trouble with nonoscillating V. T. circuits lies in the fact that too little is given the B battery potential. When trying out a new bulb use a variable plate voltage, as some tubes are very critical, necessitating careful adjustment.

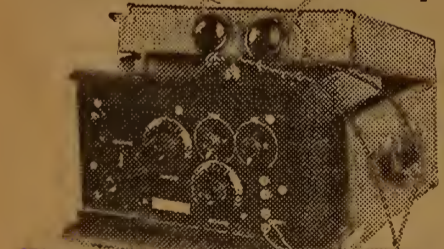
Make \$120 Weekly in Spare Time—Sell what the public wants—long distance radio receiving sets. Two sales weekly pays \$120 profit. No big investment, no canvassing. Sharpe of Colorado made \$955 in one month. Representatives wanted at once. This plan is sweeping the country—write today, giving name of your county. Ozarka, 857 Washington Blvd., Chicago.

RADIO WALL MAP 10c

Up to date, just off the press. Shows call letters, location, wave length, and kilocycles of all radio broadcasting stations; also American Relay divisions and radio districts. Complete with scale for measuring distances. Size 28x34 inches, printed in three colors. Postpaid for a dime. Ozarka, Inc., 864 Washington Blvd., Chicago

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Electro Magnetic Loudspeaker Line of Remarkable Value \$35

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Write for descriptive catalog, specifying in which set you are interested. Lytton Radio WALTER LYTTON, INC. CHICAGO

has reproduced his circuit in the form of a Simplex Diagram for the fans to construct.

He states frankly, it appears to be a form of Flewelling circuit, with some slight variations. The reception is unusually clear, without distortion.

As in the Flewelling circuit a hard or amplifier tube is required and about 45 volts or more of B battery.

The variable condenser may be either a .00025 or a .0005-mfd. capacity. A vernier attachment will be found a valuable asset.

The number of turns in the spider web coils are indicated over each one.

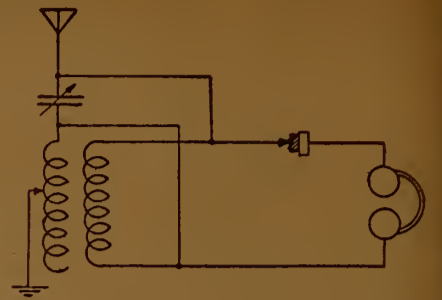
Soldering Leads to Taps

When soldering leads to the loop taps do not pull on the lead more than is necessary. The wire on the winding form will stretch and the adjacent turns will become loose.

Radio set complete, batteries, phones, tubes, \$22.50, or parts separate. J. E. Lima, 4847 North Albany avenue, Chicago, Ill.

Hook-Up for Crystal Set

Very good results may be obtained with a crystal set if the variable condenser is placed in series with the aerial and



shunted across the secondary of the coupler.

With such a circuit I have no difficulty in receiving at least one or two of the stations, WEA F, WGY, WBZ, KDKA and WHAZ, and occasionally CFCA, whereas only local stations could be heard before. Of course, it is only on quite clear nights that the stations referred to can be heard. I may add that it may be necessary to use a lower tap on the primary coil, as it will be found that by putting the condenser in this position it will increase the primary inductance.—E. B. Mulkins, Ottawa, Canada.

Never use oilcloth, as this material holds static charges.

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Tune in on station WEA F (New York)

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Supertron, Type WD-12 (silvered). An exceptionally good guaranteed dry cell tube. Oscillates in all circuits. Very sensitive. 1 1/2 volt.....\$2.98

SHACKTON VARIABLES
Moulded endplates and a unique tension holding adjustment which keeps the plates in line.
43 Plate\$1.35
23 Plate 1.15
11 Plate95

SWITCH LEVERS
Tapered knob and nicked blade. Bushing adjusts to any panel. 19c

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Stop the leaks in your antenna. These moulded insulators will do it. Very strong..... 8c

DIALS
De Forest type with brass bushing and clear, readable numbers.
4-inch45c
3-inch23c
2 1/2 inch18c
2-inch (rheostat)16c

BRUNSWICK SPECIAL
6 1/2 to 1 Audio
This transformer has a specially impregnated coil. The special construction makes distortion almost zero..... \$3.49

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A very good all-moulded rheostat. In sizes for all tubes. Complete with knob.
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No. 75 1.05
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MS

Orchestra; 7:15-
on Sports, 8:00-
40.9), 8:00 p. m.,
Dance Orchestra,
190), 9:00 p. m.,
9:30 a. m., "To-
8:00 p. m., Detroit
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430), 4:30 p. m.,
French-Canadian
Canadian Regiment
469), 10:00-10:45
Church Federation
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2:30 p. m., Clay
W. A. Paul,
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95), 10:00 a. m.,
and service from
Rev. E. E. Helms,
7:00-7:30 p. m.,
10:00, Lubovitsky

1:00 a. m., Cen-
lton, pastor, 6:30,
it - An American
speed, William
day Evening Club

476), 4:00-5:00 p.
theater; 5:00-6:00,
Choral Club, Wil-

9:15 p. m., Drake

395), 2:00-4:00
ra, Ferro Narkozi,

492), 2:45-3:45
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anch, Brooklyn Y.
ter Symphony Or-
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2:30-3:30 p. m.,
E. Anderson, Jr.,
9:30-10:00; E. W.
ana; 10:00-11:00,
Lee's Foxrotters.

95), 4:00 p. m.,
dea, Arch Street
ital.

stern, 360), 4:00
Companion; 8:30,

19), 3:00 p. m.,
German Reformed
organist.

380), 10:00 a. m.,
Rev. William H.
Y Symphony Or-
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30), 9:47 a. m.,
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pastor; 4:00-5:00,
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), 6:00-7:00, Pro-
align; 8:00, WPK
on, Glenville Pres-
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360), 3:00-4:30 p.
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an actress,
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an Lotus; Guil-

program of dance music, George Olsen's Metropolitan Orchestra; 9:00, "Oregon Resources," Alfred L. Lomax; 10:30, Hoot Owls with Pantages Frolic.
KHL, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Paul Ford, baritone; 2:30-3:30, Matinee Musical; 6:45-7:00, Children's program; 7:00-7:30, Organ recital, First Methodist Episcopal Church; Arthur Blakeley, organist; 8:00-10:00, Oberlin Alumnae; "Mission Santa Barbara," Walter F. McEntire, lecturer; 10:00-12:00, Hickman's Orchestra.
KYW, Chicago, Ill. (Central, 536), 11:35 a. m., Table talk, Mrs. A. J. Peterson; 6:50 p. m., Children's bedtime story; 10:00-11:30, Late Show; Herbie Mintz, pianist; Sallie Menkes, pianist; "Sen" Kaney, specialty act.
WBAP, Fort Worth, Tex. (Central, 476), 7:30-8:30 p. m., S. R. P. Choral Club of Jubilee Singers of the Mount Pisgah Negro Church; 9:30-10:45, North Texas State Teachers' College Orchestra.
WBZ, Springfield, Mass. (Eastern, 337), 6:00 p. m., Dinner concert, WBZ Quintette; 7:00, "A Soldier of the Air," dramatized story from the Youth's Companion; 7:30, Twilight Tales for the Kiddies; Current Book Review, R. A. MacDonald; "When Farmers Turn Business Men," Thomas Dyer; 11:00, Chamber music, WBZ Quintette; Phillip Buscemi, baritone; Mrs. Francis Regal, accompanist.
WCB, Zion, Ill. (Central, 345), 8:00 p. m., Male

WOR, Newark, N. J. (Eastern, 405), 2:30-2:45 p. m., Renata F. Walsh, soprano; 3:00-3:15, Renata F. Walsh; 3:15-3:30, Dr. Peckham; 3:30-4:00, "Half Hours with Famous Women," a talk by Neysa McMeln, illustrator, on "The Seven Most Beautiful Women I Have Painted;" 6:15-6:30, Apollo Country Club Orchestra; 6:30-6:45, Man in the Moon Stories; 7:00-7:30, Apollo Country Club Orchestra.
WOS, Jefferson City, Mo. (Central, 440.9), 8:00 p. m., Musical program, students of George R. Smith College.
WWJ, Detroit, Mich. (Eastern, 517), 9:30 a. m., "Tonight's Dinner," Woman's Editor; 12:00 m., Jean Goldkette's Orchestra; 8:30 p. m., Ann Campbell, Detroit News poet; Winifred Dell, mezzo-soprano; Bud Peltier, baritone; Edith McClary, pianist; Walter Atkinson, bass.

Saturday, November 24

CKAC, Montreal, Canada (Eastern, 430), 7:00 p. m., Kiddies' stories in French and English; 7:30, Concert, Ste. Cecile Choir, G. Dupuis, director.
KDKA, East Pittsburgh, Pa. (Eastern, 326), 1:00 p. m., Dinner concert, Dougherty's Orchestra; 2:30, Carnegie

prano; Herbert Wiess, cellist; Albert Geisser, pianist; Oriole Orchestra.
WJZ, New York, N. Y. (Eastern, 455), 1:30 p. m., Army-Navy football game; 4:45, Adelaide Travers, contralto; 5:15, Recitations, Clyde Monroe, blind artist of expression; 6:00, Uncle Wiggly Stories, Howard Garis; 7:30, Dance program and concert, Battin High School Orchestra; 8:45, "When Radio Controls Radio," Dr. Alfred N. Goldsmith.
WMAQ, Chicago, Ill. (Central, 447.5), 8:15 p. m., White Wing Band; 9:00, Weekly musical revue, Chicago Theater.
WNAC, Boston, Mass. (Eastern, 278), 2:00-4:00 p. m., Harvard-Yale football game; 4:00-4:15, Tea Dance Music, Copley-Plaza Hotel; 9:00-11:00, Dance Music, Leo F. Reisman's Egyptian Room Orchestra.
WOC, Davenport, Iowa (Central, 484), 12:00 m., Chimes; 3:30 p. m., "Hemorrhoids," C. C. Hall; 5:45, Chimes; 6:30, Sandman's visit; 9:00, P. S. C. Orchestra; V. B. Roebie, baritone.
WOO, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Organ recital, Mary E. Vogt; 12:00-12:50 p. m., Wanamaker Crystal Room Orchestra, Robert E. Golden, director; 4:45-5:00, Organ recital, Mary E. Vogt.
WOR, Newark, N. J. (Eastern, 405), 3:00-4:00 p. m., Original Highland Syncopators; 6:15-7:15, "Music

400), 4:00-5:00 p. m., Strand Theater Orchestra; "Just Among Home Folks," Gus Edwards' Orchestra; Barney Rapp's Orchestra; Walnut Theater Orchestra; Alamo Theater organ, Mrs. Zahn, Jr.
WHAZ, Troy, N. Y. (Eastern, 380), 9:00 p. m., Rensselaer Polytechnic Institute Students' Night.
WHN, New York, N. Y. (Eastern, 360), 4:00-4:30 p. m., Fred Fischer Music Co.; 7:30-8:00, Sam Lanning's Roseland Dance Orchestra; 8:15-8:30, Dorothy Brownberg, 10-year-old juvenile; 8:30-8:45, Lilyan May Challenger, mezzo-contralto; 8:45-9:00, Charles A. Bourne, jazz pianist; 9:00-9:15, Clarence D. Gelabert, tenor; 9:15-10:30, Colonial Dance Orchestra of Brooklyn; 10:30-11:00, M. Witmark & Sons.
WIP, Philadelphia, Pa. (Eastern, 509), 3:00 p. m., Artist recital; 6:05-6:45, Philadelphia Cafe Orchestra; 7:00, Bedtime stories, roll call, Uncle Wip.
WJW, Cincinnati, Ohio (Central, 309), 4:00 p. m., "What the Press Has Done for Radio Week;" Movie reviews and piano selections, Jennie Kehrt; 8:00, Program, auspices of the Editorial Staff of Sunday School Publications; 9:00, Crosley Theatrical Rertwex; Roger Hill Dance Orchestra; J. Nelson Hook, popular singer; Orville Kuster, banjoist; 10:00, Power House, J. J. Chairman Executive Committee, "National Radio Week."

Simple Explanation of Radio for Everybody

Chapter V, Part II—Condensers—Fixed and Variable

By M. W. Thompson

THE following article is the ninth of a series for Radio beginners, written by Marvin W. Thompson, well known in air-phone circles for his understandable style of approaching his subject, and his ability as a Radio engineer. Mr. Thompson is now an associate editor on the staff of Radio Digest. A preliminary outline of the Chapters to follow is:

- Chapter VI—Vacuum Tubes.
- Chapter VII—Antennas and Grounds.
- Chapter VIII—Regeneration.
- Chapter IX—Audio Frequency Amplification.
- Chapter X—Loud Speakers.

TWO early forms of variable condensers are shown in Figures 37 and 38. The condenser shown in Figure 37 consisted of 4, 6 or 8 aluminum plates, set about $\frac{1}{8}$ inch apart, between two wooden blocks, and another group of 3, 5 or 7



Figure 37—An early form a variable condenser, bulky, mechanically bad and soon discarded

plates set $\frac{1}{8}$ inch apart, which could be slid in and out of the first group, guided by slots cut in the baseboard. Fine adjustment was impossible, and this instrument took up a great deal of room. The device shown in Figure 38 consisted of two metal tubes, one fixed and one movable.

Present Day Variables

The present method of making variable condensers is shown in Figure 39. The fixed plates are cut in half circles and supported about $\frac{1}{8}$ inch apart by three pillars placed, one at each end of the semicircle of the outer edge and one at its center, opposite the center of the straight edge. The movable plates are also half circles but slightly smaller, and are supported $\frac{1}{8}$ inch apart by washers placed on a shaft which is also used to

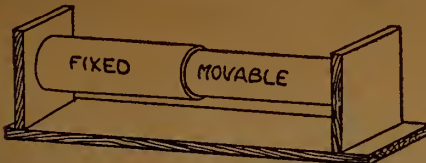


Figure 38—Another now extinct type of variable condenser

revolve them. Various types of bearings are used at the ends of this shaft to give smooth turning action yet not permit the movable plates to change their equidistant spacing between the fixed plates when within them.



Unequaled Clearness Thru a New Magnetic Principle of Construction

Distant and local broadcasting reproduced without distortion. Endorsed by Radio Experts—Lieut. Commander Reason, U. S. Navy says: "I use your headset in preference to others in experimental work."

Trial Offer If your dealer is out of "Repeaters" send \$5.00 and dealer's name for complete set subject to refund in full within 10 days if not perfectly satisfactory.

Moss-Schury Mfg. Co., Inc.
Radio Division
2011-15 Franklin Street, Detroit, U. S. A.
Manufacturers of precision electrical devices

No matter what type of bearing is used, connection to the movable plates through the bearing is bad practice. In Figure 40 is shown what is known as a "pig-tail" connection. This takes the form of a thin, narrow metal strip or piece of braided

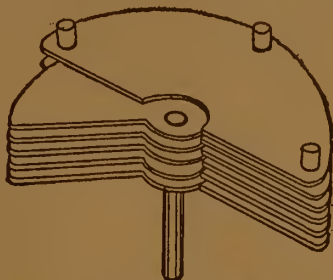


Figure 39—The better method of arranging plates in a variable condenser

wire, coiled like a watch spring, its inner end soldered to the shaft and its outer end anchored to the nonconductive end plates of the condenser. Connection is then made to the metal anchor. The coiled spring merely contracts or uncoils as the plates are turned and a positive, nonsliding connection is made at all times.

Verniers

It was long ago found that the turning of the large group of movable plates did not permit sufficiently fine adjustments for accurate, close tuning, and the introduction of the vernier was the result. Figure 41 shows a simple, economical method of obtaining vernier control. A

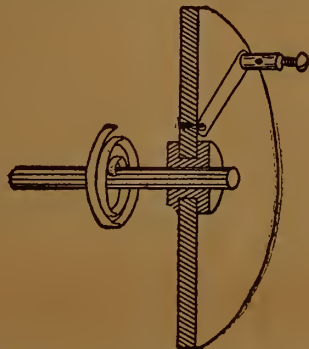


Figure 40—The pig-tail connection to the movable plates of a variable condenser

small rubber-tired wheel is mounted against the rim of the large 3 or 4-inch dial, and turning the circumference of the small wheel through an arc of 20°

Radio Call Cards printed to order. Red call, black printing, 100, \$1.75; 200, \$2.75, prepaid. Color changes, 35c extra. Government postals, 1c extra each card. Letterheads, 8 1/2 x 5 1/2, and envelopes, 100 each, \$2.25; 200 each, \$3.50. ARRL emblem used on cards or stationery if requested. Send today. Department 48 C, Radio Printers, Mendota, Illinois.

IF YOU CAN'T BUY THEM AT YOUR DEALER'S SEND DIRECT TO US

"Red-Heads" are guaranteed radio phones. You run no risk when you buy them. Money back if, after 7 days' trial, you're not satisfied that they're the best receivers on the market at the price. Why not act right now and get a pair? It'll mean getting the maximum from broadcasting from the day you put them into use.

RED-HEAD RADIO RECEIVERS

These remarkable head-sets are made by The Newman-Stern Co., one of the pioneer radio manufacturing houses in America.

JUST OUT

The new 1924 Model F **\$6.50** PER PAIR Complete

The new 1924 "Red-Head" Jr. **\$5.00** PER PAIR Complete

The Junior Model has most of the quality features of the standard Model F here described. The resistance is 2,000 ohms per set instead of 3,000 ohms. A remarkable value.

"Red-Heads" sent prepaid on receipt of price if you are unable to get them at your dealer's.

THE NEWMAN-STERN COMPANY
Dept. RD Newman-Stern Bldg. Cleveland

turns the large wheel only 1 or 2°. It is possible to turn the small wheel but 2 or 3° and so move the large dial only a fraction of a degree. This means of getting vernier control is the most economical and is usually very satisfactory.

The experimenter who can afford to pay a little more for his condensers should buy the type shown by Figure 42. Condensers of this type cost more because of the greater complexity of their construction. A double shaft is necessary, consisting of an outer hollow shaft to which the group of movable plates is fastened, and a smaller, longer shaft to which a single movable plate is attached. This single plate can be revolved between two stationary plates or close to a single stationary plate.

Grouping Capacities

Here is a rule for the experimenter to remember as utilizing it frequently saves time and money. If condensers are con-

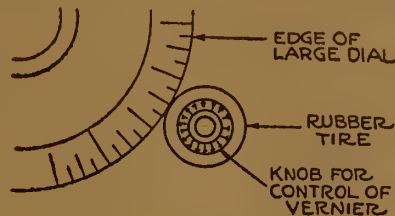


Figure 41—One method of obtaining vernier action

nected in parallel, the effective capacity is equal to the sum of the capacities of the individual units. If equal capacities are connected in series, the effective capacity is equal to the capacity of one divided by the number so connected. If a number of capacities of various values are connected

Beautiful Hand-Colored Enlargement From Your Kodak Film, \$1.00

A beautifully hand-colored photograph, enlarged to approximately 8 x 10 inches and ready for framing, can be made from any of your kodak films at the very low price of \$1.00. Enclose \$1.00 for each film to be enlarged and colored, together with the films and instructions for coloring.

WELLER ART STUDIO
35 Evanston Avenue Dayton, Ohio

in series, this formula must be applied:

$$\frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3}$$

Let us see how these rules are of value

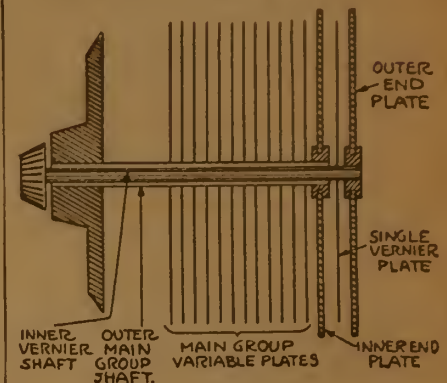


Figure 42—Another method of obtaining vernier control of capacity

in actual practice. Say, we have a variable condenser whose maximum is .001 mfd., a fixed condenser of .001 mfd. and (Continued on page 18)

CHERINGTON "NOISELESS" RHEOSTATS

Cherington "Noiseless" Rheostats are manufactured with utmost care and precision. Comparison between the Cherington and other rheostats will easily convince you of the superior quality of this instrument. The resistance elements used in Cherington Rheostats are higher than the average, so as to take care of the different characteristics of the various tubes. If your dealer does not carry in stock, will send postpaid on receipt of purchase price.

7 ohm, 32 ohm, 43 ohm.....	\$1.00 each
52 ohm, 75 ohm.....	1.25 each
Cherington Photograph Adapter.....	\$.35 to .50 each
Neutralizing Condensers.....	.50 each

Dealers, Jobbers and Distributors who write at once will receive some very interesting information.

CHERINGTON MFG., CO., Dept. 311, Waukegan, Ill.
CHICAGO OFFICE: 53 W. Jackson Blvd., Chicago

RADIO AT N.Y. PRICES

via Daily Parcel Post

The Prices Quoted Below Deliver Goods to Your Door

HOW TO ORDER—Write your order plainly; state number, description and price of items wanted. Send Post Office or Express Money Order, personal check or bank draft.

Standard Brand Head Phones

B134 Brandes Superior.....	\$5.25
B135 Dictograph.....	6.75
B136 Baldwin Type "C" Double.....	9.85
B137 Baldwin Type "C" Single.....	4.95
B138 Western Electric.....	10.50
B139 Dietzen 3000 ohm extra special.....	3.95

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Highest grade Mahogany finish Cabinets. Hinged top. These cabinets are being sold at less than one-half regular value.

B57 Wood Cabinet; panel size 7"x10". Each.....	\$2.50
B58 Wood Cabinet; panel size 7"x12".....	2.75
B59 Wood Cabinet; panel size 7"x14".....	3.00
B60 Wood Cabinet; panel size 7"x18".....	3.50
B61 Wood Cabinet; panel size 7"x21".....	3.75
B62 Wood Cabinet; panel size 7"x24".....	4.00

1 1/2 VOLT DIETZEN TUBE

Two-element Fleming valve effect; operates on one dry cell with or without "B" Battery; wiring diagram free with each tube.

B95 Dietzen Tube.....	\$1.00
B96 Socket for Dietzen Tube.....	.40

Audio Frequency Transformers

The following transformers are guaranteed standard makes, and will produce very efficient results.

B63 Dietzen 3 to 1 Ratio.....	\$3.95
B64 Dietzen 5 to 1 Ratio.....	3.95
B65 Dietzen 10 to 1 Ratio.....	3.95
B68 Acme Audio.....	4.25
B67 Amertran.....	5.95
B68 U.V. 712 R.C.A.....	5.75
B69 U.V. 714 R.C.A.....	5.75

Wave Trap

Simplifies tuning. Eliminates interfering stations, thereby improving the selectivity of your set. Selects between conflicting stations. Special while quantity lasts.

B131.....	\$4.95
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Modell's

ESTABLISHED 1883

71 Cortlandt Street NEW YORK, N. Y.

America's Greatest Radio Mail Order House
ELEVEN NEW YORK STORES

MISCELLANEOUS

B163 Spaghetti Tubing per yd.....	\$.09
B164 Synthetic Crystal.....	.30
B165 Ground Clamps.....	.17
B166 Black Rubber Binding Posts.....	.05
B167 Nickel Plated Binding Posts, 2 for.....	.05
B168 No. 13 Annunciator Wire, half pound coil.....	.39
B169 6 ft. Phone Cord with Tips.....	.79
B170 20 ft. Extension Cord with Tips.....	1.95
B171 Wall Insulators, Porcelain.....	.05
B172 Tubular Porcelain Lead-in Insulators, 6-in.....	.10
B173 Rehnartz Coil.....	1.45
B174 Cockaday Coil.....	2.42
B175 2 in. Dial and Knob.....	.25
B176 3 in. Dial and Knob.....	.35
B177 4 in. Dial and Knob.....	.49

Loop Aerial

B76. Can be assembled by anyone in five minutes; all wood parts, wire and binding posts included, complete.....69c

Plate Circuit "B" Batteries

The highest grade of battery made at prices lower than they ever were sold before.

B80—22 1/2 Volt Small.....	\$1.15
B81—20 1/2 Volt Medium.....	1.45
B82—22 1/2 Volt Large.....	1.95
B83—45 Volt Medium.....	1.95
B84—45 Volt Large.....	2.50
B85—45 Volt Extra Large.....	3.50
B86—360 Hour 1 1/2 Volt Twin Double Duty "A" Battery.....	.75

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Home Runs Count

Average Person Little Cares for the Why of a Thing

POPULAR discussion of the moment concerns, to some extent, who is first in Radio. Whether Marconi, De Forest, Armstrong or who else is selected as the very first to make possible Radio reception, the fact remains that the forces employed came with the creation of this globe and its attendant gaseous (or atmospheric) envelope. An Einstein theory thrown in here and there cannot make any difference to the known or latent forces of the earth or the influences exerted upon it by the planetary system. Science advances on man's mental wings and mechanical fabrications enable the use of natural forces.

Radio sending and receiving take small toll of the average mind when it comes to the whys and wherefores of Radio operation—the busy brain of the American has, as a rule, little of the inquisitive; if results are secured, satisfaction reaches its pinnacle. Why a ball is propelled by a bat is of no consequence—the home run itself is all that counts.

New Political Medium

Press to Take a Back Seat in Politics

RADIO will be the greatest political medium of the future. It will take the place of the press, to a large extent, in molding public opinion. It is not likely that broadcasting stations will take sides and cast their lot with certain party leaders. It is quite certain that every aspirant to public office will fight for an opportunity to broadcast the messages he knows must reach the voters.

What political leaders really are preparing to do is to take advantage of the non-partisan attitude of the Radio stations and to use these to the greatest advantage.

There is no man or woman who would not like to hear the voice of any candidate for the presidency, for a United States senatorship or for a governorship. There is no man or woman that would not be more impressed by hearing the voice of the candidate than by reading often distorted accounts of the speech in the partisan press. Broadcasting of vital political messages will bring them to the public without editorial comment.

The wise candidate is preparing even now the broadcast of addresses he knows he must make during the campaign.

Two Kinds of Apparatus

Impulses from the Human Body Not Like Radio

WHILE it is true that something closely akin to the Radio impulses emanates from the human body and can be picked up, amplified and returned by an apparatus correctly assembled from some of the standard Radio parts, not all Radio apparatus will accomplish this result. An analogy would be the crude parts used in a harrow, a farm wagon, or a threshing machine. While it is true that a half-inch bolt is a half-inch bolt regardless of where you find it, it would never do to utilize bolts of the quality used to hold a farm wagon or stove together in the building of a fine automobile engine. The bolts would hold the engine together all right so long as it was at rest, but immediately it went into operation the stress would prove greater than the bolts would be able to withstand. So it is with the ordinary Radio apparatus as compared with the electronic apparatus.

Long ago it was found that the standard windings as used in Radio apparatus were absolutely unsuitable for electronic apparatus. Likewise standard condensers are absolutely useless in the electronic therapeutic apparatus for reasons which should be apparent to students of the deeper phases of high frequency phenomena.

A warning should be sounded in order that Radio enthusiasts the world over may be deterred from plunging blindly into the attempt to make therapeutic apparatus. Such apparatus would doubtless prove quite harmless, though ineffective. The damage would come from the raising of false hopes in the minds of afflicted persons which would cause them to defer consulting a competent practitioner until too late.

RADIO INDI-GEST

Interducing the Kink's Best

Ah, we never fail. We promised you last week that King Miloplex' Sheba would be right on deck. And here she is! She's no other than the better 4/5, alias Mrs. King Miloplex, alias Queen Miloplex, alias Maggie the cook. Yes, the Queen always smiles like this. Cam Era, Indi-Gest staff photographer, caught her expression at its best, when she was enjoying her favorite pastime. That is, she was on the well-known warpath for the King. (You can tell she's a queen. But with the hearts on her waist and the club in her hand, we don't know which suit she is queen of.)



The bloody stains on her apron are from the King's own life stream, deducted therefrom by bouncing the rolling pin on the crown of Miloplex.

Well, we've got a lot to say to get around this photograph so let's dig up some more dirt. Oh, yes, the Queen rules the throne. Absolutely! We know, because we saw the big fur coat the King had to buy her for being late at all of her meals. Yes, that's straight, but don't tell a living soul.

Exit One Fur Coat

We have a 'Phan in our town,
Whose ways are wondrous wise.
He carefully hides from wife dear,
All the Radio things he buys.

H. K. C.

Our Own A. & Q. Dept.

Dear Indi: What do they mean by the word "broadcasting?"

U. R. Too.

Answer: Telling a secret to a woman.

Dear Indi: Does King Miloplex smoke Milo cigs?

I. M. Not.

Answer: No, but Maggie, his better nine-tenths, smokes Camels.

Dear Indi: What is a variometer?

Y. KNOT.

Answer: A variometer is a cross between a variocoupler and a wavemeter. The second child in the generation (according to Darwin) would be a wavecoupler.

Dear Indi: Why does papa shut off the Radio church services just when the minister announces the offering?

B. CAUSE.

Answer: Buttons cannot be sent by Radio.

Dear Indi: These here artikuls by the Mistury Man call for a split variometer. How can I make wun?

AL. LISTERATE.

Answer: Words fail us. Far better 'twould be if we were but to illustrate. See picture below.



A-B-C Lessons for Indigest Beginners Chapter XXIII—And WOAW, WHAM and KOP BY GOSH

W

IS the letter

For American stations alone,
That's why WHO, and WHY and WEAR
Make Uncle Sam's ether moan.

Let Willie Do It

Willie had a crystal set—
One he'd put together—
He could hear the jazz, you bet,
News and sports and weather.

Papa bought a Radio
Cost him "foefty-dollar";
Couldn't get a thing and so
He made an awful holler.

Papa cursed the blooming thing,
Threw it in the cellar,
Said ma'd give a better "sing"
Than the Radio feller.

Willie found the set one day,
Took it to the attic,
Fussed with wires and battery
So he'd bar out static.

When pop heard the music come
Without crash or sputter—
"Beats the dickens, sure, I vum,"
He was heard to mutter.

L'ENVOI

When the "blamed thing" won't go right,
Not a thing comes through it;
Ere you smash it up outright
Best "let Willie do it."

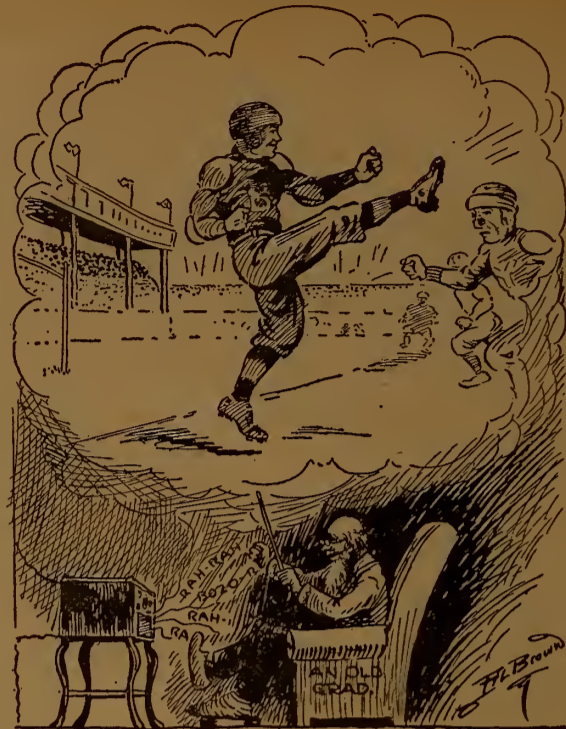
—PITTSBURGH POST.

Somebody Please Buy It

Dear Indi: Jack Nelson (of WDAP, of course) wants everybody to know that he's "Got a Song for Sale that His Sweetie Turned Down." Anyone feeling sorry for him and helping him out of his difficulty will please credit this advertisement.

Goo Goo.

Memories



Condensed

By DIELECTRIC

SOS calls came rather thick and fast one night recently from vessels on the Pacific Ocean. Four ships were involved, and there was evidence of another having been wrecked when a ship's spar and part of a cargo of apples were cast up on Vancouver Island. The battleship New Mexico figured in a collision at the mouth of Los Angeles harbor, owing to a heavy tide driving an oil tanker into her side. Thanks to "QRT-SOS," Radio carries tidings of mishaps from ship to shore, or ship to ship, and aid is obtained in most cases. It makes one shudder to think back to the time when vessels were completely out of touch with the rest of the world and their fate unknown for long periods. Yet, Radio is a fad!!

I have heard of instances where blind men have been cheated or robbed outright, and that seems vicious enough, but an incident which took place on Long Island should make every listener in wish to assist in the capture of as miserable a set of thieves as I know of. Crippled children inmates of St. Giles home at Garden City were so fortunate as to possess a very fine Radio receiving set—until lately. While the youngsters were at dinner the set was stolen, and you can imagine the grief of these poor, little, afflicted ones when "bed-time stories" were due. Have you considered helping purchase a set for others in whose lives there is mostly suffering? Let's try it; dials turn easier, if we do.

David Lloyd George made his farewell speech in the Metropolitan Opera House, New York City, but his visible audience was no doubt small in comparison with the vast number who heard everything said both by him and other speakers. Station WEAF broadcast the entire proceedings and relayed it to WCAP and WJAR, so that the majority of listeners in the eastern section of our country were able to get it all. It really makes a difference whether a speech is heard or read, in most instances, as the voice inflections give subtle meanings. To those having receiving sets it is possible to hear many men and women of prominence though they be addressing groups in halls miles away.

There probably will be discussion of the advantages and failing of religious broadcasting indefinitely; that's quite natural. But what do the Radio audiences think about it? Well, if those who listen for Doctor Cadman's talk to the men at the Bedford Branch Y. M. C. A., Brooklyn, may be chosen as typical, then such broadcasting is decidedly attractive to thousands. One woman will forgo any other engagement in order to hear this Sunday afternoon address. A number of the stations broadcast regularly the Interdenominational Sunday School lessons. What reaction does this produce? A prayer service is held at WEAF's studio each Thursday evening. Ask Mr. Harkness what he hears from listeners in.

To lovers of good music inconveniently situated for attending orchestral performances, Radio is a wonderful boon. Even those who enjoy listening to a good dance orchestra, occasionally like to tune in a station featuring a classical program. The educational value of hearing such music as played by some of America's foremost orchestras is considerable and, I believe, tends to increase attendance. WJAX provided a treat when they broadcast the Cleveland symphony orchestra concert. WGY has a large audience on Sunday afternoon listening to the numbers played by their own company organization.

Latest Development in Grimes' Inverse Duplex Part II—Overloading Prevention Circuits

By David Grimes

THE first article in this series concerning the Grimes Inverse Duplex System, written specially for the Radio Digest, introduced the reader to some of its advantages and also to the reflex field

transformers were all built to operate on the old wave lengths and the old tubes. Consequently, there weren't many of them on the market when the change came that were worth the box they were in, especially

freely. For the first time in any publication I will go into great detail in regard to all these points and will try to devote one article to each trouble or likely variation. The present article will discuss the change in circuit for controlling the Radio energy, necessitated by the above-mentioned changes in tubes and wave lengths.

You will notice in Figure 2 that there is shown, in the input circuit from the loop, a 400-ohm resistance or rheostat. This was put in the circuit to cut down or control the amount of Radio energy entering the first tube. This was necessary, particularly on local stations, to prevent what is called "overloading the tubes." In the ordinary Radio circuits, there is little or no trouble of this nature experienced. It is very likely to occur in reflex circuits, and steps must be taken to prevent it. In the straight reflex arrangements, it is much more likely to occur than in my inverse duplex. You will recall that one of the advantages of my circuit was that the Radio and audio loads in the tubes were balanced and that each tube in consequence carried its own share of the energy. In the ordinary reflex, the tube which handles both the strong Radio and strong audio is overloaded long before the others. This overloading causes poor action.

cuit is forced enough, the limits of the tubes will be reached. A vacuum tube will handle just so much amplification and no more. Hence, on local reception, it is sometimes necessary to cut down the incoming Radio energy. The 400 ohms were placed in the circuit for that purpose. To work properly this should be a pure resistance, containing neither inductance nor capacity. Most of the standard 400-ohm

(Continued on page 18)

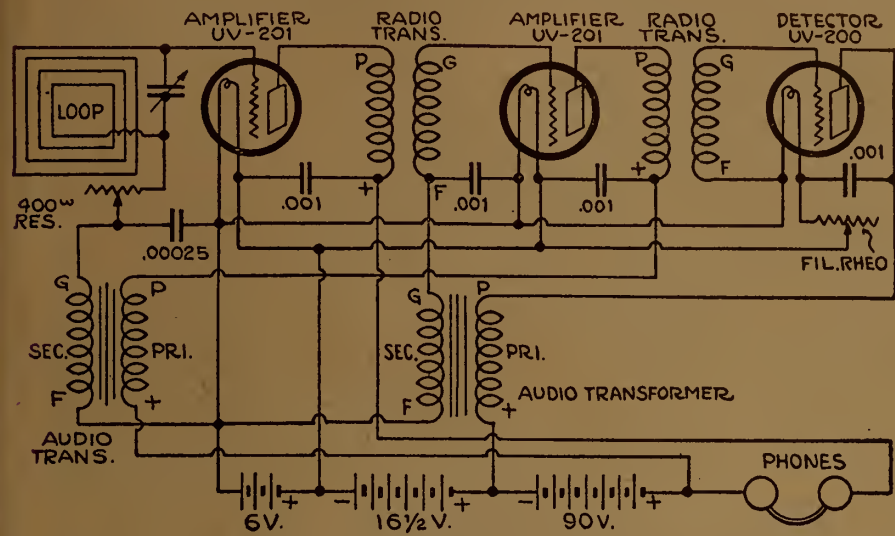


Figure 2

in general. It disclosed the prior art and showed just what relative position the circuit holds with respect to other Reflex developments. This second article will take up and discuss one of the serious defects which the original release on the inverse duplex contained. This defect was the inadequate means for controlling the amount of Radio energy entering the first tube. This was particularly troublesome when the listener was located very near to a powerful broadcasting station. It also caused difficulty with some types of Radio frequency transformers.

The Original Circuit

In order to acquaint those who are not familiar with the earlier information pertaining to my circuit, I am duplicating the entire original circuit in Figure 2. In justice to this arrangement, let it be said that it was entirely satisfactory and gave excellent results with a minimum of tuning complications. However, it required certain definite apparatus with certain constants, and this equipment was not always available to the experimenter. As soon as he departed from the specifications in any particular, his troubles began.

Almost as soon as the information went out of my hands, the UV-201 tubes became obsolete. The circuit, as shown in Figure 2, was designed for use with these tubes. The new UV-201A tubes had certain characteristics which caused trouble in my circuit and sent many an enthusiast down to defeat. These new tubes were much better amplifiers and incidentally possessed somewhat different Radio frequency capacities. This later variation caused no end of trouble with the standard Radio frequency transformers then on the market. Of course, this was a source of annoyance to other Radio frequency circuits and finally forced the manufacturers of these parts to change their design to match the new tubes.

Fate, not satisfied with this damage, sought other channels in which to work trouble, and so the wave lengths were changed and the broadcasting band broadened. Now it doesn't take a great deal of thought to realize that the Radio frequency

for loop reception. And these were the conditions which existed in the field by the time my circuit information spread about. No wonder that some gave up in disgust. The only encouraging part of the experience was that most of the old amateurs and many of the new ones were able to ferret out the difficulty and to rectify it.

Controlling the Radio Energy

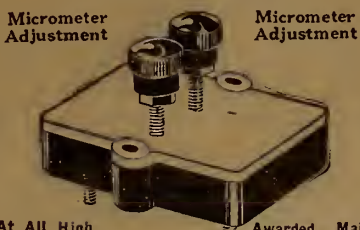
Of course, I was anxious to send out the proper data immediately, but not until now have I, for several reasons, been permitted to discuss all of these things with you

At Last, Something You Have Been Looking For

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Variable Resistance Leak Variable Condenser



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Panel Mounted 1-5 to 12 Megohms; No Sliding Contact; Dust Proof; Moisture Proof; Shielded; Best India Mica from .00002 to .0005 M. F.; No Sliding Contact; Shielded; Minimum Losses.

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PEOPLE USING MY METHODS hear programs clearly from stations
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No tubes, batteries or amplifying apparatus required. It may cost
LESS THAN A DOLLAR to perfect YOUR set.
EVERYTHING CLEARLY EXPLAINED
in my copyrighted instructions selling for \$1.00. **SATISFACTION GUARANTEED.** Picture of my set and circular matter **FREE.** **WRITE ME TODAY.**
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3.50 Fisher, Large, 90°.....	2.25
2.75 Fisher, 180°.....	1.75
VARIOMETERS	
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2.35 R. C. 23 plate.....	1.35
2.75 R. C. 43 plate.....	1.85
VERNIER CONDENSERS	
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5.00 R. C. 43 pl.....	2.95
AUDIO TRANSFORMERS	
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7.00 Federal No. 65.....	5.75
7.00 Amertran.....	5.75
PHONES	
\$8.00 Brandes Superior.....	\$5.25
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Ask to see the nationally known Columbia line of licensed bakelite apparatus. Known satisfaction. A few more Columbia items:

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Why JUNK YOUR SET?

The new Twitchell Auxiliary Tuner connected to your present set will enable you to bring in the long or short wave stations which your present equipment cannot get.
Copyrighted Tuner diagram 50c, or with all parts \$9.00.
Complete instrument in walnut cabinet ready to use, \$15.00. Transportation prepaid.
My Highly Improved Rehnartz brings in all important stations on this continent; loud, clear and without distortion. We dance to music from Atlanta and Los Angeles.
Build one of these wonderful 3-tube sets from my blueprint and specifications, price 50c, or with a perfect and complete double wound spiderweb coil, \$3.00 by mail. Picture of this set on a glass panel with every order.
This copyrighted circuit is the most successful of any Rehnartz modification yet produced, and is imitated the most. Thousands are in use.
My W. D. II Circuit is especially designed for use with the "Pickle" tube and brings out the full value of that little tube as no other circuit can. Stations 1000 miles away come in clearly on one tube. This set is small, complete, portable. For the man who wishes the highest efficiency, this is the set to build. Price of blueprint and specifications, 50c, or with complete and perfect windings, \$3.00. Photo of set with every order.
These instruments are easy to build, easy to operate. Everything clearly shown.
Sets built from these copyrighted plans will receive all broadcasting stations operating under the new laws. Their wave length range is from 170 to 800 meters.

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1925 Western Ave. Minneapolis, Minn.

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A New Superior Vernier Control

TINY-TURN makes possible an exactness in tuning never before attained. It has a 30 to 1 gear ratio. No lost motion! The vernier turns in the same direction as dial; can be instantly disengaged, leaving dial free. **INSTALLED ON ANY SET IN 3 MINUTES.** Handsome nickel and black finish. We furnish counter display demonstrating boards.

Pats. Pend. Side View showing friction drive against dial.

Price 75c

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Pats. Pend.

The DUO-SPIRAL loop reaches from coast to coast on the loud speaker. Careful tests by radio engineers have proved its superiority. Used exclusively by the largest manufacturers of radio frequency sets. It is trim and neat in appearance and handsomely finished. It rotates freely on its base. Adjustment is made easy by handsome dial and a long handle which eliminates all body capacity effects. The green double silk covered wire is kept always taut by hidden springs. The DUO-SPIRAL loop completely replaces roof antenna and ground and practically eliminates static.

24" Size \$8.50 - 12" Size \$7.50
(These prices include NEW Dial and Handle.)

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The Distinctive Binding Post

Pats. Pend.

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The above products (folders on request) are sold through dealers and jobbers. If your dealer cannot supply you, write us direct.

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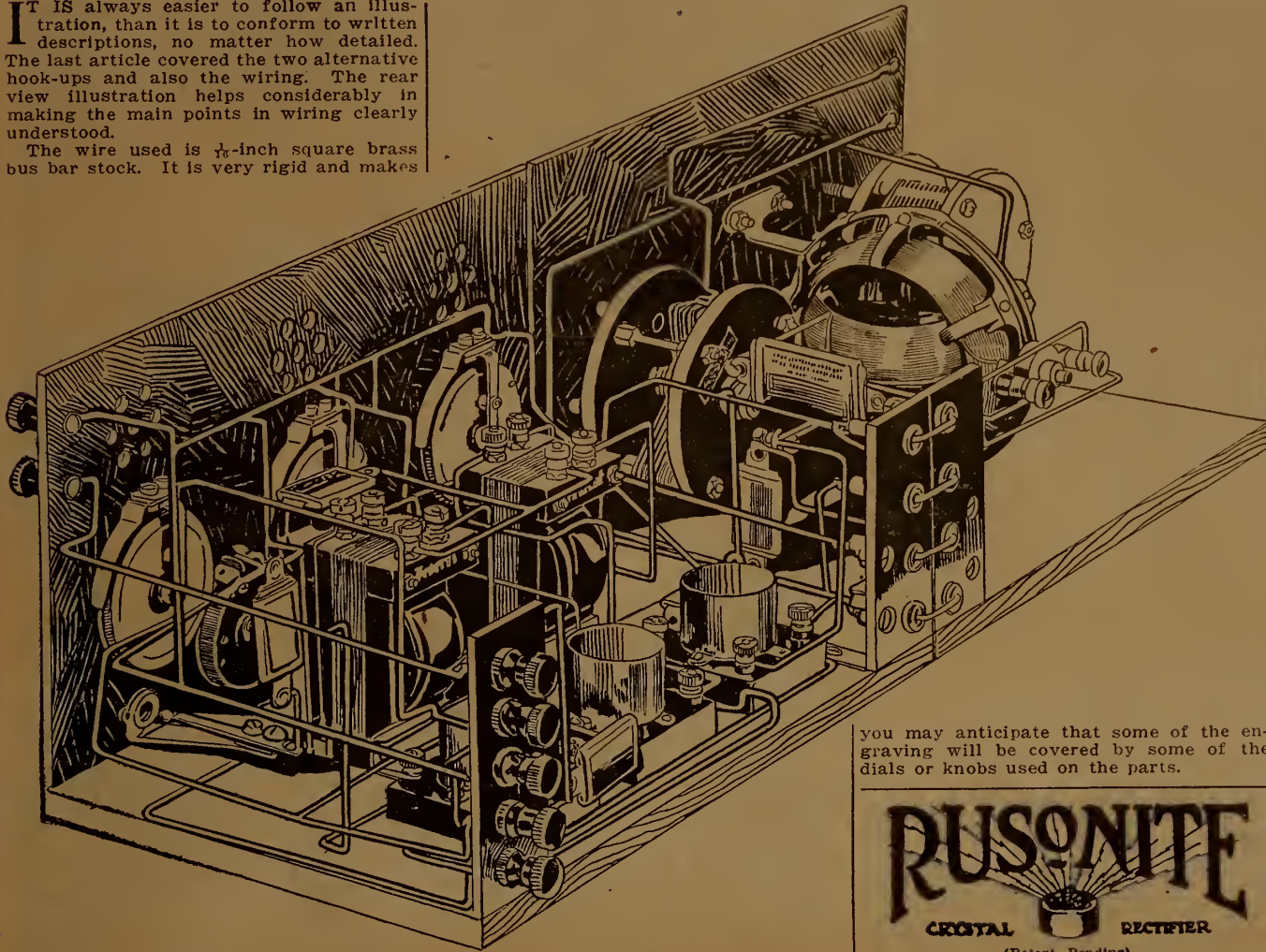
How to Build a Three-Tube Miloplex Receiver

Part IV—Conclusion

By H. J. Marx

IT IS always easier to follow an illustration, than it is to conform to written descriptions, no matter how detailed. The last article covered the two alternative hook-ups and also the wiring. The rear view illustration helps considerably in making the main points in wiring clearly understood.

The wire used is 1/8-inch square brass bus bar stock. It is very rigid and makes



Front View

a decidedly neat-looking job. When the lengths are cleaned with some steel wool, it leaves a rich satin finish. It takes solder well and makes clean and firm joints.

It will be noticed that the potentiometer is marked for positive and negative side on the front of the panel. In assembly, set the slider in back at the halfway point, that is, in the exact center of the wire resistance winding, then put on the knob with its pointer vertical and tighten the setscrews or other locking means used.

Now turn the knob so the pointer is on the positive side. Then the terminal on the potentiometer which is nearest the slider must be connected to the positive A battery and the other terminal to the negative.

The by-pass condensers used in the amplifier circuit are conveniently placed as shown in the illustration. After all soldering has been completed, the circuit should be thoroughly checked and tested for any short circuits. This is often passed over and the fan wonders why it doesn't work.

The view of the front of the two panels shows the abbreviations used in engraving. Engraving improves the appearance of the completed set, but because of its expense, it is advisable to reduce the number of letters and lines to a minimum. In furnishing a layout for an engraving, the locating dimensions for all names and symbols must be given. The engraver does not know what size dials and parts you intend using. If this is neglected,

you may anticipate that some of the engraving will be covered by some of the dials or knobs used on the parts.



CRYSTAL RECTIFIER

(Patent Pending)

THE PERFECT SYNTHETIC CRYSTAL DETECTOR, SENSITIVE OVER ENTIRE SURFACE. No Hunting for "Spots." Loud and Clear. Endorsed by thousands of satisfied users. Sensitiveness Guaranteed. Price, Mounted..... 50c

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NO TAPS NO INTERFERENCE



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Price \$5.00

Indispensable for Construction of Radio Sets

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Serves as the main tuning device for all regenerative circuits, reflex circuits and the Horne "Combined tuned radio frequency and reflex" circuits.

Other units for Reinartz, Cockaday, Flewelling and other circuits.

Booklets of 14 circuits free with each device. At your dealer or postpaid on receipt of purchase price. Write for leaflet.

HORNE ELECTRIC & MFG. CO. Mercer & Colgate Sts. Jersey City, N. J.

The little vernier adjusters are added after the apparatus has been assembled, as their locations depend entirely upon the dials.

As shown in the rear view, the two units are connected by means of four straps in the adjacent sets of connection jacks.

The battery binding posts on the left side of the rear of the second panel are marked as follows, starting from the top: B + Amp.; B + Det.; B -; A +; and A -.

No details are given covering any cabinets. This size of panel is standard and cabinets can be purchased at very reasonable prices. When putting the set into the cabinet, the binding posts should project in the rear.

The connections from the one unit to the other can be made with flexible leads. The small single circuit plugs that can be purchased with the connection jacks will be found very convenient.

Tuning

There are three controls that work in conjunction with one another. These are the detector rheostat, the variable grid leak and the potentiometer. Never advance the detector rheostat to its maximum position unless the batteries are low.

(Continued on page 20)

DUPONT PYRALIN SHELSTONE

Loud Speaker

With

Nath. Baldwin Head Set Type C Perfect Results



Shelstone is made of Dupont's Pyralin, is transparent and one of the most attractive Loud Speakers on the market.

It is built differently to take advantage of the most correct acoustic principles and reproduces music and speech with a clear tone.

Loud Speaker with phones .. \$15.00

Loud Speaker postpaid 3.00

Satisfaction guaranteed. C. O. D. or cash with order. Dealers write for discounts.

THE SHELSTONE COMPANY 185 Clinton Avenue NEWARK, N. J.

KELLOGG RECEIVERS



Very light!

flexible and easily adjusted

Mother, granny and little Willie who hangs on to his end until he is gently guided to bed by the ear—even Dad himself stays until the furnace fire is low and the house is as silent as a morgue—they all appreciate this dandy little head set with wide receiving range and unusual sensitiveness because it is so light and easy on the ears. Not hard to take at all! Band is especially adaptable; receivers are instantly adjustable. Dispense with your "heavy artillery" and get this light, flexible, easily adjustable Kellogg head set. The price? Oh, \$10.00, but don't worry about that if you are after better results.

Use—Is the Test

KELLOGG SWITCHBOARD & SUPPLY COMPANY CHICAGO



The B-T Vernier \$5.00 Tuner (3-circuit coupler)

has revolutionized many of the best circuits. Replaces coils on Reinartz Ultra Audion circuits, etc. Improves R. F. and Reflex circuits. Connections made to binding posts; easily changed to any circuit.

Before Starting Your New Radio Set

—read B-T's new booklet, "Better Tuning." It tells you why—the photo diagrams show you how. It is the result of thousands of inquiries we have had from both beginners and seasoned radio men. Sent on receipt of 10c or free with each Tuner.

BREMER-TULLY MFG. CO. 532 S. Canal St. CHICAGO

Better Tuning B-T

Price 10c



METALECTRIC SOLDERING IRON

Indestructible All-Metal Quality Instrument—"GUARANTEED"

Designed to meet the requirements of the discriminating assembler.

Interchangeable Tip

\$5.50

"WORTH IT"

Operates with the simplicity—comfort—ease and efficiency of a pen.

Of your dealer or write

Post Electric Co., Mfrs. (Dept. 509) 30 East 42nd St. NEW YORK

THREE TUBE MILOPLEX

(Continued from page 19)

There is no necessity of using maximum current.

Set the detector rheostat about three-fourths of the way. Further experimenting with the set may even indicate that this much isn't necessary.

adjustment of the first three controls for improvement.

In tuning in for long-distance reception, the writer has found it advantageous to plug in on one stage of audio amplification. If tuning is done on the detector stage, the change from the phone impedance to the transformer primary im-

Difficulties of Litz Wire

Litzendraht, usually called "litz," is recommended for winding coils, but only if the strands are perfect. The high frequency resistance of a coil wound with perfect litz is much less than for one wound with solid wire, but if some strands are broken or imperfect (and it is very



Set the grid leak about halfway and turn the potentiometer knob until the soft purring of a properly acting tube is heard. If a hum or roar is heard, readjust the grid leak until it is eliminated. The last two controls must be adjusted together until proper action of the tube is attained.

Now set the variometer dial at halfway; that is, with the rotating coils at right angles to the fixed coils. Set the OSC. COND. dial halfway, and very slowly turn the PRI. COND. dial. It may be necessary to reset the coupling and OSC. COND. dials slightly.

When reception is heard, use the verniers for best adjustment of each of the last three controls. Then go over the

pedance unbalances the circuit, and the set must be retuned. Don't turn the amplifier rheostats any higher than necessary. The best point of operation is never maximum unless the batteries are low.

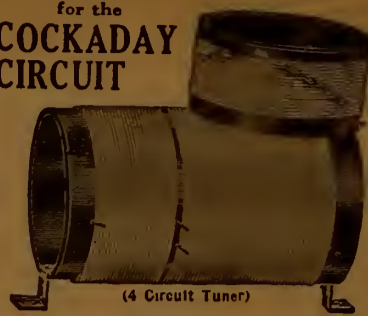
And, finally, don't worry about Radio frequency if your set is going good.

(THE END.)

difficult to wind a coil by hand without injuring some of the strands) the good effect of the litz is totally lost. Besides, soldering taps on litz is difficult and should therefore not be attempted by beginners.

EASTERN COIL SETS

for the COCKADAY CIRCUIT



are now a standard, and in universal use, due to their efficiency in this wonder circuit. Made as per specifications of Mr. Cockaday, using No. 18 wire with D coil bank-wound

Complete Assembled Set of B, C and D Coils..... \$2.75

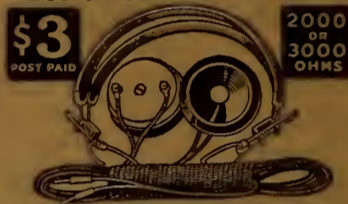
Hook-up directions and material list furnished free with each set of coils.

Mail Orders Filled. Dealers Communicate

EASTERN RADIO MFG. CO.
22 Warren Street, Dept. R. D., NEW YORK, N. Y.

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Tone Tested Radio Headsets

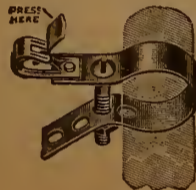


The lowest-priced first quality headset on the market today. Compare with headsets costing twice our price. Return ours if not satisfied. Our written guarantee protects you. Send \$3.00 by registered mail or money order. Buy direct of us and save the difference. We ship, postage prepaid, same day order is received. Ask for our

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Improved Ground Clamp



Equipped with Fahnestock Patent Wire Connectors Easily Attached No Soldering. For Radio Use Only

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Increases the Efficiency of Your Crystal Set



FINER tuning, clearest possible reception, constant adjustment until you wish to change, then—"A Twist of the Wrist—It's Set." Excellent for reflex and other circuits. Write for folder and name of your nearest dealer. \$2

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Genuine Wood Fiber Horn (With Unit and Cord)

Entirely eliminates that annoying metallic sound. Positively the only WOOD FIBER HORN on the market today.

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A Practical Indoor Aerial

Ideal for sharp tuning. Reduces static to a minimum. Contains 600 feet of wire. Instantly collapsible and portable. Can be hung on door or placed under carpet. Noticeable directional effect. Particularly effective in large cities where several stations are broadcasting at the same time. One INDORARIAL used as antenna and another as ground gives interesting results.

At your dealer's, otherwise send purchase price and you will be supplied, postpaid.

ELECTRAD, Inc., 428 L. Broadway, NEW YORK

ELECTRAD INDORARIAL

LEAD-IN Troubles Gone

40¢

Electrad Lead-in fits right under closed window. Can be bent into any shape to fit ledges. Covered with fireproof insulating material which prevents grounding of circuits on wet window sills. Takes the place of ungainly porcelain tubes and holes in the window sash. Always presents a neat appearance. At your dealers, otherwise send purchase price and you will be supplied postpaid.

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NEW YORK

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The Crystal That Brought Joy to 100,000 Radio Users Last Season.

Sent on approval. Pay us when you are satisfied. That's how sure we are that it will please you. Just pass the good news on to a dealer so others may enjoy B-Metals too. Just send us the name of dealer who hasn't heard of B-Metal when remitting. 50c

RADIO CRYSTAL

The B-Metal type C fixed detector for your reflex set—try one and know

Gentlemen—Perhaps you would be interested to know that with the "B-Metal Crystal," which I purchased of you recently, I have received the past few days on an ordinary home made receiving set, without amplification of any kind, the following stations: WGY, Schenectady, N. Y.; KDKA, Pittsburgh, Pa.; WSW & WSAI of Cincinnati; WDAP, Chicago; WJAZ, Chicago; WOAW, Omaha, Neb.; WOS, Jefferson City, Mo. Williamsburg is 30 miles southeast of Cincinnati. This certainly speaks well for your crystal. Very truly yours, GILBERT RAZALL.

B-METAL REFINING COMPANY
3134 Trumbull Avenue, Detroit, Mich.
Chicago Branch, 53 West Jackson Blvd.

LOUD TALKING REFLEX DETECTOR

PERFECTION

MAKE PERFECTION YOUR SELECTION

DR. SEIBT PHONES Made in Germany. 6000 Ohms. The World's best Phones. \$18.00 List. Special.....	\$6.50	Atlas Loud Speaker—New Type. A loud speaker beyond compare. Adjustable tone. List \$25.00. Special.....	\$18.50
Brandes Phones. Superior.....	\$4.95	Amertran Transformers. List \$7.00. None better made.....	\$3.75
Reinartz. Complete parts for one tube set.....	\$10.50	Neutrodyne. Complete parts for 5 tube set. Exceptional value.....	\$32.50

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208 page complete Radio catalogue free with order of \$5.00 on request. Otherwise prepaid for 25 cents

R. F. Applied to Reinartz Receiving Set

Amplification in Front of the Coil in the Set

I built a Reinartz three-tube set about a year ago and have had exceptionally good luck with it, having heard over 150 stations. I received 45 stations within 4 1/2 hours. I have tried all the new circuits including Flewelling, four-circuit and Neutrodyne, but I believe I have one now that is a good one. It is nothing

WORKSHOP KINKS? EARN A DOLLAR—

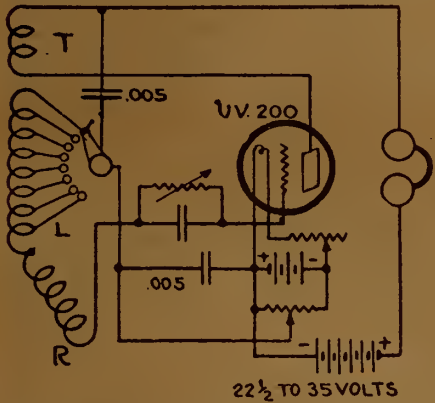
THERE are many little kinks worked out at home that would aid your fellow Radio worker if only he knew about them. There are new hook-ups, new ways of making parts and various unique ways of operating sets that are discovered every day. Radio Digest is very much interested in obtaining such material. Send them in with full details, including stamped envelope, so rejected copy may be returned. The work must be entirely original, not copied.

RADIO KINKS DEPARTMENT,
Radio Digest,
123 W. Madison St., Chicago

more or less than the Reinartz circuit with a few changes and with one step of tuned Radio frequency ahead of the detector tube. This may not be new, but I have never seen it before. A diagram of it is shown herewith. It cuts out a great deal of static and certainly brings them in day and night.—R. J. Bennte, Burlington, Vt.

Two Super Circuits

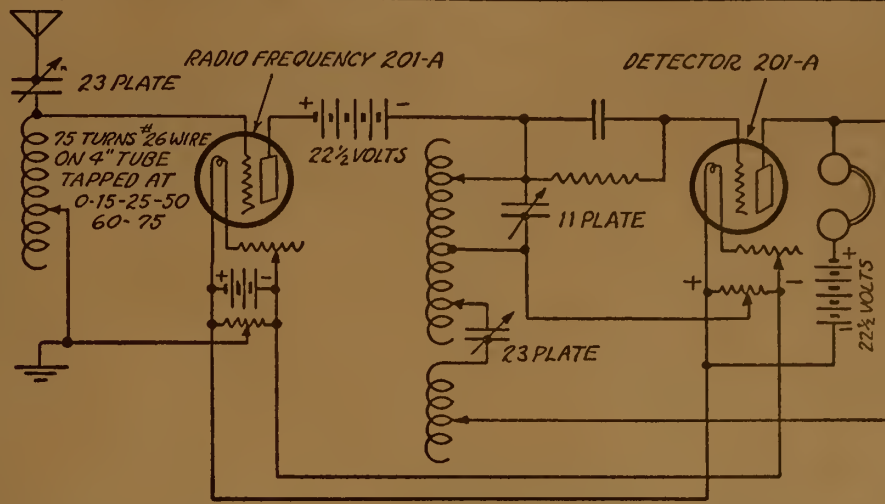
Two super circuits are shown here which give pretty good results when they are adjusted right. The first seems to



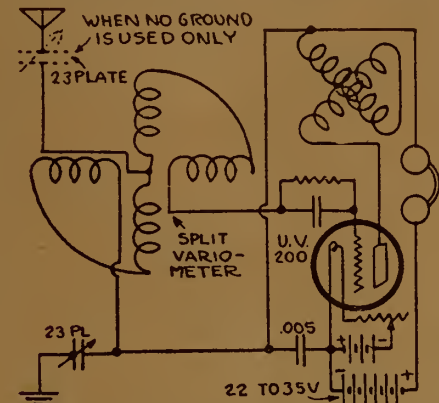
work best without antenna or ground; the second works with either, or both. In the second it does not seem to make any difference whether the plate variometer is in inductive relation to the grid variometer; nor does the grid leak seem critical.

If no ground is used, put a 23-plate condenser in the antenna line, as shown by the dotted lines. The value of T is 75 turns of number 22 d.c.c. on the ball L,

SEVENTY TURNS OF WIRE ON TUBE



100 turns of 22 d.c.c. on a 4 1/4-inch tube. Five taps are used at every 20 turns.



Twenty-five turns are used on R, the coupler ball.—T. R. Goldsborough, Washington, D. C.

Insulate Lead-In

It is always good practice in bringing a lead-in into the house not to let it touch anything. If the lead-in touches any metal, some of the signal strength will be absorbed. In some cases where the lead-in touches wood there is not much difference in the signals; however, when it rains the wood has the same effect as a metal object.

WANTED—Radio Sales Engineers to call on highest grade jobbers and dealers for well known manufacturer, introducing new Grimes Inverse Duplex Single Control Radio Receiving Set. Write for appointment for interview with District Manager. Address B-100, Radio Digest, Chicago.

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RECEIVER A Real One Tube Set

made of best material throughout. Mounted in high-grade mahogany-finished hinged-top Cabinet (as shown above).

FULLY GUARANTEED
Wonderful Distance reported by Enthusiastic Owners
Will Ship C. O. D.; postage paid east of Rocky Mountains

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To the Man Who Builds His Own: Write for our "BULLETIN OF RADIO PARTS AT BARGAIN PRICES." Standard Goods Only.
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WE REPAIR YOUR VACUUM TUBES

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C-301-A	\$3.50 each
UV-200, C-300	2.75 each
UV-201, C-301	3.00 each
DV-6, DV-6-A	3.50 each

ALL WORK FULLY GUARANTEED
Quick Service—Repaired Tubes shipped C. O. D.

NEW TUBES
A-399 (Type UV-199) \$4.10
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All the above Tubes guaranteed amplifiers and detectors. Shipped C. O. D., postage prepaid.

Abalene Radio 14 Vesey Street NEW YORK CITY

Process of Tuning In Regenerative Circuits

In tuning a circuit of the regenerative type with tickler coil, the filament current should first be adjusted to a point below the normal filament brilliancy. The primary and secondary circuits are then adjusted to a condition of resonance with the incoming wave; the proper amount of regeneration is obtained by regulating the coupling between the tickler coil and the secondary. The filament current is next increased, by gradually reducing the amount of resistance in the circuit to the point where signals come in loudly and clearly without howling or distortion. Under this condition the local oscillations have the same frequency as the oscillations radiated from the broadcasting station. It is a condition known as "zero beat," due to the fact that there is no frequency difference, consequently no beat note.

If the tuning is slowly varied either way from this condition of synchronism a high-pitched whistling note will be heard, gradually falling in pitch until it is replaced by the speech or music. Further change causes a low whistling note, gradually rising to a shrill whistling sound. It is thus apparent that the tuning adjustments in a regenerative circuit are so critical it will be found advisable to provide vernier condensers and vernier rheostats. These permit very small changes in the tuning of the circuit and in the regulation of filament current, so that the point of maximum signal amplification may be easily obtained and the sounds received will be free of distorting effects.—Peter J. M. Clute, Schenectady, N. Y.

A three-plate vernier condenser should be connected in shunt to a larger one and not in series.

How to Prevent Howling

Shield the back of the panel with a thin sheet of tinfoil or metal, soldering a connection with it to the ground. Every joint in the wiring should be soldered. Make sure that the switch points and arms are not loose. Much unnecessary noise may be eliminated in this manner. Radio sets may sometimes be kept from howling by placing the plate and grid leak wires as far apart as possible. It is also advisable to plan the wiring so as to be sure that the smallest amount of wire is used in connecting the parts.

Solder Flux for Taps

Never use acid paste as the flux for soldering taps to coils. When heated the paste will flow between the turns, penetrate the insulation and form a high frequency leak between the turns. In many cases it has short-circuited the turns. Use rosin core solder throughout.

Another Scoop Niloplex

Genuine parts as recommended by the inventor including the now

Famous SPLIT VARIOMETER

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We are the largest exclusive radio jobbers in the middle west.

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Audio Frequency Transformer
\$2.50 
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KEYSTONE RADIO LIGHTNING ARRESTERS
\$2.00  \$2.00
Should be on every aerial the year 'round. Provides highly efficient lightning and static protection for the home. Fully approved by Fire Underwriters. Can be installed outdoors. Has no vacuum to lose. Install one in your aerial lead now—be safe.
This pioneer radio arrester is backed by 31 years' experience in lightning arrester design.
For sale by Dealers everywhere, or sent postpaid for \$2.00. Write for circular.
Electric Service Supplies Co.
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TRIGGER OF NEW YORK RADIO

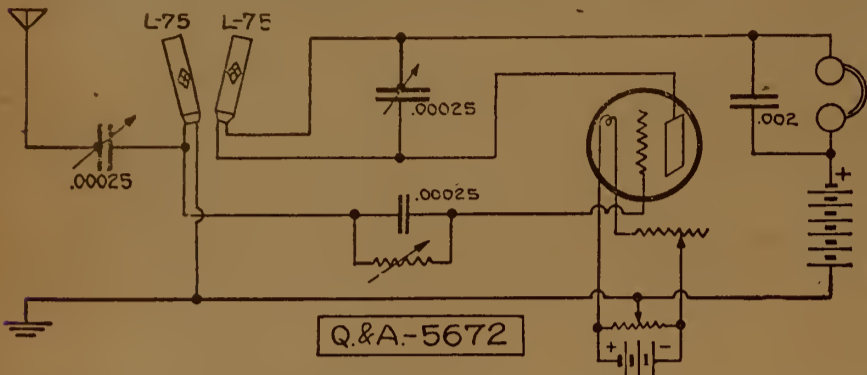
EVERYTHING SOLD ON MONEY-BACK GUARANTEE. WE HANDLE NO BOOTLEG MERCHANDISE.

COCKADAY COMPLETE PARTS GUARANTEED \$12.50 ASSEMBLED \$17.50 Add \$2.50 to each for Cabinet	ERLA REFLEX 3 TUBE BEST OF PARTS \$45.00 ASSEMBLED \$67.50	COCKADAY 3 TUBE Unassembled \$32.50 INCLUDE CABINET ASSEMBLED \$42.50 DISTANCE VOLUME SELECTIVITY	LOUD SPEAKER Bristol 20.00 Atlas 18.00 Magnavox 30.00 Mercury 6.00 Music Master 26.00
Indoor Aerial \$1.75 Hydrometer50 Voltmeter, 50 Volts 1.65 Freshman Variable Grid and Leak70 Remler Moulded Variometer 4.00 Freed-Eisemann 180° Coupler 2.00	Baldwin's Original \$8.50 Jefferson Transformer 2.75 American Transformer 5.50 Acme Transformer 3.75 Wave Trap 7.00 D. C. Charger 5.75	We carry a complete line—from screws to sets. You can purchase with an absolute guarantee. We carry no factory seconds or salvage merchandise. Goods shipped immediately. Please be sure to include postage on orders under \$10.00.	

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Questions and Answers

Honeycomb Miloplex
(5672) W.A.W., Ottawa, Can.
Please publish a Miloplex Number 3 hook-up, using two honeycomb coils, and give number of turns on each.
A.—The hook-up of the Miloplex using



honeycomb coils is presented. Four coils, two of 50 turns and two of 75, should be kept on hand and interchanged for best results.

Antenna

(5090) F.W.S., Chicago, Ill.
Will you kindly answer through Radio Digest if a loop type antenna of 125 feet

against the single strand wire being the presentation of loop faces to direction of current impact with resulting cutting out of local stuff when fishing for outside, on nights other than Monday. If yes—how far apart should the wires be spaced?

A.—Answering your inquiry we are advising that the antenna system of your description would not afford nearly so good long range reception as is possible with a single wire of 125 feet. However, it is admittedly advantageous where increased selectivity is desired. Spacing of wire at 1 inch will serve in constructing loop.

Reflex Circuit

(5207) E.A.S., Cincinnati, Ohio.
I would like to ask you a few questions about the Reflex hook-up. Could I use a tube detector instead of a crystal? Also, could I use a 10 to 1 and 4 to 1 transformer for the audio frequency? Would a Crosley Radio frequency amplifying tuner be good for the Radio frequency?
At present I have a single circuit regenerative detector with two step audio frequency, and I want to make it more powerful for this winter. Would one step Radio and two audio give better results than my present set?

A.—Answering your inquiry with reference to Reflex circuit, we are advising that a tube may be substituted for crystal detector, although no material advantage will be gained. A diagram showing connections appears on page 11 of April 21 issue of Radio Digest.

Transformers of low ratio are indicated for Reflex circuits. Ten to one ratio is rather high. Those of 5 or 3 to 1 are recommended.

The addition of one stage of Radio frequency amplification to your regenerative circuit would not be of sufficient value to warrant the trouble.

Don't expect a Radio set to act like a phonograph, you can't push a button and get grand opera or jazz.

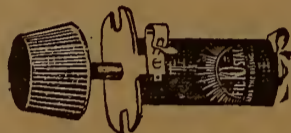


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WD-11 and WD-12 Tubes Repaired

WD-11 or WD-12	\$3.50
C-300 or UV-200	2.75
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C-301A or UV-201A	3.50
Moorehead Detectors	2.75
Moorehead Amplifiers	3.00
DV-6 or DV-6A	3.00
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All tubes guaranteed to work like new
Mail Orders Given Prompt Attention
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MISSING WHAT YOU GET

YOUR set is probably bringing in DX stations you never hear because your rheostat cannot control your filament action. The Fil-Ko-Stat gives infinite adjustment and enables you to magnify the weak stations and bring them in strong and clear.

Full resistance 30 Ohms, adjusted to \$2 At All Dealers in High Grade RADIO SUPPLIES.
"Avoid the use of inferior powdered carbon rheostats."

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Crosley Model X-J \$65

DISPEL dull care during the fall and winter evenings with a Crosley Model X-J radio receiver. Enjoy, nightly, the concerts, speeches and other amusements that are sent out from New York, Honolulu, Cuba, Cincinnati and hundreds of other places.

For bringing in distant stations clearly and distinctly, no set can excel a Crosley Model X-J. It is a 4 tube radio frequency set, combining one stage of tuned radio frequency amplification, detector and two stages of audio frequency amplification.

Actual tests have proven it the most remarkable radio receiver ever offered regardless of price. See this beautiful instrument at your dealers. Complete catalog describing the entire Crosley line of instruments and parts will be sent free upon request.

Write for It Today.

Crosley Manufacturing Company
POWEL CROSLLEY, Jr., President
11494 Alfred St., Cincinnati, Ohio

AID FOR ABI

Gentlemen:
Referring to Q. & A. department, Number 4832, October 20, ABI, Syracuse, N. Y., I will say that if he swaps the leads on his grid variometer he will lessen the body capacity to such an extent that it will not bother him. He may have to experiment with the plate variometer. However, if he changes the lead from the variometer to the same lead on the variocoupler and grounds the filament lead from the variocoupler, he will eliminate practically all body capacity.
At least the foregoing filled the bill for me and my set was in the same predicament as ABI says his set was.
Hoping this is worth something, as I want to try and repay as much as I can your kindness and courtesy in giving me some valuable help recently, I am,
Yours very truly,
H. B. Allen.

stranded number 14 copper wire on the four outsides of a square, say 6 feet long, is as efficient as a single span wire 125 feet long? I am figuring the loop antenna to be fifteen feet or more above the roof and variable as to its faces, same as in interior loop, the object in this type as

REINARTZ COILS

IMPROVED COILS MADE TO COVER NEW WAVE LENGTHS

- 21 tap coils \$1.00
- 16 tap coils90

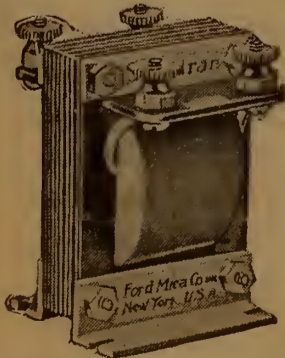
Above prices include coil mounting and also circuit diagram. Sent postpaid upon receipt of money order.

Attractive discounts to dealers.

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An Audio Frequency Amplifying Transformer that does more than meet requirements.



Affords highest amplification on all wave lengths. Built to operate equally well with all modern types of tubes.

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At your dealer's or by mail on receipt of purchase price. Write for free literature.

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NEW 15 POINT

Inductance Switch



Only one hole to drill; easy to install. Pigtail connection eliminates sliding contacts. Westinghouse "Mica" insulation prevents leakage. Solder terminal and contact one piece. New type dial knob eliminates panel numbering.

Can be used as "B" Battery tap switch. Adjustable stop pin.

Ask your dealer—Write for Catalog, complete line.



A NEW DISCOVERY!

EXTREME SUPER-REGENERATION is obtained without noises through **FRESHMAN**

Variable Resistance Leaks

by connecting between plate and Grid of the tube as disclosed by the sensational **New Kaufman Circuit No. 2**



Only the Knob Shows on the Panel

Panel Type

Absolutely No Pencil Markings



Base Type

Freshman Resistance Leaks are especially built for use as tuning instruments. Construction is such that they will withstand unusual usage. Freshman Leaks give an unbroken range of 180 degrees from 0 to 10 megohms. Absolutely guaranteed. Enables you to get stations you never heard before.

EITHER TYPE

Complete with either .00025 or .005 mfd. Mica Condenser \$1.00

Without Condenser 75c

At your dealers—otherwise send purchase price and you will be supplied postpaid.

Ask your dealer or write direct for free diagram showing how you can convert your single tube circuit into the new sensational Kaufman Circuit No. 2.

Chas. Freshman Co. Inc.
Radio Condenser Products
106 SEVENTH AVE. NEW YORK

Every Radio Fan Should Have This Book

LIKE a little radio encyclopedia, this I. C. S. Radio Handbook is packed with concise, sound information useful to everybody from beginner to veteran hard-boiled owl. It starts with simple explanations of radio phenomena and leads you along gently until you can understand the most technical diagram.

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A pocket course in radio! Every page tells you something useful, and there are 514 pages; hundreds of illustrations and diagrams. It is the biggest dollar's worth in radio, and will save you from wasting money on things that don't work.

Send \$1 to-day and get this 514-page I. C. S. Radio Handbook before you spend another cent on parts. Money back if not satisfied

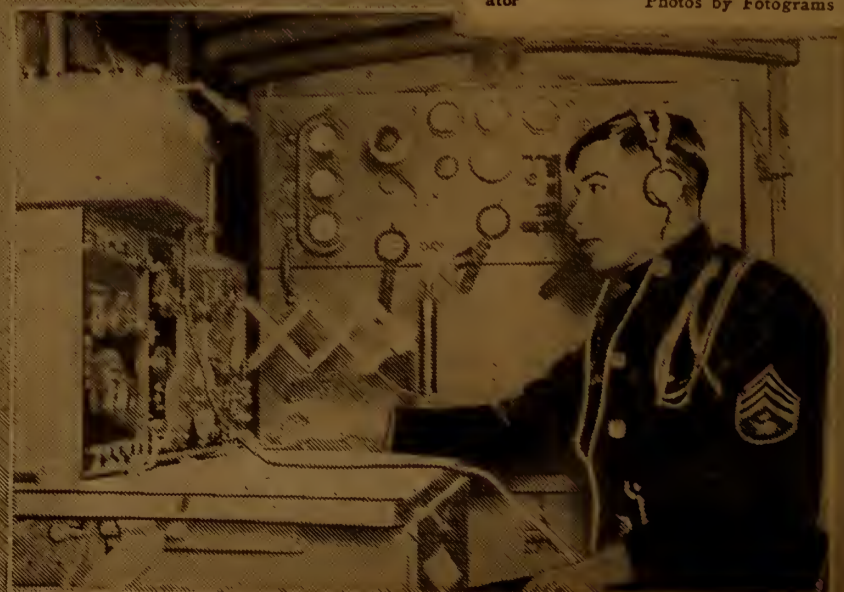
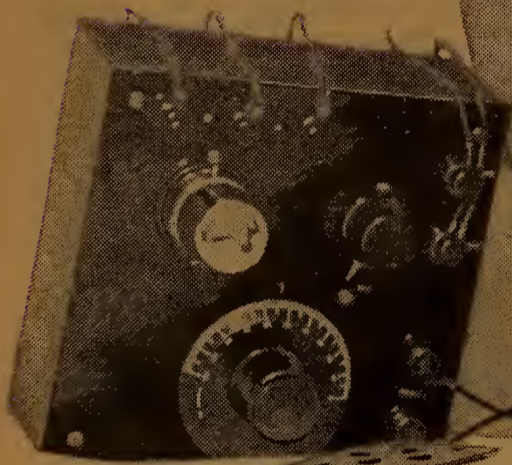
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Box 8279-C, Scranton, Penna.

I enclose One Dollar. Please send me—postpaid—the 514-page I. C. S. Radio Handbook. It is understood that if I am not entirely satisfied I may return this book within five days and you will refund my money.

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Address _____

Radio Illustrated



Above: Rain or shine, this enthusiastic German goes to the house top to catch all he can of the air messages. Left: Playing solitaire while listening to an evening concert, is she? Maybe, but she has the Queen of Hearts in her hand, and it is more likely she is wondering who is to be the king of her own heart. Left © Photonews Above, Int. Newsreel Photo

Below, left: Being both a hunting and a Radio fan, this young lady satisfies both her hobbies by bringing her portable set with her wherever she goes—to the woods, the traps or the blind. Right, one of the U. S. Signal Corps' Radio trucks that carries complete sets for sending and receiving, and its operator. Photos by Fotograms