

# HELP HOOVER FIX WAVES

## 'HIRED HAND' COMES BACK TO WBAP MIKE

LISTENERS AND THE BOSS WON'T LET HIM QUIT

Famous Texan Returns from Beach Sojourn with Denial That He Ever Suggested Resigning

FORT WORTH, Texas.—"Entry! Entry! The Hired Hand is back on the job!" Radio fans throughout the country have reason to be glad again with the return of the Hired Hand, popular substitute announcer of WBAP, the Fort Worth Star-Telegram. His absence from the microphone lasted only one week. He claims now that his boss is responsible for inducing him again on the radio.

(Continued on page 2)



## RADIO'S HEAD WISHES DATA FROM PEOPLE

Would Remedy Tangle

Radio Digest Publishes Blank to Secure Information for the House and Senate

WASHINGTON.—Secretary Hoover calls for the opinions of Radio listeners! He is powerless to regulate broadcasting despite all the existing chaos, and he seeks to know what the majority of broadcast listeners want.

His recent appeal, made in desperation because the old 1935 law does not give him authority to refuse licenses for new stations or to suspend programs, must be answered.

The future of broadcasting rests in the hands of the listeners who rally to the aid of Mr. Hoover. He wants to know many things. When he knows these things he can present a clear case to congress, so that immediate action can be secured.

Radio Digest in its war upon the creation of further air congestion by the opening of more class B broadcasting stations, announces that it will help collect and tabulate the information desired by Mr. Hoover.

It will print a voting blank, a copy of which appears on page three. If more blanks are desired they may be secured by writing Radio Digest.

The purpose of the blanks is to answer a number of questions for Mr. Hoover and congress. The answers given will be a

(Continued on page 2)



Left, "Florida the Flipper," The Cincinnati Post Girls' mystery girl at Crosby W.W. Above, Ruth Kallenberg, regular soloist and entertainer, who is frequently heard from KFAR, Lincoln, Neb. Right, Marie Balch, pianist of the Texas Christian university school of music, who was heard this week at Station WBAP. She is a pianist of national fame.

## FAN WANTS A WIFE; CAN ANYONE HELP?

DENVER.—Wanted—one wife. I live in Hamburg, N. D., and want to hear from some lady who wants to be married," declares a listener in a lengthy letter to Station KOA, the General Electric company, at Denver. "Maybe some lady wants to go in the marriage business with me, so let her send me a letter." The correspondent stipulates that applicants must be of "young years."

## Station KFDM to Broadcast Beaumont Music Festival

BEAUMONT, Texas.—A program will be broadcast from KFDM, Magnolia Petroleum company station here, every night during music week in Beaumont, from April 26 to May 2 inclusive.

This will include on Sunday night, April 26, a sacred concert at 9:30 p. m., Central time, and Friday night a children's program from 7 to 7:30 p. m., and at 8 p. m., a concert by the Magnolia Redners band.

April 27, 28, 29, 30 and May 1, at 9:30 p. m., special programs will be given by the Messer Violin choir, under the direction of Miss Gladys Harned, the Beaumont High School orchestra, local musicians and visiting artists, who will be in Beaumont for the Texas Federation of Music Clubs convention, held in the city during the week.

## Form Sutter-Yuba Club

YUBA, CITY, Calif.—Radio fans of Sutter and Yuba counties have organized a Radio club here for the purpose of increasing further interest in the new science. The club will be known as the Sutter-Yuba Radio club.





# KYW DANCE LESSON HELP FOR CHILDREN

## STATION GIVES REGULAR BALLET INSTRUCTION

Each Saturday Boris Petroff Teaches Steps with Help of Pictures in Daily Paper

CHICAGO.—Now the little children—especially the pretty little girls who want to acquire grace—can take their dancing lessons every week in their own home. The loud speaker will be their teacher. Per beginning this month, KYW, the Westinghouse station here, has inaugurated a regular Saturday afternoon ballet dancing lesson. The teacher is Boris Petroff, of the production staff of the Balaban and Katz theaters in Chicago. The lessons begin at 2:30 p. m., Central time (daylight saving after April 26) every Saturday.

On Friday previous to the day the lesson is given, a series of pictures of Dorothy Herka, dancing partner of Mr. Petroff, are published in one of the daily newspapers. The pictures are explained by the article accompanying them, which also instructs those interested to listen in to KYW at 2:30 next day.

Mr. Petroff on the following day, Saturday, uses the pictures then to illustrate his broadcast ballet dancing lesson. The series will continue all summer, it is planned.

Since ballet dancing is the foundation of all dancing the lessons are sure to be beneficial to both those who are studying and about to study any kind of dancing. Mr. Petroff is especially suited to instruct. He was formerly a member of the Imperial Russian ballet and has been a teacher of dancing in America for seven years.

# Mrs. Henry Field, of KFNF Fame, Succumbs

## Broadcast Funeral Ceremony to Shenandoah Station's Fans

SHENANDOAH, Iowa.—The audience of KFNF is in mourning. Mrs. Henry Field, beloved wife of the proprietor of the popular Shenandoah station, died recently. The funeral services, which were attended by 3,000 people from this and neighboring cities, were broadcast to the world as a fitting tribute to the mother of the Field family, which has been so active for the good of this community.

Thousands of letters of condolence poured in from listeners who heard of Mrs. Field's untimely death. A movement has been started among Radio friends to purchase a pipe organ and present it to Station KFNF as a memorial to Mrs. Field.

# HOOVER WANTS HELP

(Continued from page 1) large measure be responsible for the future of broadcasting.

Radio Digest appeals to Radio listeners to fill in the blank on page three and mail it at once to Radio Digest, 510 N. Dearborn street, Chicago. Ask for more blanks if you want them.

**Cause of Air Congestion**  
Lack of legislation and funds to administer present legislation is the cause, as explained previously by this publication, for the terrific jamming, heterodyning, and crowded condition of the ether. Radio broadcasting is at the crisis. Some action must be taken, and taken immediately, if conditions are to get better instead of worse.

The questions asked by the blank on page three will help if enough readers answer them and send them in.

If you don't like broadcasting conditions as they are today send in a blank for yourself and a hundred blanks from your friends. Then you can be sure you have done your duty.

Help Secretary Hoover to get the information he desires!

**Congress Ignorant of Conditions**  
The necessity of helping Mr. Hoover to present his case to congress so that body will pass the required laws and appropriate badly needed funds, is reflected by the small number of members of the senate and the house of representatives that possess Radio sets and know enough about Radio to tune them.

The number of these legislators is but 100, and of this 100 only a few enthusiastic ones exist.

Hence the need of telling congress what it's all about. Their lack of information is appalling, and represents a crying need for immediate action.

Fill the blank at the bottom of page three and help relieve the congestion of the air. DON'T FAIL! Do it today, and send for more blanks if you want them.

# TURN SHIP'S CABIN INTO RADIO STUDIO

NEW YORK.—In order to enable Radiophans to hear Marie Ivo-gun, internationally famous opera and concert singer, before she left the United States for Europe, Station WJZ ran a remote control line aboard the ship on which she was sailing. The suite she occupied aboard the S. S. Homeric was transformed into a small studio less than two hours before sailing time. This was her first and only appearance before the microphone.

# WINDSOR CASTLE TO HAVE NO RECEIVERS

LONDON, England.—Although King George listens to regularly on his own personal Radio set at Buckingham Palace, he will permit no aerials to find a place on the battlements of his other residence, Windsor Castle. The castle is the home of numerous distinguished permanent guests of his majesty. Several of them have sought permission to install sets there, but have met with a polite refusal.

# JUST "EVERYDAY GEORGIA FOLKS"



CONSIDERABLY less than a year ago Mr. and Mrs. Edwin McConnell were doing rather nicely as gospel song leaders at Baptist revivals here and there. Today Ed and Grace McConnell are as familiar to the Radio millions as Bobbie Jones is in his sphere. The two "Everyday Georgia Folks," as they aptly styled themselves, brought to the Radio world, through WSB, something entirely new in the history of broadcasting.

They tried the virtually unprecedented innovation of being natural—of letting human nature, unconventionality, spontaneous humor and unforced cheerfulness do the work—and got away with it.

Ed is a Georgian, born and reared, and is just as big and cumbersome and informal in person as he is on the air. He gets as much fun out of a broadcast as the audience does, and probably more. He is the son of the noted Georgia evangelist, Dr. Lincoln McConnell. Ed has

written a number of gospel songs and popular airs that were hits long before he discovered Radio. He is in the middle thirties, towers considerably over six feet, weighs more than 225 pounds.

Mrs. McConnell, or "Mama," as Ed calls her, is an ideal foil. She is pretty and demure, chic and attractive. Her voice is charming when she sings alone, and it blends perfectly with Ed's when they sing together.

When Ed and Grace put on a broadcast they begin by making the proposition a family party. Ed chats with the audience as confidentially as though he and all his family had been next door neighbors with every listener for decades. Every Saturday night at either the 8 to 9 or the 10 to 11 (Central time), broadcast from WSB, The Atlanta Journal station, the McConnells may be heard, and it is safe to say that their programs always draw the biggest audiences of the week.

# CONCENSUS OF OPINION VOTE

Send to Radio Digest, 510 N. Dearborn Street, Chicago

To be forwarded by Radio Digest to the Department of Commerce for the attention of members of Congress.

- |  |     |    |
|--|-----|----|
| 1. Do you want less class B (500 watts or more power) stations?.....   | Yes | No |
| 2. Shall B stations be reduced to 94 in number, so that they can be accommodated satisfactorily in the "other roadways" now available for the use of broadcasting stations?.....   | Yes | No |
| 3. How far away, approximately, is the nearest class B station?.....   | mi. |    |
| 4. Are you troubled by B stations heterodyning and interfering with one another?.....  | Yes | No |
| 5. Have you read a description of the Kintner plan?.....   | Yes | No |
| 6. Are you in favor of it or some similar plan which will help clear the air of the present "traffic" congestion?.....   | Yes | No |
| 7. Do you favor the appointment of an unbiased, non-partisan broadcasting control board for the settlement of all differences pertaining to broadcasting and the interpretation of present or future Radio legislation?..... | Yes | No |
| 8. Include separately a list of five stations you like most and five you dislike most.   |     |    |

How many members Name .....

in your family?..... Address .....

Are all of the same City, County, State.....

mind as yourself?.....

(Write to Radio Digest if more blanks are desired)

# BIG MUSIC FESTIVAL FROM KOA MAY 3-10

## DENVER MUSIC WEEK PROVIDES GOOD PROGRAM

Many Musical Organizations to Provide Material for Daily and Nightly Broadcasts

DENVER, Colo.—Period music, representative of five eras in the history of musical development—modern, pre-modern, romantic, classical and clavichord—will be one of the daylight attractions of Denver's huge music week festival to be broadcast by KOA, May 3 to 10.

Costumes harmonious with the melodies themselves will be worn for this novel performance, which will be given daily at noon and flashed to the ears of the nation from the Denver municipal auditorium.

Tea-time music, a feature to be provided by a half dozen crack orchestras, will be heard by KOA's guests as a daily afternoon event, as well as three student concerts, which will be broadcast as matinee attractions. A choral and orchestra competition of forty-two entries among high school students representing twenty-seven institutions in thirteen Colorado towns marks the fourth matinee event.

**Plan Big Evening Festivals**  
Orchestra and glee club musicals by ten high schools of Denver comprise the late afternoon programs over KOA's microphones, followed by daily twilight concerts by a group of forty-piece brass bands. These will be open-air features and will be given at Denver's Greek theater.

Details for evening presentations are rapidly taking shape, according to Freeman H. Talbot, program manager of the General Electric station and executive director of the Denver Music Week association.

"We plan to give one evening to popular operatic airs at the KOA studio," he declared. "Among these will be the second act from 'Martha,' the quartet from 'Figlietto,' 'Barcarolle' from 'Tales of Hoffmann,' 'Sextet from Lucia,' 'Toreador Song from 'Carmen,' the 'Aveil Chorus' and 'Miserere' from 'Il Trovatore,' and instrumental medleys from the Gilbert-Sullivan light operas. These numbers will be presented by leading singers participating in the music week festivities."

# EXPERT GOING TO AID MISSIONARIES

## Have Had Receiver for Eighteen Months, But Cannot Make It Work

ST. LOUIS, Mo.—WRE Radio at its present state of perfection, there are still some people who doubt that music can be received from the air. They are people who live in the vicinity of Proctor, Mo. The Clingen sisters, missionaries of the Presbyterian church living at Proctor, eighteen miles from a railroad in the Ozarks, saved enough from their small salaries to buy a receiver. They have had the set for eighteen months, but have not received a sound from it. The natives began to express doubts as to the mental stability of the Clingen sisters.

However, Station WMAF, located in this city, heard of the predicament and recently took up a collection to send Kenneth Flint, a Radio expert, to Proctor, with orders to get the set working. Flint is on his way and is donating his own time.

# Michigan Theater Observes Radio Week; Stars on Bill

LANSING, Mich.—Radio week was observed by a local theater here recently when stars from Chicago and Kansas City stations appeared on the program in conjunction with the regular vaudeville bill. The Radio entertainers were Josephine Van Bergen, pianist and soloist from WJL Chicago; Walter Wilson, KYW's "Uncle Bob"; Lucy Bruch, violinist from WLS, Chicago; Jack Halligan, comedian at KYW; Art Link, comedy songster from KYW, and Bartram and Saxton, singing team from WDAF, Kansas City.

# New British Bill Causes Rush on Licenses by Fans

LONDON, England.—The new British Radio bill has had at least one good effect. It has shown very conclusively that many people do not intend to pay for their Radio programs until they are absolutely forced to do so. As a result of the penalties proposed for such evasions under the new measure, more new Radio licenses have been sold in the last month than during the previous twelve months. The rush took many post office counters. The heavy demands could not be met, the supplies of licenses being exhausted.

You will never know the thrills  
of Radio until you own a

# FRESHMAN MASTERPIECE



The Greatest Value ever  
Offered in a Radio Receiving Set

## 5 tube tuned radio frequency

embodying the 5 big features  
demanded in a perfect receiver

- ☞ Built of only the finest low loss material in a beautiful mahogany cabinet [or soft-toned leatherite];
- ☞ It brings in far distant stations,
- ☞ Night after night at the same points on the dials,
- ☞ With real loudspeaker volume,
- ☞ And full throated, true to life tone.

*Be sure the serial number is riveted on the sub-panel  
It is your protection and guarantee*

**Chas. Freshman Co. Inc.**  
*Radio Receivers and Parts*  
FRESHMAN BUILDING  
240-248 WEST 40TH ST.—NEW YORK, N.Y.

\$ 60

At all  
dealers

# Gold Medal WCCO, Minneapolis-St. Paul



Hitting the high spots in singing at WCCO. From left to right they are: Ted Kline, first tenor; Kenneth Johnson, second tenor; Cal Scheibe, baritone, and Nels Swenson, bass. They are the famous Gold Medal quartet.



Above, Henry A. Bellows, station director. Below, Eleanor Freeman, accompanist at WCCO.



THE Gold Medal station, Minneapolis-St. Paul, WCCO, is on the air with its new 5,000 watt equipment and broadcasting from its new Minneapolis studio on top of the Nicollet hotel. If you doubt this, ask Ray Sweet, chief engineer of WCCO, who has been in bed recuperating from the effects of installing the station. Ask Paul Johnson, announcer, who has hardly been able to speak above a whisper since the five-hour program opening night. Ask any of the four or five thousand Twin City residents who jammed the Nicollet hotel to see the new studios on opening night. In fact, ask any Radio fan from New York to San Francisco, and from Brownsville, Texas, to LaPas, Manitoba. Not satisfied with getting the new transmitter on the air and opening the new studio in Minneapolis, the management of WCCO announces that they will at once begin work on more new studios for St. Paul. These will probably be the most uniquely located of any broadcasting studios in the world. They will be in St. Paul's handsome new Union Depot, used by nine railroads, and where thousands of persons will pass by daily and watch the broadcasts through glass panels.

The construction of the studios proper is unique in that the ceilings are suspended and deadened, the walls insulated, the floor built upon cork, and in addition heavy green velvet drapes are hung from a track running about the walls, thus making possible acoustic control. The reception room and studios are elegantly furnished. On the floor in the reception room and promenade are Oriental rugs, while the studios are covered with extremely heavy padded carpeting. The furniture is all in colors and of a unique type. In fact, the studios have been pronounced by those who have visited broadcasting stations throughout the country to be unequalled in appearance and facilities for proper broad-



Above, Paul Johnson, announcer, ready to strike the gong during the time signals. Below, a corner of the reception room, showing draperies and furniture with a futuristic tinge. This room is located on top of the Nicollet hotel; here the visitors and artists are first greeted.

casting. Henry A. Bellows, well-known magazine editor and musical critic of the Northwest, has just become associated with WCCO as director. He is known throughout the country for his work in magazine circles, and his position of director will entail the work of arranging for all broadcast-

(Turn to page 6)



Visitors at the Minneapolis studios of the Gold Medal station on top of the new Nicollet hotel may view the broadcast through the glass panels.



Left to right, Ray Sweet, chief engineer; Eleanor Peckler, musical program director; Paul Johnson, announcer, and Harry Wilbern, station manager. This is the way they looked after broadcasting for five and one-half hours.

# HOUSE OF COMMONS MAY BE BROADCAST

## ENGLISH PREMIER WOULD FIND OUT FEASIBILITY

Proposal Startles Parliament—Appoint  
Committee to Investigate Question  
—Call in American Experts

LONDON, England.—"Hello, the British Isles. The house of commons speaking." This announcement may soon be heard by millions of British Radio fans. "I think," stated Premier Baldwin recently in parliament, "that the whole question of permitting proceedings in the house to be broadcast by the British Broadcasting company should be considered and for that purpose I am thinking of setting up a select committee of both houses." This announcement took members of parliament completely by surprise and was the topic of discussion throughout the rest of the day.

The B. B. C. is approaching the stage when it may be possible to provide a special wave length which can be allotted to the broadcasting of parliamentary debates. Listeners could then tune in to the house of commons as they tune in to other stations.

The committee suggested by the premier will probably investigate the whole question of the future of broadcasting. It will have the assistance of experts and will be furnished with evidence from the United States.

(Editor's Note.—American broadcast listeners will remember that congress voted down a similar proposition some time ago. It was proposed to broadcast the proceedings of congress, but the members of that body were evidently unfavorably inclined toward letting the public hear the business taking place there.)

### Marion Shut-in Rabid Fan

MARION, Ohio.—Though confined to a wheel chair, Jack Hoagland, 22, of this city, is probably the most rabid Radio fan in this vicinity. Jack makes all his own apparatus and has a log that would make a Radio manufacturer envious. And best of all, people come in to visit Jack regularly nowadays to see his sending and receiving sets, and to learn why their sets won't work properly.

## DO YOU KNOW THESE VOICES?



A photograph that one seldom sees. Three of the best announcers in the country, during the recent Kansas City Radio show. Left to right, Lumbdin Kay, "The Voice of the South," WSB; George Kay, "The Solemn Old Judge," WLS, and Leo Fitzpatrick, "The Merry Old Chief," WDAF.

### Ladies, Tune to WGY for Lesson in Home Economics

SCHENECTADY, N. Y.—An extension course in home economics is open to every woman within range of the voice of WGY. Schenectady station of the General Electric company. Two afternoons each week, Monday and Thursday, at 2 o'clock Eastern time, members of the faculty of the

New York State College of Home Economics, Cornell university, give talks on clothing, house furnishing, nutrition, household management and equipment.

### Charleston to Have Club

CHARLESTON, W. Va.—Local fans in this city are organizing a new Radio club to further the development of Radio. They held a meeting recently at the Y. M. C. A.

## GOLD MEDAL WCCO

(Continued from page 5)

ing programs from the Gold Medal station. "Listen for the time signals," is often heard from this station. The announcer is none other than Paul Johnson, who has endeared himself to the ears of all the fans listening to WCCO.

Next in line comes Eleanor Posheit, musical program director. She has been with WCCO for some time, and the quality of musical programs broadcast, vouch for her ability at picking artists.

On the evening of the opening, invitations were sent out to approximately 5,000 people to come to the Nicolet hotel and view the broadcasts. They began arriving at 7 o'clock in the evening, and continued coming until the program ended at 2:30 a. m. During the evening hours a motion picture photographer would have been able to catch a mob scene equalled in but few productions. Elevators were swamped trying to carry the passengers. Many of the guests walked the twelve flights to get to the studios.

The most noticeable result, according to officials of the Gold Medal station, of the installation of the new equipment is the greatly increased range. Since the new transmitter has been on the air, reception has been reported from both coasts, and on Saturday, March 7, report was received that the noonday market reports had been heard over a loud speaker in the heart of New York city. On the west coast, Radio fans report that the new WCCO comes in with the volume of local stations.

### W. W. Tracy Announcer for WEBW, Beloit, Wis.

BELOIT, Wis.—W. W. Tracy, engineer and globe-trotter, has been appointed official announcer for all Fairbanks-Morse programs broadcast Tuesday evenings from WEBW, Beloit. Mr. Tracy, like all of the other members of the F-M broadcasting staff, is employed in the company shops. He is the chief engineer at Beloit works.

### Quell Super Station Rumor

NEW YORK.—Recent purchase of fifty acres of land by the Radio Corporation of America was denied by company officials as indicating that a super station would be erected. The R. C. A. announced that the land was obtained for short wave experimental work.

## The Finer Side of Radio



A Song  
That  
Reached  
Home

A great baritone sang with uncommon fervor to his enraptured listeners.

The melody seemed to string a golden chain of words for some responsive heart.

It reached ten times a million hearts.

For as the music faded into silence the singer said GOOD NIGHT MOTHER!

And then we knew that song had gone straight and true to someone somewhere in that vast invisible audience.

Someone whose tear-dimmed eye saw not the wonderful singer but a little boy whose tousled head lay on her breast.

And in that spell of mother love which makes millions kin.

All those listening hearts "tuned in" to one heart.

A heart that must have felt the magic of ten million prayers unified in one "God bless her!"

Our Bristol Loud Speaker had given us all the rich tonal quality of the singer's voice, its natural sweetness, its pathos. It had been a wonderful evening.

### 5 MODELS

The Cabinet shown here is of beautifully finished mahogany, 17 x 10 x 10 1/2". It has a full floating wooden horn with four expansion chambers and a high grade electro-magnetic tone reproducer. Price \$28.00. Horn comes from \$12.50 to \$25.00.

Send for Bulletin AY-3023

Ask your dealer to demonstrate them on the Bristol Company's.

THE BRISTOL COMPANY  
Waterbury, Conn.



BRISTOL AUDIOPHONE Loud Speaker

Quality Parts  
Matched for Perfect Teamwork

Your pet "hook-up" needs first quality parts—perfectly matched—to give you real radio.

Every Federal Standard Radio Part is designed, made, matched and guaranteed by Federal. That is why you find Federal parts in all the better hook-ups—that is why you should insist on Federal parts when purchasing.

FEDERAL TELEPHONE MANUFACTURING CORP.  
Buffalo, N. Y.



**Federal**  
Standard RADIO Products

# Operating and Trouble Shooting

For the Owner of Super-Zenith VII, VIII, IX and X

THE panel and apparatus of Super-Zenith VII form the basis around which the other three models in the Zenith line are built so the following data on this set will be found of equal value to the owner of the larger models.

Super-Zenith VII is probably the largest cabinet receiver on the market, as the apparatus has not been crowded together and there are large compartments at each end for the batteries. This set is a tuned radio frequency receiver, incorporating two stages of radio frequency amplification, a detector and three stages of amplification at audio frequencies. Much interest has been aroused in Radio circles in this set as it is the first time that a receiver has appeared for use by the Radio public in which variable coupling in the R. F. transformers has been tried.

The unique and different factors are not all within the cabinet as inspection of figure 1 will show. At the right end of the panel there is an engraved scale which indicates the settings of the pointer Da, which settings are controlled by the knob identified by the letter D. The usual construction is to have a large dial which can be turned by means of a smaller vernier knob, but in this case all control of Da is done through the knob D. The other tuning control is the Indicator Ga and Ja, the setting of which is varied by the knob GJ.

The rear view of this panel is shown in figure 2, and study of this illustration will show the reason for the peculiar identification lettering of the controls. The variable condenser D is on the shaft of the pointer Da, which is adjusted through knob D. Behind knob D on the front of the panel will be found a knurled disc which is the control H, by which the capacity of the small condenser H as shown in the rear view, may be varied. The two condensers G and J in figure 2 are controlled through cords by the knob GJ, the settings for which are shown by the pointer Ga-Ja; thus two condensers are controlled simultaneously by means of a single knob.

Figure 3 is presented for those who are familiar with schematic wiring diagrams, and the various parts used and shown in figure 1 and 2 may be readily found in figure 3. For control of efficiency of the first tube, a variable high resistance unit is inserted in the plate circuit of the first tube and identified by the letter E. M is the rheostat by which the brilliancy of the detector tube can be varied while L is a stage control switch which permits of ready change from one to two or three stages of audio frequency amplification. Considering now figure 3 it will be noted that signals come into the primary of the fixed coupler C and the turns in use in the primary can be varied by means of the different connections to binding post B.

A small loading coil is shown at A, which may be set in or out by the switch identified as A. The secondary of coupler C is tuned by condenser D and from this tuned circuit signals pass to

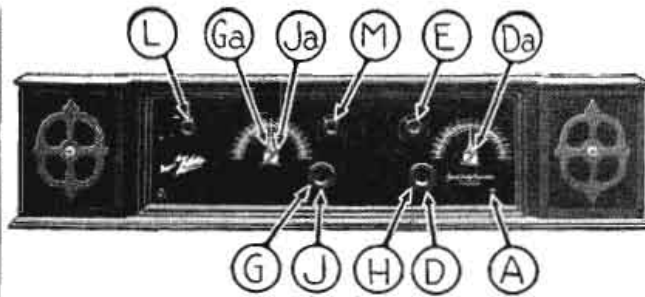


Figure 1

tified in figures 2 and 3 by the letter K. There are no rheostats in this set for any of the amplifier tubes as fixed ballast

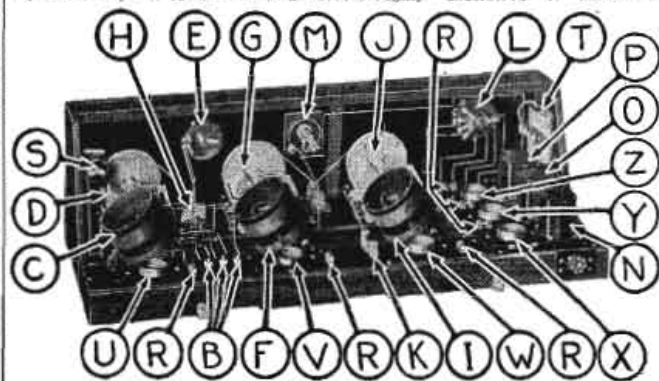


Figure 2

resistances are employed to keep the voltage supplied the filaments of the amplifier tubes at the correct value. The three stages of audio frequency amplification appear at the right end of figure 2, the tube sockets X, Y and Z being the first, second and third stages respectively, while transformers N, O and P are used in that order.

A jack, not shown in figure 3, is furnished, allowing the use of head phones for tuning. The method of changing from phones to loud speaker is entirely automatic, merely removing the phone plug puts the loud speaker into operation, plugging in the phones puts them into operation and disconnects the loud speaker. Switch L is used to increase and decrease the amplification as desired. This is an improvement over the old plug and jack system employed in the majority of other Radio receivers. Until one has become thoroughly accustomed to

turned to the right until a hissing sound is heard, at which point it should be turned back until the sound just disap-

pears. In other words, it should be kept as far to the right as possible without causing distorted signals. The operator can readily recognize this point when a station is tuned in, by turning the control E completely to the right and then bringing it back until a point is reached where the signal is perfectly clear.

To tune, start with D and GJ at zero on their respective scales and the vernier H midway between its left and right hand stopping points. Move GJ slowly to the right and simultaneously swing D pendulumwise to the right, that is, swing it back and forth slowly over a range of three degrees on either side of the position maintained by GJ. The proximity of a station broadcasting at the time, will be indicated by a hissing or rasping sound as D passes a particular point. Adjust GJ and D to the loudest point of the sound, then release D and operate GJ and the vernier knob H simultaneously as follows: Move vernier H slowly back and forth, at the same time moving GJ slowly back and forth over a range about one division on either side of the point where the loudest signals are heard. This should clear up the reception. In the event that it does not, controls GJ and D should be slightly readjusted and the vernier H operated as before. This will bring in the station clearly, and the readings on a log card for future reference. Should it be desired to retune a station at a future time, it is only necessary to place the pointers at the positions on the scales indicated by the log card and then adjust the vernier H.

To get the utmost out of the receiver the following readjustments may be made after the station has been tuned in as outlined above. Turn control E completely to the right and then gradually bring it back to the point where the voice of music clears up. The best suggestion for using this control is to keep it as far as possible to the right without impairing the quality of the program being received.

After a station is tuned in, remove the headphones plug from the jack in the lower left hand corner of the panel, whereupon the signal will be heard in the loud speaker which has been connected to two

(Continued on page 18)

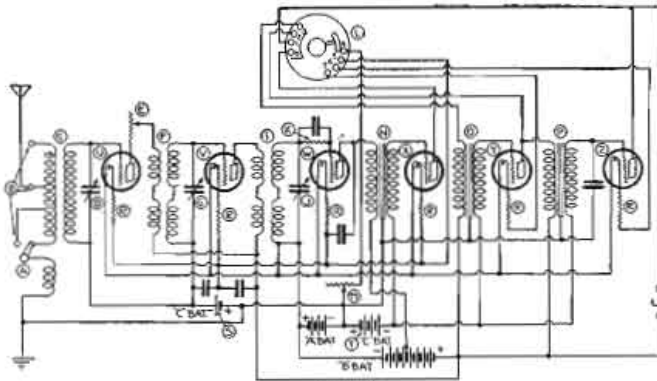
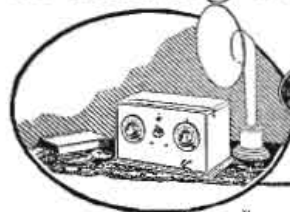


Figure 3

tube U. Tube U is coupled to tube V by means of the tuned R. F. transformer P. The primary of transformer P is attached to the shaft of condenser G and is rotated with respect to the secondary simultaneously with condenser C. Tighter coupling between primary and secondary is possible at higher wave lengths than can be used at lower wave lengths, and this primary is adjusted so that its position approaches a right angle with respect to the secondary as the rotor plates of condenser G are turned out of the stator plates. Signals then go to tube V and then to transformer I in which the same feature of variable coupling is found as is used in transformer P. Transformer I feeds into the detector tube W. The grid leak for this detector tube may be iden-

the set it is suggested that head phones be used in tuning the receiver. After the operator has had sufficient experience in tuning, the majority of stations may be tuned in directly on the loud speaker. Knobs D and GJ are the two tuning controls. By their use the desired station is tuned in. Low wave stations transmitting on 300 to 300 meter waves will be found on the lower left hand side of the scale, stations of higher wave lengths will be found as the pointers are advanced to the right. It will also be noticed that controls D and GJ will have practically the same setting when tuning in a station. For example, if a station is being received with pointer Da at 65 on the scale, Ga-Ja will likewise be at approximately 65.

## Combines best features of leading circuits

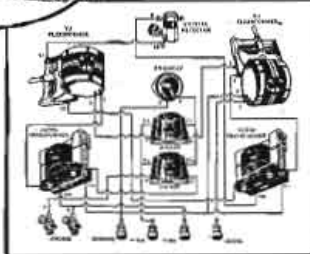


Licensed under U. S. Patent Office Patent No. 719,284 for Radio Receiver Systems.

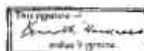
PRICE, COMPLETE

\$35

Unequaled Distance and Volume  
+  
Reflex Clarity!



That's the Shamrock-Harkness Two Tube Reflex which has created such a sensation among experimenters and amateurs by its amazing performance. It combines the best features of the most powerful circuits in use today.



SHAMROCK MANUFACTURING CO. Dept. 29-C, Market St., Newark, N. J.

**SHAMROCK**  
FOR SELECTIVE TUNING

The set for the masses as well as the classes

Also ask to see the improved SHAMROCK-HARKNESS THREE-TUBE COUNTERFLEX The wonder set \$39.50

SHAMROCK KIT CO. Dept. 29-C, Market St., Newark, N. J.

Please send me a copy of "Shamrock Radio Builder's Guide Book" containing diagrams and complete instructions for building 16 sets at prices ranging from \$15 to \$35. I enclose 10 cents U. S. stamp or coin.

Name \_\_\_\_\_  
Address \_\_\_\_\_



















# Radio Digest

PROGRAMS  
Illustrated

Published by the Radio Digest Publishing Company, Inc.  
510 North Dearborn Street  
Chicago, Illinois  
Telephone: State 4372, 4373, 4374, 4375

E. C. RAYNER, Publisher

Eastern Office, Park-Lexington Building, 247 Park Ave.,  
New York. Telephone: Ashland 8144, 8145, 8146

Member of the Audit Bureau of Circulations

241  
PUBLISHED WEEKLY

**SUBSCRIPTION RATES**

Yearly in U. S. and Possessions and Canada, \$1.00  
Foreign postage, \$1.00 additional. Single copies, 10 cents.

Vol. XIII Saturday, April 25, 1925 No. 3

## Increasing Amount of Features

THE fan of today is offered about one hundred features daily from which to select his Radio entertainment. This means over thirty thousand in the year. New stations are continually coming on the air and soon this number will be materially increased. The broadcasters are facing a huge task in securing a hundred features daily. It is quite evident that considerable of the had will be accepted. If the managers are not alert, program gaps will be filled in with a large percentage of poor material and this kind of broadcasting will weigh down on the programs until the existing system of intensive broadcasting is dropped. Until then, however, no particular station can be censured because of its presence in the programs, as all are guilty to a certain degree; some, of course, more than others.

While no station can become perfect, yet the ones who have a clientele of listeners who know that when those stations are on the air they are assured excellent programs will be given precedence. These will be the stations that arrange their programs so that they conform, as far as practicable, to programs of the higher class.

## Radiating Receivers

MOST of the trouble that comes from radiating receivers is the direct result from those who do not know how to handle their set and from those who do not care for the rights of others. The ones who do not know never read papers or articles on this subject. There is only one way that this subject can be driven into the minds of those who will not read and that is through the broadcasting stations.

Perhaps station announcers can be of help in giving listeners relief if those offenders listening in will take heed to what is said. If the announcer will add to the subject announced each time something in this manner: "Some of your neighbors may want to hear this selection. Don't spoil their pleasure by allowing your set to oscillate," or, "If there were anything we could do to prevent our signals from fading sometimes, we would certainly do it, because we know that many operators in their attempts to counteract the fading put their sets in a radiating condition, thereby causing great interference among the other broadcast listeners in their neighborhood."

## Different Kinds of Interference

INTERFERENCE from power lines, violet ray machines, elevator motors, electric heating pads, door bells, gas engine plants, telephone bell ringers, street arc lights, trolleys and motors perplex hundreds of Radio listeners and many try to locate the cause in an effort to stop the effect in their sets. Others attribute all noises in a Radio set to static. They apparently do not realize that an elevator motor or an arc light on the street often sputters and mingles with the music of Radio concerts.

To determine whether the static is set up within the receiver or comes from outside sources connect the aerial and ground terminals on the set with a wire. If a noise is heard it comes from the set, if not and the noise comes in without the connection then it is not the set.

Many times the interference can be easily traced and the difficulty eliminated. Most owners of sets usually tell their troubles to the district supervisor instead of trying to locate their own difficulties.

## Advantages and Disadvantages

IF YOU are listening in to an uninteresting speaker, a tenor who slides and the soprano who flauts, you can easily tune them out without any obvious discourtesy. It is much more comfortable than putting on wraps and making an elaborate and objectionable exit. It is to the fans advantage.

However, Radio has its disadvantages, for you cannot tell the amateur broadcaster what you think of him when he musses up the air. It is impossible to describe a person's feelings when he cannot come back at the offender just at the time when the clumsy manipulator of the squealing set that is a half block or a half mile away cuts into a symphony concert.

## RADIO INDI-GEST

### Station BLAH Practically Completed

WALLA WALLA.—The official photographer of the Walla Walla expedition is ready to shoot the pictures of the station—or anything else that may happen to be within the range of his camera lens. The station will be in operation next week, and a large number of guests—invited and otherwise—are expected to be present.

Chief Kokomo, will be master of ceremonies. He doesn't know what that means yet—but he'll find out. While watching the operator tuning up the set, the photographer snapped his picture. It is produced herewith as evidence. Not a bad looking chap, is he? His crown is an empty XXX peach can. The old boy is quite proud of it, as his enemy on the other side of the island has only a tomato can.

As darkness settled down upon the island, the chief decided to leave the station and go back to his hut. The chief's departure was touching. He was broke, so it was necessarily touching, very.

The Walla Walla Chamber of Commerce is planning to serve a light luncheon at the opening of the station. It will consist of bananas and halsa wood, so it will be very light.



### The Announcer

The concert was over, the artists had gone.  
The lights were turned low in the room:  
I sat at the switchboard, half dreaming, alone,  
For my life was overshadowed with gloom.  
A little "Love nest" way out south, I could see.  
We had been, Oh! so happy, out there;  
"Till the "Reaper" intruded between "She" and me.  
Left me here, but my darling was—where?

Alone I sat staring with unseeing eyes,  
At the face of the microphone there:  
"Till its black face seemed human, and to my surprise,  
It whispered, "She's waiting somewhere;"  
With hands that were steady, through no power of mine,  
I tuned the broadcaster with care;  
Then I switched on the current, and heard the shrill whine,  
Of the instrument "taking the air."

Up—a notch at a time—past the safety mark.  
The big motor screamed in protest;  
While the microphone's face, though still solemn and dark,  
Seem to say "Make her go her best."  
Up again—"Till I saw by the gauge's face,  
'Twould be folly to push her more;"  
But I knew she was searching through measureless space,  
Paths never entered before.

Then, I opened the "Mike" and with heaving breast  
I uttered "Her" name, and Oh!  
It seemed that soft fingers, my brow caressed,  
And her voice answered, sweet and low:  
"I am always near, and will come when you call,  
But you never can hear my reply,  
'Till you tune out the world, with its sin and all,  
Won't you promise, that you will try?"

Then "She" said "Good Bye," and I woke with a thrill,  
Had I dreamed? That could hardly be.  
For the motor was shrieking its protest still,  
And I knew "She" had talked to me.  
"You must tune out the world, with its sin, and all,  
And then to your call, I'll respond."  
Had I fathomed death's secret, and pierced the pall  
Between me and the great beyond?  
E. H. RICHARDSON

### My Radio Girl

She tuned in on my broadcast,  
She had my wave length right;  
She brightened up my filament,  
Received me with delight.

Love's current never faltered,  
Ran free from static's strife;  
She was my super-heart-odyne,  
And amplified my life.

My soul ran on high voltage,  
And raced on unabated;  
Dex Cupid's arrowed ampers,  
Love's Diode radiated.

Her sweet lips formed the contact,  
A hiding post for mine;  
Our arms, a coil around us,  
Impudence just divine.

My heart's a burnt-out tube now,  
Transformed from faith's believer;  
Love's circuit now is grounded,  
She switched off her receiver.

LEO LOEB

### Hot Ice Cream!

My new girl is the Radio girl—  
With a broad cast in her eye;  
She's a pretty little girl,  
With a pretty little curl,  
And she bids me to stand by.  
She urges me to listen in  
While the whole wide world she'd tell  
That she's pretty lips  
And pretty hips—  
That taste (and shake), like—jell.  
GEO. A. WRIGHT

## Time for Action



## Condensed

By DIELECTRIC

After listening to KHJ the other night we are more convinced than ever that one of the prime requirements of the successful announcer should be a ready wit. Wit, in this instance, as distinguished from attempts at humor often go flat when told before the "mike." In less than one hour, "Uncle John" Daggett, the announcer and mainspring of that station, turned three rather embarrassing situations to his credit simply by the quick use of his head. While I am no authority on announcing and announcers I think many a young, promising announcer could well afford to tune his set to KHJ and listen to a master such as Uncle John.

Possibly you were not tuned to KSD, in St. Louis, at the time Mr. and Mrs. Ingalls were giving enjoyment to those of us who were. It is for your enlightenment that mention is here made of the singing of these two vocalists, singing which disclosed musicianly feeling. It would be unfair to omit mention of Mrs. Neal, the skillful accompanist.

Not all persons awake during early morning hours are DX'ers, for many are afflicted with insomnia and to them I offer a suggestion. Join the drowsy listeners who manage to keep near their sets until time for the insomnia club program from KYW, Chicago, and you will find sleep closer at hand when the last rollicking selecting is completed. These programs are full of lively features sure to put you in good humor.

Our citizens are rapidly forging ahead in appreciation and performance of good music. As a nation we have been considered lacking in both respects—but not now! As an example of musical progress just note the number and ability of school orchestras in the country. Their development is markedly indicative. To cite one instance let me refer you to the high school orchestra appearing in the studio of KFKX, at Hastings, Neb. Training and natural ability were quite evident.

At times some of the stations to which we regularly listen are uninteresting, to say the least. One of these is Station WSAI, at Cincinnati, to which I listened when Perrine's orchestra droned its way through outworn numbers followed by popular (?) songs. Spruce up!

We are on with another contest to see which of the many announcers secures the public's verdict of "best." This should be highly educational with results beneficial to all interested in broadcasting. If voters consider all phases of announcing requirements they will make intelligent decisions. Who do, or do not, respect your wishes?

It was difficult to realize so many were actively taking part in the choral singing in the concert of the associated glee clubs of America, broadcast through WEAF, New York city. While the songs selected were above criticism the rendition was not, as the ensemble was poorly balanced with basses and baritones predominating.

Few concerts are heard by Radio listeners more worthy of unstinted praise than that presented by the College of Music through Station WLW. Comparable to noted symphonic orchestras is this product of Cincinnati's institution of music. The singing of the waltz song from Kotzebue and Juliet was entirely commendable.



# Low Loss Tuned Radio Frequency Receiver

## Part I—Description and Winding of Coils

By George Walters

**I**N THE January 31st issue of Radio Digest there was an article by Jacques Fournier on low loss radio frequency transformers that contained data for which the writer had been waiting for some time. Using the coils described by Mr. Fournier as a basis, and a bread-board layout on which to experiment, the receiver about to be described was developed.

### Losses vs. Low Loss

There are several known characteristics

#### LIST OF PARTS

3	Variable condensers .0005 mfd.	\$15.00
1	Audio frequency trans., 4 to 1	5.00
1	Audio frequency trans., 3 to 1	5.00
2	Rheostats, 6 or 10 ohms	2.00
1	Lb. No. 20 doc. wire	1.00
1	Variable grid leak	1.85
1	Bypass condenser, .5 mfd.	.30
1	Fixed mica cond., .002 mfd.	.40
1	Fixed mica cond., .00025 mfd.	.35
5	Sockets, cushioned	5.00
1	Two circuit jack	1.00
1	Open circuit jack	.70
1	Filament switch	1.00
7	Binding posts	1.55
1	Panel 7"x24"x 1/8"	3.00
1	Panel 9"x23"x 1/8"	4.00
1	Brackets, wire, screws, etc.	3.00
1	Cabinet 7"x24"x10"	3.25
<b>Total cost.</b>		<b>\$58.55</b>

#### Accessories

- 1 Storage battery, 6-40 to 6-100.
- 2 B battery units, 45 volts each.
- 5 Vacuum tubes, type 201-A or 301-A.
- 1 Lead speaker.
- 1 Antenna, inside or outside, 40' to 125'.

of tuned radio frequency sets with which anyone who attempts to build such a receiver should be familiar. First of all it is not hard to build such a set if the elimination of losses is disregarded, as, if sufficient losses are inherent in the transformers and condensers there will be no tendency to oscillate at lower wave lengths and the amplification will be fair throughout the entire range. To offset this elimination of oscillation, however,

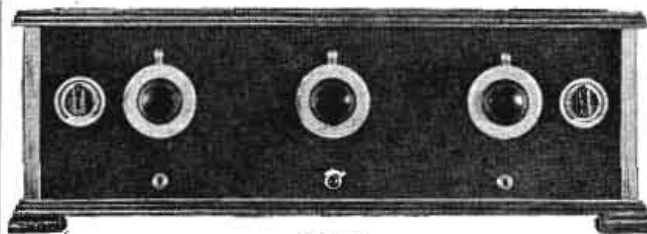


Figure 1

meters the range and volume are equal to the average tuned radio frequency set; above 475 the efficiency is not as great as might be desired and is probably

the large dial to the left is the output of the second stage. No means is provided for plugging in after the first stage of audio since it was found that when local

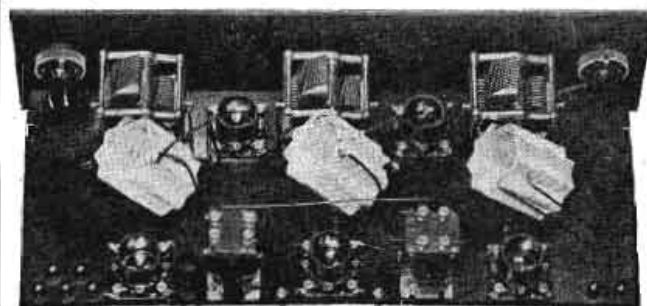


Figure 2

about the same as that obtained from a good three circuit regenerative receiver. On any wave lengths the tuning is far sharper than with ordinary tube form coils. It would be possible, by the use of switches, to increase the efficiency at the higher wave lengths so that, when one

stations are too strong for the second stage, the rheostat controlling the R. F. tubes served as an excellent volume control and the brilliancy of the two R. F. tubes could be reduced without impairing the quality.

Figure 2 shows the rear view of this set and the reader familiar with tuned radio frequency will see at once that the energy travels logically across: from the antenna and the ground binding posts in the lower right hand corner to the first coupler, then to the tube between condensers, into the next coupler and then into the second R. F. tube which is between condensers. The coupler connecting the second R. F. tube to the detector is that at the left in figure 2 and from this coupler it goes to the detector tube which is in the lower left hand corner with the variable grid leak close beside it. Its progress is then across the back

of the sub base, in the foreground of the picture, and the tube socket in the lower right hand corner is the second audio frequency stage from which the energy travels beneath the sub base to the output jack below the first condenser. This arrangement makes for easy wiring and little tendency for interaction between various stages and the two types of amplification. A variable grid leak should be used by all means as the receiver was

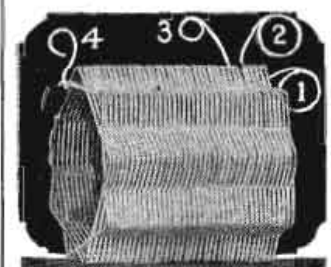


Figure 3

found somewhat critical in this respect, the final adjustment being at about six megohms. Cushion sockets are a very desirable feature as there will be no ringing noise from the monophonic construction of these tubes when the condensers are turned or the tube is jarred.

The writer has presented this receiver frankly, giving its results exactly as found, with no claims that it will do "coast to coast" on any and all occasions, nor that it will bring in all stations with equal efficiency. It may be possible to develop a receiver in which the efficiency is 100 per cent on all wave lengths without a multiplicity of controls but the writer has not as yet seen or heard of such a circuit. We can now proceed to the actual construction of this receiver which many can use as a finished set and many others will use as the basis for further experiments. In this issue the writer will present the construction of the coils, and take up the panel and base board layouts next week.

#### The Winding Form

The form for winding this transformer is shown clearly in figure 1. As will be seen, a square block of wood, bakelite, hard rubber or metal is necessary, 4 inches on a side and from 1/4 to 1 inch thick. A circle is drawn in the center of this, 2 1/2 inches in diameter and divided into nine parts so that holes will be drilled 49 degrees apart around the (Continued on page 18)

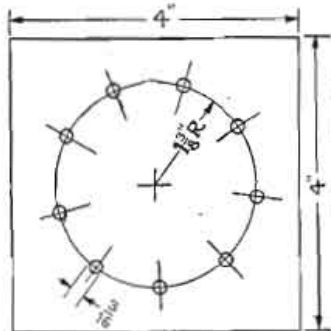


Figure 4

there are the disadvantages that the set is not selective and the range is considerably cut down. The writer has endeavored to develop a receiver in which all

wished to receive stations above 475 meters, he might throw in more primary turns in the second and third R. F. transformers which would bring the regeneration almost up to oscillation and the high efficiency of the lower wave lengths would also then be found at higher wave lengths. As the set stands, the writer can bring in all but one or two of the high wave length stations so this added feature was not considered sufficiently necessary to warrant putting it in.

The first layout followed the usual tuned R. F. practice of putting the three large dials at the left end of the panel and the two rheostats at the right, but, after studying the circuit and trying several layouts, an arrangement was found which permitted of symmetry on the front panel and also on the baseboard without loss of efficiency.

#### Analysis of the Assembly

Figure 1 shows the front view of this set and in this illustration the rheostat at the left end of the panel controls the two R. F. amplifier tubes while the rheostat at the right end of the panel controls the detector and the two audio stages. The first large dial to the left is on the condenser in shunt to the secondary of the antenna coupler, the second dial is on the condenser in shunt to the secondary of the transformer connecting the first and second stages, while the large dial to the right is across the secondary of the transformer connecting the second stage to the detector. The filament switch will be noted directly under the center dial, the jack below the right hand dial is the detector output jack, while the jack below

of the losses that it was possible to get rid of were eliminated, as low loss condensers and low loss coils were utilized and exceptional care taken in the layout and wiring. The results as the receiver now stands might be summed up as follows: On wave lengths between 250 and 400 the range is exceptional and is not exceeded by super-heterodyne; from 400 to 475

## Why The Kane Antennae Eliminates Power Noises

All power lines, transformers, and other devices carrying or using electric power on a large scale are grounded, so that if any leakage develops it runs harmlessly into the earth without damaging or destroying property or life.

These leakages run through the earth back to the central generating stations, or to the sub-stations that control the distribution of electric power.

When your receiving set is connected to the ground, as most sets still are, these leakages cause noises to enter your set, thus ruining your reception.

Electric currents do not travel steadily along the power lines; they surge up and down, the current traveling in waves like the water in the ocean.

If your aerial is close to a power line these waves of electric current cause similar waves to be generated in your aerial, and these come out of your receiving set in the form of noises.

The Kane Antennae gets away from both these sources of noise by using a combination of two tried and proven principles: The use of the counterpoise, and the use of transpositions in the wires composing the aerial and counterpoise.

It is this particular combination of these two principles as developed for radio reception in the Kane Antennae which forms the basis of the patent application that is now on file.

The counterpoise takes your set away from the ground and all the power noise travelling through it.

The transpositions cause the currents generated in the aerial and counterpoise by nearby power lines to cancel themselves out.

Ask your telephone engineer how they overcome power induction in the telephone lines. He will tell you by transposing their wires. That is the principle which has been successfully applied in radio reception in the Kane Antennae.

Therefore with this combination of two proven principles, all power noise are eliminated from your reception, and static and interfering signals are cut to zero.

#### THE TWO MODELS OF THE KANE ANTENNAE

The Kane Antennae is made in two models: The Special Kane Antennae for use with Super-Hets, and the Regular Kane Antennae.

The Special Kane Antennae is designed for use with all receiving sets that are still getting "low-grade" reception with an ordinary aerial and ground.

The Regular Kane Antennae for Radiola Super-Hets uses the same basic principle as the Regular Kane Antennae to eliminate power induction with its counterpoise system.

When a blow-out is used with a Super-Het or Radiola Super-Het, use the Regular Kane Antennae should be used with it.

Whether or not you are troubled with power noise you should use a Kane Antennae with your receiving set, because the Kane Antennae is the only form of antenna on the market that has been scientifically designed to give you the best possible reception in the most difficult conditions of reception.

Who saw good reception set with a low, inefficient aerial and ground? Be fair to your set; be fair to yourself; hook your set up to a Kane Antennae and hear as you have never heard before.

When you buy a Kane Antennae you are buying a tested, tried and proven product. The Kane Antennae is the sensation of the Pacific Coast—you see it everywhere from British Columbia to the Mexican Boundary.

#### SEE FOR YOURSELF JUST WHAT THE KANE ANTENNAE IS

We will sell you the working drawing with instructions for creating this wonderful Antennae for a dollar bill. Then after looking over this drawing you decide you would rather have a factory built Antennae. Then we build one for you. We will take back the drawing and allow you full purchase price as an order for an Antennae.

- The Special Kane Antennae for Radiola Super-Hets..... \$ 6.50
- The Regular Kane Antennae for all other sets, using a ground connection..... 13.00
- Working drawing with instruction for erection..... 1.00

(Stamps not accepted)

Postpaid to any part of the United States or west C. O. C. when 25% of price accompanies order.

**THE KANE ANTENNAE COMPANY, Aberdeen, Washington**

### HOW TO OPERATE SET

(Continued from page 7)

ports marked "loud speaker" at the rear left-hand corner of the sub base, inside the set. Should more volume be desired, turn switch L to position 2, while turning it to point 3 will further increase the volume.

Considering now, the analysis of the set which formed the first part of this article, and considering also, the tuning procedure just concluded, it should be clear that one is endeavoring to bring three tuned circuits to resonance on a single wave length so that the program being broadcast on that wave length will be heard with maximum volume and clearness, to the complete exclusion of all other signals. The tuned circuit consisting of condenser D and the secondary of transformer C is adjusted to maximum response to the desired wave length by knob D. The two tuned circuits, one of which consists of condenser G and the secondary of transformer F, the other consisting of condenser J and the secondary of transformer I, are brought to resonance simultaneously by the use of knob GJ.

Due to slight differences which are bound to occur in the values of the four instruments included in these two tuned circuits, the vernier condenser H is provided and connected across the larger variable condenser G. The tuning procedure outlined first brings the circuit including D into resonance with the circuit including J and, of course, into resonance with the program it is desired to receive. Adjustment of the small condenser H then brings the circuit which includes condenser G into exact resonance with the other two just mentioned. The control E enables the operator to keep the first tube U at maximum efficiency and, while there may seem to be a great many controls and that a person has only two hands with which to manipulate them all, one quickly finds that two are used for preliminary coarse adjustment, two are then used for fine adjustment and only one is used for the final setting to maximum efficiency.

(The next receiver to be considered for analysis, trouble shooting and operating, is the Freshman Masterpiece. Comment on these articles will be appreciated by the Technical Dept.—Editor's Note.)

As electrons in a tube flow from negative to positive, place a magnet against the tube on the plate side to increase sensibility and signal strength.

### LOW LOSS TUNED R. F.

(Continued from page 17)

circle. In the inductance which we are going to build, the one-over, one-under method is used. The rods on which the wire is wound may be either large nails or wood dowel pins as shown, and should be 1/4-inch in diameter and 1 1/2 inches long. If metal pins are used they can be soldered to the metal block which forms the base; if wood pins are used they can be glued to the wooden base, or, if metal pins are used with the bakelite or hard rubber base, they can be put in by mak-

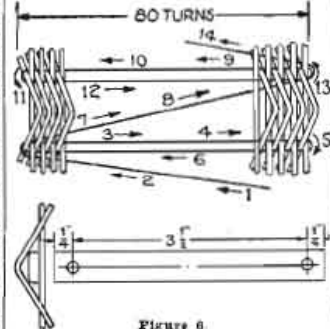


Figure 6

ing the holes a little small and driving the pins through.

#### One-Over, One-Under

The method of winding is shown in figure 4, and, as will be seen, the wire goes under pin 1, over 2, under 3 and over 4. Since there are an odd number of pins, the second turn will go over the pins that the first turn went under. Eight turns are wound in this way and these form the primary of our transformer. At the end of the eighth turn make a large loop in the wire about 6 inches long and twist this loop so it will not loosen. Resume winding and add 72 more turns, which will be correct for use with a .0005 mfd. (500 nmfd.) condenser.

The wire used is to be number 20 double cotton covered which will hold its shape well after the coil is completed. Using this number 20 wire, wound as shown, the length of the coil will be 3 inches and you will have a coil such as is shown in figure 3. This coil is to be held together with heavy thread, preferably waxed, and

the method of holding the wires in place with one continuous piece of thread is shown in figure 5.

#### Securing with Thread

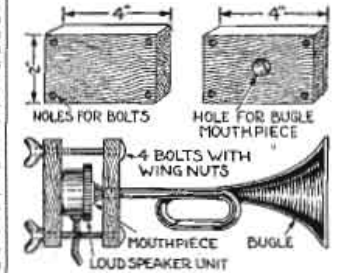
The alternate turns cross each other diagonally at 9 points around the coil and it is at these 9 points that the thread holds the turns together. Following the thread in figure 6, it will be noted that it goes across to the left under the odd turns, around the end of the wires and then under the even turns and over the odd turns to the opposite end of the coil where it goes around the last turn and comes back under the odd turns and over the even turns. Thus the thread forms one complete loop and is carried across, as denoted by arrows 7 and 8 to the next intersection, where a loop is wound in the opposite direction as shown by arrows 9, 10, 11, 12 and 13. When the thread has been carried clear around the coil in this way and the ends tied together the coil can be slipped from the form either by removing the pins one at a time or slightly squeezing them together at the free ends and slowly sliding the coils from the pins.

A strip of bakelite or hard rubber is now cut as shown in figure 6 and measures 4 inches long, 1/4 inch wide and 1/8 inch thick. While the illustration shows two holes drilled in this strip, it is only necessary to drill one for the method of mounting used by the writer. Before slipping this piece of bakelite through one of the points of our 9 pointed star coil, it would be well to carefully smooth off the corners with a file so that the insulation on the coil will not be injured. After slipping this piece of bakelite into the coil, the loop made at the eighth turn can be untwisted and cut at its middle point. We will then have two separate windings, one of 8 turns and one of 72 turns.

(There is quite a discussion in the Radio field at this time as to whether losses are desirable or not in tuned R. F. receivers. This set as constructed by Mr. Walters is an excellent example of low loss construction and the sharpness in tuning will be found remarkable. It is planned at this time to give the entire construction in three parts of which this is the first.—Editor's Note.)

#### Bugle Makes Loud Speaker

The illustration shows how I made use of my bugle for a loud speaker. Two blocks of wood 4 inches long and 2 inches wide and 1/4 inch thick with two bolts



fitted with thumb nuts are the parts necessary. The parts are fitted to the horn as shown. The length of the bolts will depend on the kind of a loud speaker unit used.—John Crowl, Jr., Chicago, Ill.

A hinder made by dissolving a powdered phonograph record in alcohol is better than shellac to coat coils.

**CROSLLEY TUBE-50**

**\$14.50**

The Little Giant of Radio Gets its Best Reception with phones frequently repaired.

**Distance**

on the phones—with certainty and regularity—on the Crosley one-tube 50. The radio which told the world that the MacMillan North Pole expedition was safe and sound. The radio that kept communication open to Leonard Weeks at Minot, N. D., when all other receivers failed.

There is nothing better than the Crosley 50 for the radio beginner.

There is nothing to excel it in value; unless it be the larger Crosley sets.

Stations always come in at the same place.

For sale by good dealers everywhere. Other models priced from the two tube 51, at \$18.50, to the Tridyn Special with sloping panel, at \$65. All Crosley Radios are licensed under Armstrong Regenerative U. S. Patent 1,115,148. Price is quoted as without accessories.

Prices West of Rockies—Add 10%  
Write for Complete Catalog

**The Crosley Radio Corporation**  
Frank Crosley, Jr., President  
4221 Broadway St., Cleveland, Ohio  
Crosley owns and operates broadcasting station WFLW

**The "Goode" Two-o-One**

**A**

Le Ton d'argent

**Guaranteed**

**BY MAIL ONLY**

**\$1.89**

Postpaid

**QUARTER AMPERE AMPLIFIER-DIODE TUBE RADIO TUBE**

**GUARANTEED SATISFACTORY**

All "GOODE" Tubes Sold Direct to the Consumer—No Dealer Profits

**ONE—"Goode" Detector-Amplifier \$1.89**

**THREE—"Goode" Detector-Amplifiers 5.00**

(All postage prepaid)

The "Goode" Two-o-One A Tube amplifier or diode. It is a quarter ampere, 1/2 inch, standard base silvered tube.

Send address of postal money order—New York Draft—or check to—

**The Goode Tube Corporation**  
Incorporated  
Owensboro (Dept. A) Kentucky

**Now!**

**PANEL MOUNTING TYPE THORDARSONS — AT SAME PRICES AS REGULAR TYPE**

**SUB-PANEL**

Audio Frequency

2-1, \$5.00    3 1/2-1, \$4.00

6-1, \$4.50

Unconditionally Guaranteed

**THORDARSON**

Super

**AMPLIFYING TRANSFORMERS**

Standard on the majority of quality sets

**THORDARSON ELECTRIC MANUFACTURING CO.**  
WORLD'S GREATEST AND LARGEST EXCLUSIVE TRANSFORMER MAKERS  
Chicago, U.S.A.

**Steinite** Low Loss

**Interference Eliminator**

What Radio Users Have Been Looking For

For those who have had Interference Troubles this new auxiliary tuning device will trap out the undesired stations.

**Select Your Stations at Will**

The air is so crowded with music and voices that the average set fails to bring in the desired stations properly. The **Steinite Interference Eliminator** shuts out local and other interference. You get one station at a time, what ever you want, and can tune it in loud and clear.

**Improved Results with Tube or Crystal**

Try for yourself entirely at my risk the wonderful improvement this inexpensive little device will make in the reception of your set. Sold on absolute guarantee of satisfaction or money back and the radio public. Improves reception on both crystal and tube sets that use an indoor aerial, outdoor aerial or loop antenna, but will not help a set using loop antenna. Clears up reception wonderfully and partially eliminates static.

**\$1 Amazing Satisfaction or Money Back**

**STEINITE LABORATORIES, 1061 Radio Bldg., ATCHISON, KANSAS**

# A. B. C. Course in Radio Fundamentals

## Chapter V—The Alternating Current Circuit

By David Penn Moreton

If a constant electrical pressure, both in value and direction, be impressed upon an electrical circuit, the current produced by this pressure will be equal to the value of the pressure in volts divided by the resistance of the circuit in ohms. In a case of this kind the opposition offered by the electrical circuit to the movement of electricity through it is due entirely to the resistance of the circuit, which depends upon the kind of materials composing the conductors, their length and size, and temperature.

If an alternating electrical pressure be impressed upon this same circuit there will be an alternating current produced in the circuit, and the current at each instant of time will be equal to the value of the electrical pressure at that instant divided by the resistance of the circuit provided there is no inductance or capacity present in the circuit. The pressure acting on the circuit may be represented by the curve marked E in figure 27, and the current may be represented by the curve marked I in the same figure.

The maximum value of an alternating electromotive force or current, in the value of the electromotive force, or current, represented by the maximum height

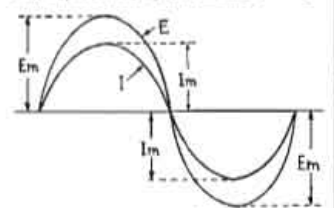


Figure 27

of the electromotive force, or current, curve. Thus in figure 27 the lines  $E_m$  represent to the scale of the figure the maximum positive and negative values of the electromotive force and likewise the lines  $I_m$  represent to the scale of the figure the positive and negative values of the current. The fact that the current curve in figure 27 is drawn below the voltage curve does not necessarily mean that the values of the current are less than the values of the electromotive force unless the scale to which the current curve is drawn is less than the scale to which the electromotive force curve is drawn.

### Value of an Electromotive Force

The average value of an electromotive force, or current, is equal to the average of all of the instantaneous electromotive forces, or current, for a complete alternation. The alternation is one-half a cycle and corresponds to a complete set of positive or negative values. In the case of a sine-wave electromotive force, such as would be produced by rotating a loop or coil of wire in a uniform magnetic field as previously explained, the average value is equal to .636 of the maximum value as shown in figure 28. The effective value of an alternating current is numerically equal to the steady direct current that will produce the same heating effect in a given time when passed through a resistance as is produced by the alternating current in a like time. The heating effect of a current is proportional to the square of the current, and the average heating ef-

fect of an alternating current will be proportional to the average value of the instantaneous currents squared, and the effective current will be equal to the square root of the average value of the instantaneous current squared. The effective value of a sine-wave alternating current is equal to .707 of the maximum value as shown in figure 29.

The effective value of an alternating current electromotive force bears the same relation to its maximum value as exists between the corresponding values of the current. The majority of alter-

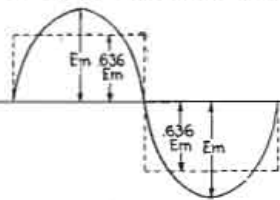


Figure 28

nating current ammeters and voltmeters indicate the effective values of the current and electrical pressure.

The above numerical relations apply to sine-wave currents and pressures and cannot be used if the wave forms are other than sine waves. The ammeter and voltmeters, however, will indicate the values of the same quantities regardless of the shape of the wave. The form factor of a wave is numerically equal to the effective value divided by the average value and for a sine wave it is equal to 1.11. Sine waves will be assumed in the following discussion.

### Phase Displacement

It will be observed, in figure 27, that the current is zero where the electrical pressure is zero, that the current is a maximum when the electrical pressure is a maximum, or in other words, the current and pressure are passing through corresponding values of their respective cycles at the same time, and in such a case the two quantities are said to be in phase. The two curves shown in figure 30 represent an electrical pressure E and a current I which are displaced in phase. This phase displacement is usually measured in degrees. The total length of the line AC, corresponds to 360 degrees, or one cycle of the electromotive force; and likewise the length of the line DG, which is equal in length to the line AC, corresponds to one cycle of the current. The two curves E and I are displaced in phase from each other the same fractional part of 360 degrees as the length of the line AD is a part of the length of the line AC.

The time required for an alternating pressure or current to complete one cycle is called the period of the pressure or current. Thus the period of a 50-cycle electromotive force would be one-sixtieth of a second. The phase displacement of two curves with respect to each other is sometimes measured in time as well as in degrees. The time displacement of the two curves shown in figure 30, will be such a part of their period as the length of the line AD is a part of the length of the line AC.

The current in figure 30 is said to lag

the electrical pressure because it passes through zero value in the positive direction after the electrical pressure passes through zero value in the positive direction. When the reverse relation exists between the current and the pressure the current is said to lead the pressure. Of course, if the current lags the pressure, the pressure will lead the current and if the current leads the pressure the pressure will lag the current.

### Capacity and Inductance

When capacity or inductance, or both, are present in a circuit, the total oppo-

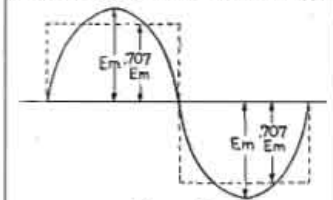


Figure 29

sition offered by the circuit to the flow of electricity through it will be greater than the ohmic resistance of the circuit unless the effects of the capacity and the inductance neutralize each other, in which case the opposition offered is equal to the ohmic resistance of the circuit. The combined effects of inductance, capacity and resistance is called the impedance of the circuit and it is measured in ohms just as the resistance in a direct current circuit is measured in ohms. The expression known as Ohm's Law for the alternating current circuit states that the effective current in amperes is equal to the effective pressure in volts divided by the impedance in ohms.

$$\text{Effective current} = \frac{\text{Impedance}}{\text{Effective pressure}}$$

$$\text{or} \quad \frac{\text{Amperes}}{\text{Volts}} = \frac{\text{Ohms}}{\text{Ohms}}$$

Using symbols for the above quantities we have

$$I = \frac{E}{Z}$$

The expression for the value of the impedance of a circuit in ohms is

$$Z = \sqrt{R^2 + \left[ 2\pi fL - \frac{C}{2\pi fC} \right]^2}$$

in which R is the resistance of the circuit in ohms; f is the frequency in cycles per second; L is the inductance of the circuit in henrys; C is the capacity of the circuit in farads; and  $\pi$  is equal to 3.1416.

The portion of the above expression in parenthesis is called the reactance of the circuit and it is composed of two parts: one due to the inductance  $2\pi fL$ , called inductive reactance and one due to capacity  $\frac{C}{2\pi fC}$ , called capacity reactance.

From an inspection of the above expression for the impedance it may be seen that the inductive reactance increases with an increase in the frequency and an increase in the value of the inductance, while the capacity reactance decreases with an increase in the frequency and an

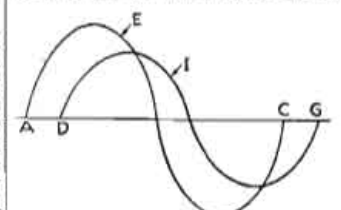


Figure 30

increase in the value of the capacity. On account of the above relation and since the resultant reactance is equal to the inductive reactance minus the capacity reactance it is possible to make the resultant reactance zero by changing either

(Continued on page 20)

**pep up your set with good tubes**

TUBES make all the difference in the world. You'll agree with that statement the moment you switch to **MAGNATRONS**, the moment you notice how clearly and powerfully these tubes bring the concerts to you.

**MAGNATRONS** are for sale by the better dealers everywhere. The type DC-201 A, the DC-199, and the DC-199 with large base each sell for only \$3.

CONNEWAY ELECTRIC LABORATORIES  
209 10th Ave., N. Y. City

**MAGNATRONS**

**Lincoln**  
Collapsible  
**LOOP AERIALS**

**"Recommend It!"**  
**SAYS R. W. COTTON**  
Designer of Cotton "Super-Het"

R. W. Cotton, famed designer of the Cotton Superheterodyne, wrote us March 10, 1925, as follows:

Gentlemen:  
I had the pleasure last night of trying out one of your "Cotton" Tap Loops in connection with the "Cotton" Super-Het. The results obtained were very satisfactory and for the amount of money represented by your Loop I do not know where in today's market the public can obtain equal value. Your Loop functions properly with my set and you may recommend it for that purpose with my sanction. Sincerely yours,  
R. W. COTTON.

**Lincoln Center-Tapped Loop \$6.50**  
For any set employing radio frequency amplification. Particularly adapted for "Super-hets" requiring a center tap.

**Lincoln 4-Point Tapped Loop \$8.00**  
The only moderate priced Loop of this type on the market. Fine for all types of "Super-hets" and Super-Hets and tuned radio frequency sets. Where an outside Aerial is impractical. For the requirements of any set where it is desired to vary the inductance of the loop.

**BUY A LINCOLN LOOP**  
Sold by good dealers everywhere. If yours cannot supply you order direct giving your district name.

**Lincoln Radio Corporation**  
224 North Wells St. CHICAGO

**No Body Capacity!**

**Wade Grounded Frame Condenser**

ADAPTED to all circuits and especially to regenerative and super-het circuits employing regeneration.

Wade condensers have an accurate square law or straight line wave length curve and the dielectric absorption loss is, by laboratory test, less than in any other.

This is the only condenser recommended for use in the now famous Hetduogen.

**Three Features**

1. No Body Capacity. Separately grounded frame insulated from both sets of plates shields the condenser from all body capacity effects.
2. No rubbing electrical connections. The grounded frame and frame are soldered out of the electrical circuit, insuring absolute mechanical operation.
3. One-piece plates. Dielectric resistance and skin effect losses are reduced to a minimum by insulating stamped brass plates integral together in one unit.

All sizes complete with 4-inch silvered vernier dial. For short wave: 000125 mfd., \$7.50; for Tune R. F., .00025 mfd., \$7.75; for Super, .0005 mfd., \$8.00; for oscillators, wave meters, etc., .001 mfd., \$8.50.

Dealers and Jobbers Write for Price Lists  
Exclusive Chicago Distributor  
**Brush Radio Laboratory**  
5025 Broadway CHICAGO

## A. B. C. RADIO COURSE

(Continued from page 13)

the frequency, inductance, capacity, or all of them. This relation between inductance and capacity is a very important one in connection with radio circuits and for this reason one should have a clear understanding of the subjects of inductance and capacity.

### Inductance of an Electrical Circuit

The inductance of an electrical circuit is a property of the circuit which in effect is similar to the inertia of a stream of water in a pipe. The inertia of the water tends to prevent any change in the velocity of the water in the pipe, so the inductance of the electrical circuit tends to prevent any change in the velocity of the electricity or the current in the electrical circuit. When a current of electricity is established in a conductor, there is a magnetic field produced about the conductor, the intensity of which depends upon the shape of the conductor, the value of the current in the conductor, and the kind of materials surrounding the conductor. As the current is increasing in value, the magnetic field is expanding; and when the current is decreasing in value the magnetic field is contracting. The magnetic lines of force composing the magnetic field are supposed to start at the center of the conductor and expand across the conductor into the surrounding medium as the current increases, and contact back across the conductor to the center as the current decreases in value. As a result of this movement of the magnetic lines of force, the conductor there will be an electromotive force induced in the conductor and the direction of this electromotive force will always be such as to tend to prevent a change in the value of the current. That is, with the current increasing in value, the induced electromotive force will be in the opposite direction to the current which tends to prevent the current increasing and with the current decreasing in value the induced electromotive force will be in the same direction as the current which tends to prevent the current decreasing.

Since the inductance depends upon the magnetic lines, or flux, cutting the conductor, it is apparent that any change in the shape of the conductor or the surrounding medium which results in a change in the magnetic flux being cut, due to a given change of current in the circuit, will result in a change in the value of the inductance. Thus a coil of wire will have a higher inductance than a straight conductor, and the inductance of the coil can be increased by inserting an iron core or by increasing the number of turns.

### Self Induction

When an electrical pressure is induced in a coil of wire due to a change of current in the coil itself, it is said to be due to the self inductance of the coil and the process is spoken of as self induction. When two electrical circuits are so located with respect to each other that there is an electrical pressure induced in one of them due to a change of current in the other, it is said to be due to the mutual inductance of the circuits and the process is spoken of as mutual induction.

The same unit is used for both self and mutual inductance and it is called the henry. A circuit has a self inductance of one henry, when there is an electromotive force of one volt induced in the circuit due to a uniform change in the value of the current of one ampere per second. Two circuits have a mutual inductance with

respect to each other when there is an electrical pressure of one volt induced in one of the circuits due to a uniform rate of change of current in the other circuit of one ampere per second.

The expression for the inductance of a simple solenoid, in henrys is as follows:

$$L = \frac{4\pi \times 10^{-9} N^2 \mu A}{10^9 l}$$

in which N is the number of turns in the winding;  $\mu$  is the permeability of the material composing the core; A is the cross-sectional area of the core in square centimeters; l is the length of the coil in centimeters; and  $\pi$  is equal to 3.1416. The above expression is not exact and the reader is referred to the Bulletin of the Bureau of Standards No. 74 for more exact expressions for the value of the inductance of coils of various shapes and sizes.

(Continuation of the alternating current circuit will be followed out in the next chapter. As Radio employs this current in large frequencies it is well to know just how it is produced and used in a circuit.—Editor's Note.)

## The Reader's View

### Perpendicular Galvanized Wire Aerial

The following may interest your readers: I have been making experiments with different kinds of antennas with the following results: Copper wire antenna 125 feet long and 30 feet high, just medium results. Galvanized wire antenna 200 feet long, 30 feet high, very good results. With the copper wire antenna I had quite a lot of static. With the galvanized wire the static was much less. Directly back of my house is a 2-inch pipe line laying on the ground and is over a mile long. By attaching my Radio to this pipe line I picked up stations from Springfield, Mass., to Oakland, Calif., and no static at all. However, the results were very faint. I have 2 galvanized wires from my house to the mine, a distance of 600 feet, that are used for a call bell and they are only 7 feet from the ground and with the Radio attached to these 2 wires I get everything from Boston to Los Angeles very clearly and with very little static. Now the queerest experiment I made was to put a 36-foot pole in the ground with a piece of galvanized wire from top to bottom, thus having a perpendicular antenna instead of horizontal and with this antenna only 26 feet long, I get Springfield, Mass., which is the

farthest station east from this point to Oakland, Calif., which is the farthest west, also Havana and San Juan, Porto Rico. All these stations I get very plainly without any static whatever. I have a super-heterodyne and this point is 56 miles southwest of Guadalajara, State of Jalisco, Mexico. Due to the fact that I can pick up the stations farthest away very clearly with an antenna only 26 feet long and without a particle of static, I would like to hear from some of the fans in the states who have the means of putting an antenna on the sides of their houses from top to bottom instead of horizontal and to see if they get the same results there as I get here.

I have picked up very clearly 79 stations in the U. S., 8 in Mexico, 1 in Cuba, 1 in Porto Rico and 1 in Canada. G. E. McCormick, Ameca, Jalisco, Mexico.

### That Unusual Interference

I have just finished reading the article in your January 19 issue, by Mr. Taylor South of Chanute, Kansas.

Can it be possible that these conditions do exist and that I have missed all the excitement? I assure you that I have been "listening in" regularly for the last three years and have never experienced any of the interference he notes. No doubt that his set is constructed of the very best parts—they all are (?). What I cannot understand is why he cannot separate stations that are at least 12 miles apart as WOS and WBB. A short time ago I noticed a sign in a Radio store window, which read as follows: "Most of the trouble in a Radio set is in not knowing how to tune it."

If Mr. South would care to write to me, I would be very pleased to give him the hook-up of a one, two, or three tube set similar to one that I have used and which he can build for less than \$10. A set that has one control and can be logged, a real DX getter and where he can cut as close as 2 meters and have no interference except a powerful local within five miles. I logged 57 stations on the loud speaker from New York to Oakland, and from Calgary to Atlanta, in one evening as a test. If he wants something that will go through them all and is willing to spend a little real money for good parts, I have another that will do the trick. I am located just three blocks from WCCO, and in an apartment block, and bring in coast to coast on a loud speaker while the local is broadcasting jazz, otherwise I listen in, and I assure you all they have some real programs.—R. D. Lewis, 1268 Nicollet, Minneapolis, Minn.

### Taken Exception to Mr. Henkel

The writer wishes to call your attention to the letter purporting to have been written by Mr. O. H. Henkel, Chicago, and published by your "Radio Digest" issue of January 19, 1925.

The writer is taking exception to that portion of Mr. Henkel's letter in which he states that there were a number of broadcasting stations which had hampered the international testing during the week of November 24 to 30, 1924, and specifically mentions KHJ, The Times, Los Angeles. He goes on to state that they (KHJ, The Times) went so far as to give a "Scotch" program during the specified silent period.

It is quite evident that Henkel has been badly misinformed, or else he does not know what he is talking about because even the most inexperienced listener in, not to mention the amateur, could distinguish the difference between local and international broadcasting.

The writer is undoubtedly voicing the sentiments of a large majority of listeners in to KHJ, Los Angeles, particularly by those west of the Rockies, when he states that the policy of KHJ has been to fully co-operate with every movement that tends to improve Radio and also that KHJ, Los Angeles, did not "cut in" with a "Scotch" program or any other program during their allotted time to be silent in the international test week of November 24 to 30, 1924.—E. D. W., Whitler, Calif.

### Announce Slogan with Letters

I read with a great deal of interest your article in the January 10 issue of Radio Digest entitled "Offers Suggestion to Clarify Letters."

The suggestion is pretty good, but I think that if every station would adopt a "slogan" to be used after the letters that would go a long way to clear matters up. When you hear this is station WCCO, Davenport, Iowa, "Where the West Begins," or this is station WEBB, Chicago, Illinois, "The Voice of the Great Lakes," if you do not catch the letters you would sure know who it is from the slogan.—H. B. Warner, Ashland, Wisconsin.

### Use of Spaghetti Tubing

The use of spaghetti tubing will not improve the reception of broadcasting in the slightest, but it sometimes greatly improves the looks of a set. Not only that, but it will positively eliminate the possibility of a short circuit of any kind, which might damage the vacuum tubes.

London, Madrid  
Newcastle,  
Aberdeen--

that's just a few of them

AGAIN Elgin Super-Reinartz leads all others! Every trans-Atlantic report investigated was found to be ABSOLUTELY authentic! Many happy owners of Elgin sets again tuned in the European stations.

**ELGIN**  
Super-Reinartz  
"The Ford of Radio"

will give you the selectivity and distance it has given others. And you can save \$50.00. Let us tell you how—

FREE

Mail the coupon TODAY for the complete working drawings of the famous Elgin Super-Reinartz, the set that sets the distance standard. They are free obligations, just a stamp for postage, please!

tear out this coupon—

ELGIN RADIO SUPPLY CO., Dept. A, 1707 E. Chicago St., Elgin, Illinois.

Send the FREE drawings of the Elgin Super-Reinartz at once. Also tell me how I save \$50.00 on my set. I enclose a stamp for postage.

Name \_\_\_\_\_

Address \_\_\_\_\_ (Please PRINT in detail)



New Standards  
for Old

All of us have an instinctive preference for excellence. But the standards of excellence change—progress.

The old standards of radio excellence—selectivity, volume, clarity and richness of tone—are now accepted as qualities to be expected from a superior five tube set. The standard of excellence has progressed to that of SIMPLICITY of control and operation, as best portrayed in MECO sets.

The MECO is a five tube set with two dial control and ONLY ONE DIAL TO LOG.

MECO sets are made in three models—cabinet and console—by the manufacturers of the famous Mecco Tubes. Sold by recognized radio jobbers and dealers.

Write us for the name of our dealer nearest you

Metropolitan Electric Co.  
DES MOINES, IOWA

Some territory now open for recognized radio jobbers.

**MECO**  
RADIO RECEIVERS

**Finer Selectivity**

Equip your receiving set with Apex Vernier Dials. They will greatly increase the efficiency of any set. Make tuning positive—bring in distant stations. Your dealer has them. If not, send \$2.00 for Royal Brass Finish—\$2.50 for Satin Silver Finish, or \$3.50 for DeLuxe Gold Plated (24k).

**APEX SUPER 5**  
This highly efficient tuned radio frequency receiver is most advanced in design and construction. An instrument that meets every critical expectation of the radio enthusiast.

Housed in a highly finished walnut cabinet, complete with Jones Metalizing Battery Cables. All settings highly gold plated. Selector 395 complete excepting accessories.

At All Good Dealers  
APEX ELEC. MFG. CO.  
1410 W. 59th St. Chicago  
Dept. 495-A

Send in Your  
**Paralyzed Tubes**  
to be Restored to Health  
in Our Laboratory

98% of your worn-out tubes can be put in first class condition. Better than that, out of the last 500 tubes received by us all but five were made to operate as good as new.

We can REACTIVATE UV-201A, C-301A, UV-199, C-299 and any other thoriated filament such as Atlas, Magnatron, De Forest, etc.

We cannot reactivate UV-200, C-300, WD-11 or WD-12 tubes, nor can we reactivate burned out tubes.

It Costs You Only \$1.00

if we can restore your tube so that it operates satisfactorily. If we are not successful, our charge is 50c. Why pay the price for new tubes when we can make yours as good as new for only \$1.00.

MAIL IN YOUR TUBES TO US FOR PROMPT RETURN, Parcel Post, C. O. D.

**A. O'CONNOR & COMPANY**  
9714 Thrall Ave. Cleveland, Ohio

# Hook-Up Good for Foreign Reception

## Set Built from Parts Found in Junk Box

The illustration shows a circuit for the fans to try. I made the hook-up while trying other hook-ups. It is a DX owl.

### WORKSHOP KINKS EARN A DOLLAR—

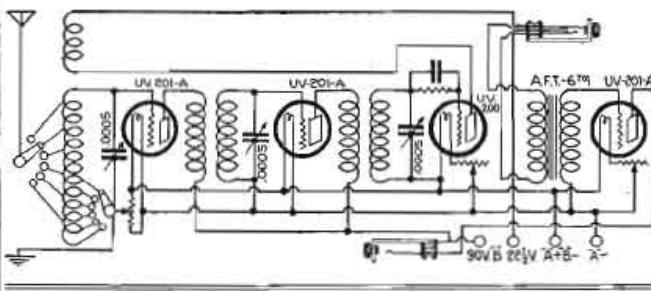
**T**HERE are many little kinks worked out at home that would aid your fellow Radio worker if only he knew about them. There are new hook-ups, new ways of making parts and various unique ways of operating sets that are discovered every day. Radio Digest is very much interested in obtaining such material. 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,  
510 North Dearborn St., Chicago

During the Transatlantic tests I picked up Newcastle, England, and Madrid, Spain, and have variation of both. I have also been successful in getting the coast on it and have picked up every territory in Canada except one. It is not difficult to tune and it can be built from parts found in most fans' junk boxes. The condensers are 23 plate of .0005 mfd. and the Radio frequency coils are homemade. They are wound as follows: Eighteen turns on the primary and 55 on the secondary. It is a fairly low wave tuner. I have picked up many amateur stations on it and daylight reception is sometimes good for thousand miles. The loud speaker is used on almost anything that the phones give reception.—John Mullikin, Washington, D. C.

### Aerial Support

Two heavy pieces of wood are cut in U-shape, one for each staff. If these are to be used on a flat roof, a triangular base is used when staffs are to be used on a gable roof. The size and strength of the plate and supports depend on the weight and length of the staffs. Two holes are drilled through the two arms and through the lower end of the staff, one at the top and the other about 1 foot below the first hole. Each set of holes must run true. The aerial and guy wires are measured to exactly the distance between the centers of the pieces when they are mounted on the roof or ground. The aerial being made fast to the staff ends, one staff is placed between the arms

## TWO R. F., ONE AUDIO FREQUENCY



—the top toward the other staff—and the upper bolt is inserted through the holes and locked. Then the staff is raised. If the staff is very high a rope slung about the center will aid in lifting it. The staff turns on the bolt as an axle. When the staff is erect the other bolt is slipped in and locked, holding the staff in a vertical position. When the other staff is

towards the other staff. Repeat with the other staff and the aerial will lay on the roof or ground as the case may be for inspection.—B. Kohout, Phillips, Wis.

### Use of C Batteries

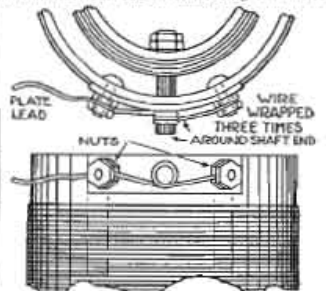
C batteries are most commonly used in amplifier circuits and will be of advantage only when 50 or more volts are applied to the plates of these tubes. Occasionally we find the C battery used in place of the conventional grid condenser and grid leak, which is really the best method when working with a weak signal, but when strong signals are being received this system falls down somewhat, being unstable and tending to distort. In such cases the C battery method is superior and is connected in the same manner as in the amplifiers, with its negative side going to the grid of the tube and the positive side of the C battery connected to the negative side of the A battery. In such cases a higher plate voltage can be applied to the tube in the order of 60 volts instead of the usual 13 to 22½ volts.

### Useful Soldering Hint

Place a piece of paper over the windings of coils when soldering a connection which lies directly over or near the coils. This will prevent solder or soldering paste from splattering on the windings.

## Perfect Contacts for Rotor Shaft Bearings

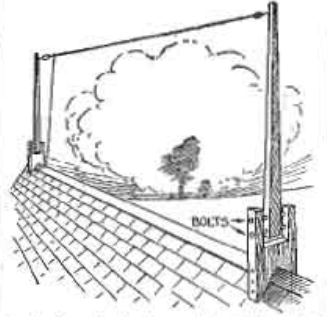
Where pig tails are not used and a brush of bearing contact makes the connection for rotors, considerable scratching will be heard when the rotor is turned. To make a good contact for such a bearing I used the method as shown. A wire is run between the bolts holding the shaft



bearing, the wire being given three turns around the shaft and drawn tight. The wire grips the shaft as it is revolved.—W. A. Meyer, San Antonio, Texas.

### Give Grid Leak Due Attention

Usually the grid leak does not get enough attention or else it is constantly being changed. It should not be touched unnecessarily, but some arrangement should be made so that different values of resistance may be employed when necessary. For local stations a comparatively low and a low resistance grid leak would so that the surplus charge may readily leak from the grid. When distant stations are being tuned in, the signal strength is low and a low resistance grid leak would lose almost all of the energy.



similarly raised the aerial will stretch taut, if it has been measured correctly. The U-shaped pieces, of course, are parallel, the openings facing each other, and, in case of a gable roof, running in line with the ridge. When it is desired to lower the aerial, take out the lower bolt and allow the staff to swing inwards

**5 TUBE SET \$45**  
NOT A KIT Assembled Complete  
**WHY BUILD WHEN YOU CAN BUY**  
The D-R-C. Completely Assembled Wonder Set—Five 5-Tube Tuned Radio Receiver—Built for performance and ease of use—Direct from the factory at the amazingly low price of \$45. Users like the beautiful Case—Dialable Dials and Controls—Best materials throughout—easily serviced, and money order order for the best set in the world.  
**THE FULLY GUARANTEED D-R-C WONDER SET** at the rock bottom price of \$45.10. Postage, 50c.  
Write for complete list of Accessories.  
**D-R-C RADIO CO., CHICAGO**  
329 S. La Salle St.

**DUNLAP'S RADIO CALL BOOK**  
Listing all Broadcasting Stations  
**Always Up-to-Date**  
Changes Mailed to you Each Month for a Year  
Up-to-date international call book compiled by Orrin E. Dunlap, Jr., Radio Editor, The New York Times, includes 4 columns for dial readings, owners, wave lengths, power and programs.  
**Immediate delivery**  
Send \$1 for book including monthly service for a year that keeps your station list always accurate. Correction pages have gummed edges easily attached in back of the book. Send cash, check, stamps or money order.  
**DUNLAP'S RADIO CALL BOOK SERVICE**  
Box 88, Flushing, N. Y.

**350 RADIO Storage "B" Battery**  
Lasts Indefinitely—Pays for Itself  
Saves and performance superior to others. Encouraged at a special low price. Approved and listed as Standard by Radio Manufacturers, including Radio Laboratories, Inc., Radio Engineers, Radio News, Radio Life, and other important institutions. Equipped with Gold-Plated Cells, an exclusive feature. **Send NO MONEY** now. Free literature to make the value of this battery clear. **World Battery Company**  
1219 So. Wabash Ave., Dept. 76, Chicago, Ill.  
Price: 350 cells, \$2.00; 500 cells, \$3.00; 750 cells, \$4.00. All equipped with Gold-Plated Cells.

**STAR DETECTORS SATISFY**  
Dear Sirs: Enclosed your Starcrystal 9 E. It's all I need and more. On a single crystal I received the following stations: WJAF, WJEA, WOB and WTAF.  
Sincerely yours,  
A. W. Oule,  
Clarendon, N. C.,  
2323 1/2 Street.  
The above letter is typical of hundreds received during the past two years. So you see the Starcrystal Detector, which has been used in excess of 100,000,000, is still going strong.  
**THE TYPE K STAR ADJUSTABLE DETECTOR**  
is a very satisfactory crystal set for Radio and Crystal sets.  
We make a complete line of crystal sets in which every standard material and are in position to quote attractive prices on quantity orders. We can build the set in quality and we will quote you. State quantity.  
**STAR CRYSTAL CO.**  
14th Floor, 525 Woodward Ave. DETROIT, MICH.

**Summer Profits**  
The Wood's Laboratory Type Re-Juv-A-Tube opens a new field for live dealers. Be the exclusive "Tube Reactivating Center" in your community. Brings back paralyzed or run down tubes to full life in five (5) minutes.  
Write for literature and proposition  
**TAY SALES CO.**  
6 No. Franklin St. Chicago

**Buy Tubes by Name**  
**WD-11 Radiotron**

**Look for the name**  
**WD-11 Radiotron**

**The Traffic Cop of the Air**  
Make your set selective—separate the interfering stations by simply putting the Traffic Cop on guard. The Ferbernd Wave Trap will tune out interfering stations, no matter how troublesome. Never reduces, but nearly always increases volume. Add a Ferbernd Wave Trap to your set and "police" your reception. Regulate the Traffic!  
Designed and manufactured complete by us after years of careful experimenting. It is not to be confused with imitations, hastily assembled from ordinary parts. Price is \$5.50. Shipment is made Parcel Post C. O. D. plus postage, or postpaid on receipt of price. Order today.  
**FEBERND ELECTRIC CO.**  
17 E. So. Water St. Chicago, Ill.  
Send for FREE Booklet





# Why the Grebe Synchrophase has such Selective Sensitivity



Grebe Binocular Coils



Usual Dial Spacing



Grebe Dial Spacing

On the usual dial short-wave stations are crowded onto the lower numbers.

On the Grebe dial, all stations have equal space making it easy to tune-in both short and long-wave stations.



Grebe Volume Control

**F**UNDAMENTALLY because of its *Binocular Coils*. These are fieldless and prevent strong local stations from disturbing the selective tuning of the radio frequency stages. They insure perfect balance and by isolating the set, give it its great selective sensitivity.

This power to select is further augmented by the *S-L-F* (straight line frequency) *Condensers*. These make unnecessary the crowding of short-wave stations onto the lower dial numbers. The stations are equally spaced around the dial so that it is easy to tune-in a station quickly and positively.

And then the *Volume Control* provides six graduations of volume for every sound that it may be always under control and its intensity made just as you desire to hear it.

Ask your dealer to demonstrate these exclusive Grebe features.

## A. H. Grebe & Co., Inc.

Van Wyck Boulevard . . . . . Richmond Hill, N. Y.  
Western Branch: 443 So. San Pedro Street, Los Angeles, Cal.

This Company owns and  
operates station WAHG

The  
**GREBE**  
**SYNCHROPHASE**  
TRADE MARK



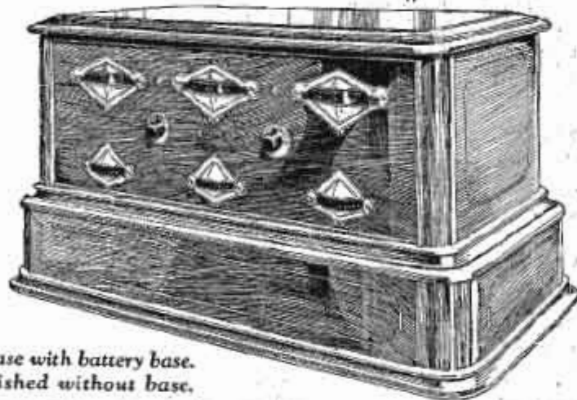
That which is  
fundamentally  
sound will en-  
dure.

*Ben He*



TRADE MARK  
REG. U.S. PAT. OFF.

All Grebe apparatus  
is covered by patents  
granted and pending.



Synchrophase with battery base.  
Also furnished without base.