

Front Panel Assembly of Hetduogen; Super-Heterodyne Trouble Shooting
Presenting Experimenter Supreme; Antenna Coupling for Superdyne Set

Radio Digest

EVERY
WEEK

PROGRAMS
Illustrated

TEN
CENTS

REG. U. S. PAT. OFF. & DOM. OF CANADA

Vol. XII

Copyright 1925
By Radio Digest Publishing Co.

SATURDAY, JANUARY 24, 1925

No. 3

RADIO HURTS THEATERS?



Ruth Robinson, who played the leading role "Merely Mary Ann" with the KGO audio players recently.

STATIONS PREPARING FOR ECLIPSE TRYOUT

CHICAGO.—CFCA, Toronto Star, Toronto, Canada, directly in the path of the sun's eclipse January 24, is among the many stations planning to make a complete log and test of the effect of this phenomenon on transmission. KSD, St. Louis, and a score of other American broadcasters will do likewise. The Western Union Telegraph company also will take observations on all of its land lines during this time. The complete story appeared in last week's issue of Radio Digest.

Wells Hawks at WOR

NEWARK, N. J.—Wells Hawks, internationally known press agent, is presenting a series of talks from WOR here.

Betty Bronson, youthful star of "Peter Pan," who told Radiophans all about herself recently through Station WDAE, Philadelphia.

BROADCASTS TAKE PEOPLE FROM SHOWS

Producers in Argument

Some for, Some Against Radiocasts
—McCormack-Bori Concert Starts Heated Discussion

NEW YORK.—Theaters are on the high road to ruin as a result of Radio programs, according to the statements of many aroused theatrical producers and managers, following the first Victor program on the air, with John McCormack and Lucrezia Bori star features.

On the other hand there are those producers such as John Golden, responsible for the greatly successful play, "Lightnin'," who rally to the support of Radio and claim it is the best possible advertisement for a really good play.

Other authorities, speaking as the breach

(Continued on page 2)

URGE BROADCAST OF INAUGURAL ADDRESS

WOULD BE GREATEST LINK EVER ARRANGED

More Than 35 Stations Would Permit Public to Listen in Throughout Country

WASHINGTON, D. C.—An expenditure of some \$20,000 is being urged upon the congressional inauguration committee for broadcasting the inaugural address of President Coolidge on March 4.

While this matter has not yet been formally placed before the committee, there has been considerable discussion regarding it here. The idea of those favoring the plan is to hook up thirty-five or more broadcasting stations, thereby having the biggest hook-up yet arranged so that every boy and girl in the country will have a chance to hear an inaugural address.

There is some opposition among members of Congress to the expenditure of this sum of money, but it has been suggested that part of this at least could be saved in other directions.



Gail Bandell, who is recognized as one of KYW's own staff and one of the Radio headliners.

GOLD AWARD SET IS STILL TO BE FOUND

ENTRIES SO FAR SHOW NO NEW DEVELOPMENTS

As Issue Goes to Press Judges Investigate Carefully Possibilities of Sets Received

What has happened to the much-touted American inventiveness and ingenuity—our ability to devise ways and means of doing something, by means of a new method, better than it has ever been done before? Are those who listen to broadcasting night after night satisfied with their present selectivity and range? So it would seem from the response to Radio Digest Gold Award Set offer.

Receivers have come in—beautiful examples of assembly ability, many unusual in layout or finish—but progress and advance are not shown. This is being written as the issue containing it goes to press ten days in advance of publication date and, unless sets containing genuine contributions to the Radio art and Radio knowledge are received, no prizes can be awarded.

Many Possible Developments

The selectivity of a super-heterodyne can certainly be increased. Several theoretical ways of doing this are well known and only await some one working out the data to make them practical. Tuned Radio frequency, first cousin to the neutrodyne, has only been in use a few months and requires much development before its possibilities will be fully realized. Surely, reflexing, delicate and unstable as it usually is, can be put on a more reliable basis, and its selectivity increased.

As an example of what would have had long and serious consideration: why not two reflexed tubes, a pure Radio frequency tube in front, its grid circuit tuned by a low-loss split secondary coupler as in the hedugen, a small condenser controlling regeneration to lower the effective resistance of the circuit, and loose coupling between primary and secondary?

The technical and Gold Set Award editors have been going over the circuit diagrams accompanying sets to make as easy as possible the work of the judges. Variations of single circuit tuners are eliminated, as are the usual forms of Radio frequency amplifiers. The expected improvement may yet come in.

Budget Bureau Will Study Radio's Needs

May Increase Funds for Pressed Radio Section

WASHINGTON.—No decision has yet been reached by the budget bureau on the recommendation of President Coolidge and Secretary Hoover that an increased appropriation for the Radio service be granted.

Hearings have been held on the matter by budget authorities and it is expected that a report will be made to the president and Congress within a very short time. If the bureau approves the recommendation, it will probably be sent to Congress by the president in the form of a supplemental appropriation which, it is believed will receive favorable consideration.

The House appropriation committee will soon take up the main appropriation bill for the commerce department, in which the Radio section is included. Secretary Hoover and officials of the Radio section are to appear before the committee to tell of the pressing need for an increased appropriation for this service.

Sigmund Spaeth's Parties Will Continue from WOR

NEWARK, N. J.—Another of Dr. Sigmund Spaeth's studio parties is scheduled at WOR here next Monday evening and several well-known figures of the music and theatrical world will be presented to the Radio audience in informal fashion following Dr. Spaeth's weekly review and forecast of important musical events. The series of WOR studio parties has attracted considerable favorable attention and will be continued weekly for an indefinite period.

Government May Soon Give Warnings of Heavy Rains

WASHINGTON, D. C.—It is probable that the department of agriculture will broadcast by Radio to the farmers of the United States storm warnings and reports of heavy rains when crops are growing. This suggestion was made to Secretary of Agriculture Gore, by Senator Harris of Georgia and it is said that the secretary is favorable to the suggestion.

ANN PENNINGTON BROADCASTS



FOR the first time the actual making of a motion picture has been broadcast. Through Station WJZ, the filming of the scenes—or rather, the portions of them that are audible—of the "Mad Dancer" in which Vincent Lopez, orchestra leader, and Ann Pennington, Follies dancer, are playing the leads, are being sent out on

the air, giving the well-known invisible audience an insight into the methods of procedure during the preparation of entertainment for the screen fans. This event is an experiment, and it is hoped that some day it will be possible to broadcast actual scenes. Vincent Lopez is shown here at the left with the baton.

VALENTINE CONTEST IS ON AT GREBE'S STATION

\$1,200 in Prizes Is Offered for the Best Poems

RICHMOND HILL, N. Y.—The "Radio Saint Valentine" of Station WAHG, A. H. Grebe and company here, offers \$1,200 in prizes for the best valentine verses containing the word "Grebe."

The contest will close February 9 and awards will be made on St. Valentine's eve, Friday, February 13, at 9 p. m., eastern time, or 8 p. m. Central time. Verses submitted may be up to fourteen lines in length, either serious or comic. In case of tie, duplicate prizes will be awarded all tying contestants.

The Radio Saint Valentine is on the air every Monday and Friday at 9 p. m., and on Saturday and Monday midnight programs at 1 a. m., eastern time. WAHG broadcasts on 316 meters.

New Train Picks Up WBAP

FORT WORTH, Texas.—Passengers on the new Golden State Limited, crack Rock Island fast train from Chicago to California, have heard clearly the daylight programs from WBAP here. The new train is completely equipped with Radio receivers.

Soap Company Pays Philharmonic's Cost

Los Angeles Orchestra Treat at KHJ January 24

LOS ANGELES.—Probably the most liberal contribution to a paid Radio program in the West, and possibly the United States, will be that of the broadcast of the Los Angeles Philharmonic orchestra on Saturday night, January 24, from KHJ, Los Angeles Times.

Since a few months ago, when the policy of "paid" programs became the rule instead of the exception at KHJ, the size and quality of programs presented has steadily increased, reaching the culmination in this broadcast. The studio at KHJ would not hold the orchestra, consisting of ninety men, satisfactorily and it was necessary to make arrangements to use the auditorium of the First Methodist Episcopal church.

It is understood that the donor of the program, the Los Angeles Soap company, is spending over \$1,200 for this two-hour program, and as KHJ makes no charge for the use of its studio or transmitter, the whole amount will go to the members of the orchestra in payment for the broadcast.

BRUNSWICK MONEY FOR MUSIC MEMORY

\$5,000 WILL BE AWARDED MONTHLY TO WINNERS

Talking Machine Firm to Broadcast Tests Weekly from Chain of Eight Big Stations

NEW YORK.—To foster a deeper understanding and appreciation of good music, the first national Radio musical memory contest will be broadcast from six of the principal stations of the country, starting the evening of February 2, during the "Brunswick Hour of Music" at 10 p. m., eastern time, or 9 p. m., central time.

Everybody in America is eligible to enter. The broadcasting of operatic stars, famous symphonies and foremost orchestra will be done from the Brunswick laboratories in New York city every Tuesday evening and relayed through Stations WJZ, New York; WGY, Schenectady; WRC, Washington; KDKA, East Pittsburgh; KYW, Chicago, and KFKX, Hastings.

Arrangements are being perfected to include soon Station KOA, Denver, and KGO, Oakland, Calif., so as to reach every Radio musical fan from coast to coast.

\$5,000 Monthly in Prizes

Twenty thousand people are expected to take part in this test of music memory, which aside from its educational value will be stimulated by a competition for the winning of cash prizes, totaling \$5,000 monthly. First prize of \$1,000, second \$500, third \$300, fourth \$200, ten of \$100 each and forty of \$50 each. In case of tie duplicate prizes will be awarded all tying contestants.

Lists of musical selections from which the numbers of each Tuesday evening "Brunswick Hour of Music" will be selected will be given in advance. These lists may be obtained in any town or city within the radius of the stations broadcasting the program.

Competitors are not to send in their answers until after the final "Brunswick Hour of Music" program each month.

That people musically inclined who are not fortunate enough to possess Radio outfits may have an opportunity to enter the contest on an equal footing with the owners of sets, arrangements have been made to permit the public to listen in at any Brunswick headquarters Tuesday evenings.

SUMMER NOISES NOT SO NOISY DURING 1924

Dr. L. W. Austin Says Tests Show Marked Improvement

WASHINGTON.—Summer interference conditions have entirely disappeared and Radio is now going through its best period, according to Dr. L. W. Austin, physicist of the bureau of standards.

"The September and October measurements indicate the disappearance of summer conditions," says Dr. Austin. "Both the afternoon fading and the disturbances show a marked decrease much earlier than last year."

"The atmospheric disturbances in September and October have not only decreased in intensity as compared with July and August, but also have changed their character to some extent. The strong crashes which were common during the summer were infrequent in September and October, the disturbances being nearly always the crackling, rumbling type."

Crosley's Five-Kilowatt Plant Soon to Be on Air

CINCINNATI.—It will not be long before the new Crosley WLW five-kilowatt broadcasting station at Harrison, Ohio, is ready for testing. Workmen and engineers are doing everything possible to complete their work.

The new transmitter's panels, six in number, bear the serial number 101, which indicates it is the first one of its type.

Although the new station will work almost automatically, it will require the attention of a thoroughly experienced operator. For that position J. E. Whitehouse has been obtained. He comes to WLW after ten years in the United States Navy as chief Radio man.

Starts Cross Word Song

CLEVELAND.—A broadcasting studio would be the last place one would pick to work cross word puzzles under ordinary circumstances. But at WTAM was where Mrs. Bernard L. Straug chose to work hers. This was while waiting for her husband, who is "Announcer B. L. S." The result was a popular song written by Carmen Lombardo, one of the brothers around which the Royal Canadian orchestra, a WTAM feature, is built. The song is entitled, "Cross Word Puzzle Crazy."

Many new stations of the B type are preparing to go on the air.

THE CAUSE OF ALL THE TROUBLE



Lucrezia Bori and John McCormack, Victor artists who recently sang from WEA and caused the theatrical controversy now on in the East. ©U.&U.

WOC—First Super Power Station on the Air



Where the West Begins, Davenport

By John Galbraith

THE first super-power station to go on the air; WOC, located on the Palmer School of Chiropractic, Davenport, Iowa, has this honor and distinction. New equipment throughout, including the aerial, go towards making WOC one of the finest and best equipped broadcast stations in the country.

The equipment of the new station is the last word in Radio transmitter design. Special water-cooled tubes are used for amplifiers and rectifiers. A stream of water under 24 pounds pressure is continually running around the base of the tubes. The water has an average temperature of 120 degrees Fahrenheit while the tubes are in operation.

A specially designed antenna switch is used so that either the old 1000-watt set or the new 5000-watt set may be switched into operation by merely turning the hand.

A new aerial has taken the place of the one formerly used with the low powered set. This new aerial uses insulators 56 inches long—almost as tall as a man—and about six inches in diameter.

"Ye canna baith be comfortable and gran." This inscription, over the fireplace in the home of B. J. Palmer, owner of the Palmer School of Chiropractic and Station WOC, is the slogan of the station personnel. When a visitor comes to WOC, he is immediately made to feel at home, thereby fulfilling the slogan.

Foremost among the leaders at WOC stands Frank W. Elliott, business manager of the school and full of "pep." He is a great believer in the possibilities of broadcasting—as the station shows—and his personality would win over the most adverse and chronic hater of Radio to the standard of broadcasting.

Stanley W. Barnett, director-announcer, is a former Naval operator, and feels as much at home before the microphone in the studio as he does in the operating room. It was due to Stan's persistent boosting of Radio broadcasting that WOC is in existence today. When he arrived at the school in Davenport, he began to talk about what Radio was and what it could do. Result—WOC.

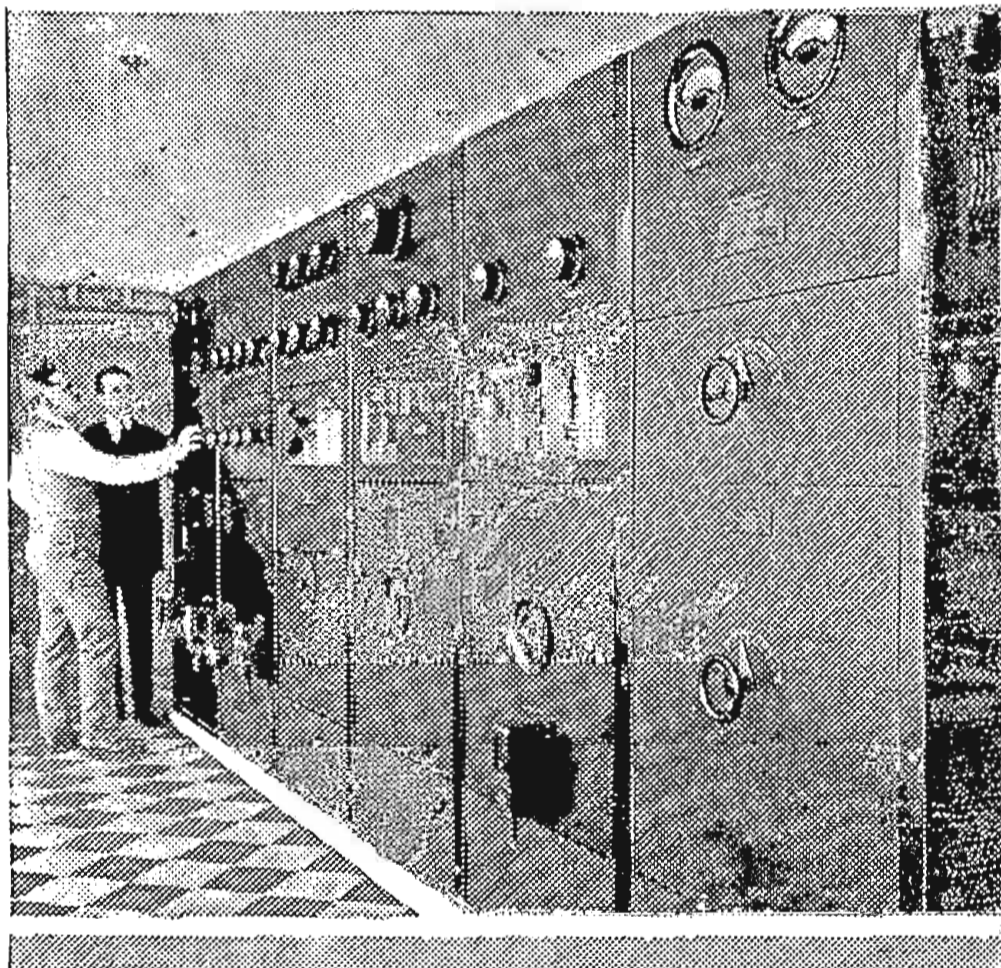
Many novel broadcasting ideas have emanated from his mind and Radiophans throughout the country are indebted to "Stan" for the pleasure that they derive from listening to the programs sent from Station WOC.

The chief operator is Franklin W. Pierce. He has been working in Radio since he was able to walk, and it is due to his wonderful electrical ability that troubles at WOC are kept at a minimum. He is better known to fans as announcer ANR.

Would you like to know how to bake a cake, clean woodwork or take care of children? If so, tune in some morning at 10:00 a. m., and listen to GWW tell just how it's done. GWW, or to call him by the name which he uses in signing checks, Gilson V. Willets, has charge of the far-famed cooking class.

About two years ago, GWW told the ladies one morning about some wonderful cookies which his wife had made—yes, he's married—and invited the listeners to send in their favorite recipes for winning a man's heart. The mail next day to WOC was so heavy that the letter carrier threatened to quit his job. When the letters were opened, recipes poured out onto the table and threatened to engulf the operators.

The recipes have now been published in book form, which is sold by the Palmer school. Another book is now in the process of being assembled and will be published very soon.



Above, entrance to the reception and Radio room where the apparatus for broadcasting is kept. The Radio room holds the old 1000-watt set which has established envious records. Left, panel of the new 5000-watt transmitter at Station WOC. Photo shows Stanley Barnett, director-announcer, tuning set with J. S. Ward, engineer who erected the installation "standing by" and giving expert advice.

Left, Frank W. Elliott, business manager of Station WOC and the Palmer School of Chiropractic. It is due to his foresight and ability that the school is at its present state of perfection. Mr. Elliott is also known to thousands of Radiophans as announcer FWE, and is very popular with them.



B. J. Palmer, owner of Station WOC, is known to the public as B.J. He acts as announcer between trips around the world, one of which he is making at the present time.

In the State Where the Tall Corn Grows



Val McLaughlin brings the sandman to kiddies each evening when daylight steals away. She is a reader of wide renown.

EACH evening comes the sweetest voiced "Sandman" who tells the bedtime stories to the kiddies. Her laugh and voice with a smile is one of the best known in America. She receives thousands of letters from kiddies attesting her popularity. And, to know Val McLaughlin—for that is her name—is to love her.

So popular has this young lady become, that the Brunswick recording company recently requested her to tell some of her stories for the records. These records are now on sale, so that even though Val is not on the air during the day, mothers may put their kiddies to bed to the sound of her wonderful stories.

That programs are well balanced and varied is due to Erwin Swindell, musical director of WOC, who has been with the station since its opening. He is a composer of many famous compositions, and a finished musician. Besides doing all this work at the station, he is organist at the Sacred Heart cathedral and teacher of music in other cities as well as Davenport.

Organ recitals are broadcast direct from the B. J. Palmer residence, where one of the most expensive and finest console pipe organs in the country is located. Frequently Radiophans are given a treat when Clarence Eddy, world-renowned organist comes to the home of B. J. and plays the organ.

Some time during the latter part of 1925, fans will hear the music from one of the largest organs in the world which will be installed in Davenport and broadcast through Station WOC. Many new features will be embodied in the construction of this \$180,000 organ to give it added resources and the greatest possible shading of tone values and orchestration.

The station and the school are decorated throughout in rustic style. Chairs, tables and picture frames are all made of highly polished rustic wood. Along the walls, wherever the visitor turns, are painted epigrams and mottos, collected by B. J., as the owner of the station and school is known to everyone.

Throughout the class rooms of the school, public address system horns have been (Continued on page 18)



Stanley W. Barnett, better known to the listening public as announcer BWS. He is an old time Navy operator and at the present time is director-announcer of WOC. It was due to "Stan's" persistent urging that B. J. Palmer installed a broadcasting station some years ago. Tune in some night and hear him tell about the station "Where the Tall Corn Grows."



Mrs. Elliott, accompanist oftentimes at WOC, can be credited with many original compositions.



Above, Clarence Eddy, the world's most noted concert organist, who plays frequently from WOC. He is known to thousands for his playing.

Gilson V. Willetts, known as announcer GWW. He is operator and announcer between times. Mr. Willetts gives the "Helpful Hints to Happy Homes" every morning from WOC. These hints are now published in book form so that the housewives may keep them for future reference.



Left, Erwin Swindell, musical director and conductor of Palmer School Radio orchestra. Mr. Swindell is the composer of several well-known classical selections. He is personally responsible for the high quality of music sent out from WOC.

Right, Franklin W. Pierce, chief operator and technician, who is sometimes heard from WOC signing off with the initials ANR. When anything goes wrong at the station with the apparatus, they call on Mr. Pierce to fix it.



East ~ West ~ South

You Will Hear These Radio Favorites More Clearly

KPO

On The

WMC

FRESHMAN MASTERPIECE



Fern Bachman is a talented violinist appearing frequently at Station KPO, San Francisco.



The Gypsy String Ensemble entertains the radio audience on Monday evenings from Station WEAF, New York.

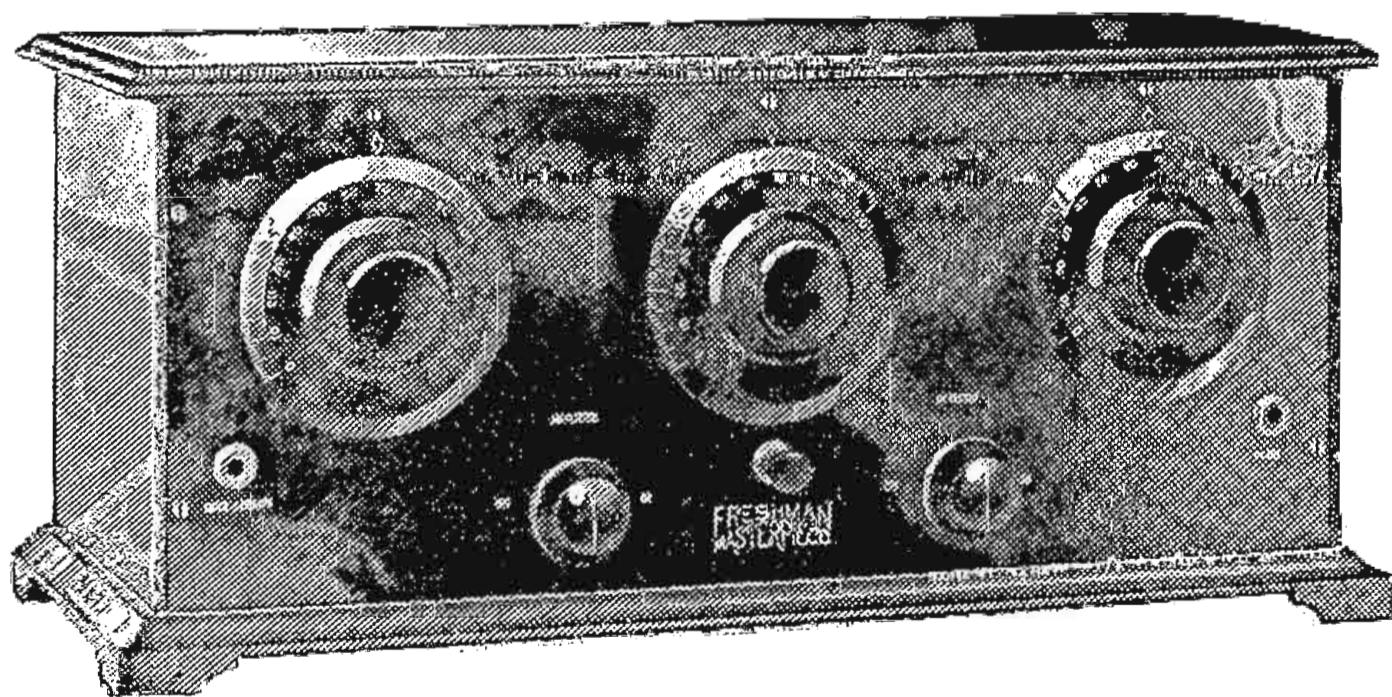


Patrick O'Sullivan is one of the best known pianists in the south. He appears at Station WMC, Memphis.

Five Tube Tuned Radio Frequency

\$60⁰⁰

The Greatest Value Ever Offered in a Radio Receiving Set



Made of the finest low loss materials and in a beautiful, genuine solid mahogany cabinet, that is attractive enough for the most pretentious room, and at sixty dollars, economical enough for the most modest.

The Freshman Masterpiece combines every feature essential to the perfect receiver. Brings in even the most distant stations without a bit of squealing or howling—brings them in night after night at the same points on the dials. And what's more

It's the easiest set in the world to operate.

Have Your Dealer Install One in Your Home!

Every genuine Freshman Masterpiece has the serial number and trade mark riveted on the sub-panel. Sets are not guaranteed if number has been removed or tampered with.

Beware of imitations. Insist upon the genuine. Write for interesting literature.

Chas. Freshman Co. Inc.

Radio Receivers & Parts

FRESHMAN BUILDING
240-248 W 40th St. - New York

REVISED WAVE BAND GIVEN TO AMATEURS

COMMERCIAL STATIONS TO GET 105-110 METER RANGE

Department Urges Abandonment of Spark Transmitters—"Z" Calls Go Into Discard at Once

WASHINGTON.—Under the revised regulations governing amateur Radio station operations, just issued by the department of commerce, amateurs must cease using the wave length band between 105 and 110 meters. This range of waves is being taken up by commercial and government stations.

Radiophone, spark and ICW transmitters may be used only within the band from 170 to 180 meters, but CW transmission may be carried on within the following wave channels: 4.69 to 5.35; 18.7 to 21.4; 37.5 to 42.8; 75 to 85.7 and 150 to 200 meters.

Abandon Spark Transmitters

The department urges the abandonment of the spark transmitter as soon as possible and the adoption of sets causing less interference. No new restrictions will be imposed relative to the character of the power supply, the department regulations state, provided the emanated wave is sharply defined and the power does not exceed 500 watts, set by law.

Amateurs using the band between 150 and 200 meters, which includes all spark, phone and CW transmitters, are required to remain silent every night between 8 and 10:30, local time, and on Sundays during church service broadcasting. Stations using wave lengths below 85 meters and having a pure continuous wave, or where full wave rectification is employed are not required to remain silent, except where interfering with other Radio services.

Abolish Special Licenses

Special amateur licenses are abolished, but owners of stations so licensed may continue to use their "Z" calls under new regular amateur licenses. No more special "Z" licenses will be issued, as the department feels that there is no longer need for them.

Amateur stations are not permitted to communicate with commercial stations unless so authorized or in emergencies.

These rules go into effect immediately.

WTAR IDENTIFIES MYSTERIOUS MAN

"Oxekula," by Broadcast, Found to Be Finnish Naturalist Far Astray

NORFOLK, Va.—Oxekula, mystery man, who acquired nationwide publicity recently, has had his mystery solved. Radio broadcasting through WTAR here and a listening near-countryman are responsible.

Oxekula, in detention in the city jail and later at the Union mission here, who could not make himself understood, proved to be a middle-aged Finnish naturalist and writer, far astray from his home in Boston, Russia—not New England. He had heard tales of the wonderful plant life in America and the Orient, and, forgetting to bid his aged wife goodbye, shipped aboard the S. S. Riga as a sailor.

But the rest of the sailors didn't understand the queer old man's love of flowers and plants—they ridiculed him and mistreated him. The Riga touched Canada, then came to the United States. Oxekula took shore leave in some city here, he knows not where, and became lost. He walked and walked, sometimes being given food by kind persons, all of whom invariably thought him out of his head.

Then the Norfolk authorities picked him up. He is in good hands now—thanks to Radio—and will soon be deported, according to his wishes, back to Boston, Russia, where an old woman is probably mourning his death at the hands of the Bolsheviks.

New Daylight Record

FORT WORTH, Texas.—That WBAP, the Star-Telegram here, has established a daylight record for voice transmission is now believed. H. R. Lovell, Keystone, Canada, at 9 a. m., mountain time, heard the entire market report on November 20, approximately 1,200 miles. Reception of WBAP is also reported by L. L. Donaldson of Papeete, Tahiti, in the middle of the Pacific ocean, about 5,000 miles from Fort Worth. Mr. Donaldson used a five tube set.

Like WLW Dinner Programs

CINCINNATI.—Many letters have been received at WLW here following the first of a series of dinner hour programs given by the Selinsky quintet and assisting artists through the courtesy of the Cincinnati Post. The programs are broadcast every evening except Sunday and Friday, at 6 p. m., Central time.

"C.B.L." AND "W.R.S." POPULAR WBAP MEN



C. B. Locke and W. R. Sullivan, well-known Radio announcers at Station WBAP, Fort Worth, Texas.

By Susan Haymes

FEATURING Locke and Sullivan:

Sounds like participants in a fistic encounter, doesn't it? But these popular announcers, C. B. Locke and W. R. Sullivan of WBAP, Fort Worth, Texas, possess anything but pugilistic proclivities.

Locke, aside from being WBAP announcer de luxe, is Radio editor of the Star-Telegram. His initials are C. B. L.—easy to remember, and so is he. His is the voice most often heard from the station's remote control at Crazy Wells hotel, Mineral Wells, Texas, and elsewhere.

C. B. L. is a Texan by choice. His first announcing was done in Kentucky—that land of corn, colonels and fair women. Undoubtedly he kept folks awake with his "announcing" in those days, too! His education was completed at Texas Christian university at Fort Worth, Texas, he decided, had beautiful women, too, so he married one of them.

W. R. Sullivan is announcer and operator. To be an operator of a first-class station requires ability. He must have the patience of Job, the mind of a genius and be as tactful as a diplomat. W. R. S. is all of this.

As announcer for market quotations and weather reports, his services are an invaluable aid to scores of listeners in Business men in Oklahoma and Texas depend on his reports, clearly enunciated, on cotton, grain, livestock and other commodities. Buying is regulated by the market information obtained from WBAP.

Mr. Sullivan was born in Galveston, the bustling seaport of Texas; he spent his carefree boyhood days enjoying the Gulf, watching the breakers roll and men go out to the sea in ships. What a delightful and inspiring atmosphere for a dreamer! For dreamers it took to visualize Radio and vision it takes to improve the science.

W. R. S. believes in two things, work and silence. Unusual characteristics for an announcer, eh? He doesn't talk much,

TRADE COMMISSION TO TAKE TESTIMONY

WASHINGTON.—It is understood that within the next few days the Federal Trade commission will announce the date for beginning the taking of oral testimony in its case against the Radio Corporation of America. It is expected that the hearings will be held in several of the larger cities. Edward L. Smith, special attorney for the commission, is in charge of the work, which will take time.

but work he is always doing; ever busy in his unending quest for improvement of WBAP, tackling new hook-ups in his leisure or building a new set, only to sit up until 2 a. m. to see if "she works." The arrows of Cupid haven't struck Sullivan yet. We trust this plain statement will not cause an influx of letters—for as stated above, W. R. S. loves silence—he doesn't want a loud speaker in the house.

WLW Adds Portable Stage

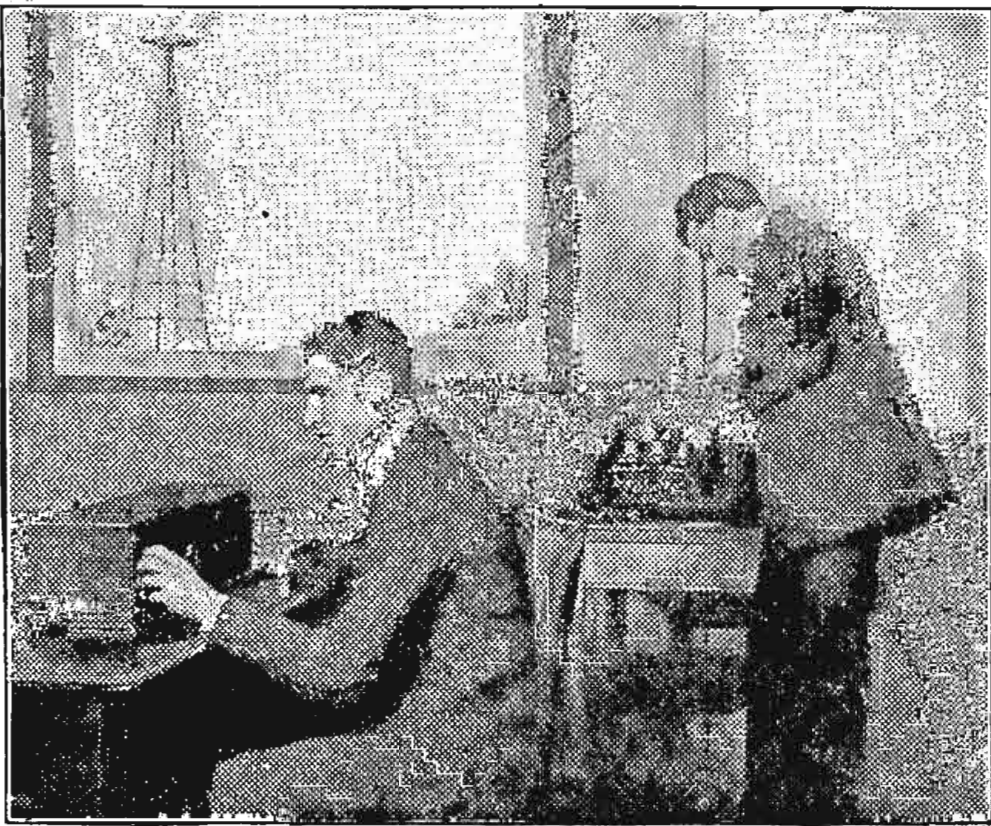
CINCINNATI.—It has been announced from the Crosley WLW studio that a portable stage has been added as part of the equipment. It is possible to see the solo and ensemble studios of WLW from the auditorium, which has a seating capacity of 200. A portable stage two feet high and is now used when occasion demands.



I am averaging anywhere from \$75 to \$150 a month more than I was making before enrolling with you. I would not consider \$10,000 too much for the course.
(signed) A. N. Long, Greensburg, Pa.



No sooner had I received my discharge (as a buck private) than I opened a radio shop of my own. I earned over \$3,500 in 1 year. I wouldn't have missed the N. R. I. course for a million dollars.
John P. Zinno, Corona, L. I.



Before I enrolled with you I was making \$15 a week on a farm. Now I earn from \$2,080 to \$4,420 a year. And the work is a hundred times easier than before. Since graduating a little over a year ago, I have earned almost \$4,000 and I believe the course will be worth at least \$100,000 to me.
(signed) Geo. A. Adams, Tamaqua, Pa.



I can very easily make double the amount of money now than before I enrolled with you. Your course has benefited me approximately \$3,000 over and above what I would have earned had I not taken it.
T. Winder, Grand Junction, Col.

Prepare Yourself For Radio — the New Profession

Many N.R.I. Graduates Now Earning From \$50.00 to \$200.00 a Week

THE biggest, best-paying field open to ambitious men today. Thousands needed at once for pleasant, interesting jobs. High Pay—Short Hours. No experience required. Learn in your spare time at home.

Here is work that is fascinating, new and easy—an industry which is growing more rapidly than any other in the world today—an industry that offers you the chance of a lifetime to "get in on the ground floor" and make big money. Right now, thousands of trained men are needed in all branches of the business. Radio operators, radio engineers, salesmen, mechanics and Radio executives are scarce and receive wonderful pay. Are you going to shut your eyes to this golden opportunity when there is a quick, easy way to get one of these splendid positions?

You can train for this "big money" field right in your own home—in your spare time. No matter how little you know about electricity or Radio, the National Radio Institute—the largest and best school of its kind in the world—will guarantee to give you a thorough Radio training in a few short months.

Salaries Doubled and Tripled

Since the National Radio Institute was founded in 1914 over 15,000 men and young

men have taken this short-cut to Success in Radio. They are enthusiastic about this wonderful course.

E. W. Barnes, Norfolk, Va., writes: "During my spare time, I make about as much repairing radio sets and building them as my regular salary."

In a letter from Arthur Ruse of Toronto we read that he has doubled his income since mastering Radio and that he earns from \$50 to \$100 a month in his spare time.

This page contains only a few of the thousands of letters we receive from successful graduates. Hardly a week goes by without our receiving urgent calls for our graduates. "We need the services of a competent Radio Engineer."

"We want men with executive ability in addition to radio knowledge to become our local managers." "We require the services of several resident demonstrators"—these are just a few small indications of the great variety of opportunities open to our graduates.

This is an absolutely complete Radio Course which qualifies you for a Government First Class Commercial License and really gets you the bigger paying jobs in Radio.

Send Today for Free Book and Special Short-time Offer

Don't rely on this announcement for a true picture of the opportunities in Radio. Simply mail the coupon and we will send you a big free book "Rich Rewards in Radio," which will show you actual proof of the big money being made by our graduates today. It will describe the course in full detail, it will tell you just how much you can earn in this fascinating profession. Best of all, you will get the details of our Special Reduced rate which is being offered for a short time. So, mail the coupon now! Make this your lucky day!

THE National Radio Institute Dept. 55XB WASHINGTON, D. C.

Study in Your Spare Time at Home

This is the time to go into radio. Big opportunities are now open in every branch of the work, and salaries were never so high. The thing to do is to begin studying at once, in whatever time you can spare, so that you will be able to qualify for the position you want when the time comes. Only an hour or so every evening will quickly prepare you for radio—a profession you cannot fail to find fascinating and pleasant. Don't handicap yourself; start at once and advance with the others.

THE NATIONAL RADIO INSTITUTE, Dept. 55XB, Washington, D. C.

I am interested in radio as a profession. You may send me, free and without obligation, your interesting book, "Rich Rewards in Radio," all information about your spare time, home-study plan and about your free employment service. Also, the details of your Special Offer.

Name.....Age..... Street..... City..... State.....

AN EVENING AT HOME WITH THE LISTENER IN (SEE INSTRUCTIONS FOR USE BELOW)

Table with columns: Station and City, Met., Saturday, Sunday, Monday, Tuesday, Wednesday, Thursday, Friday. Lists radio stations and their broadcast times.

Instructions for Use.—All the hours above are given in Central Standard Time. If your city uses Eastern Time, add one hour to each of the periods stated; if your city uses Mountain Time, subtract one hour; if your city uses Pacific Time, subtract two hours. This table includes only the evening Radiocasts, and, on Sunday, the late afternoon program.

STATIONS IN ORDER OF WAVE LENGTHS USED

Table with columns: Meters Call, Meters Call, Meters Call, Meters Call. Lists stations grouped by wave length.

Advertisement for EISEMANN MAGNETO CORPORATION. Features an illustration of a radio set and text: 'Attractive Appearance', 'Type 6-D is encased in a substantial mahogany cabinet...', 'Price \$125.00 without accessories', 'EISEMANN MAGNETO CORPORATION', '165 Broadway, New York', 'DETROIT SAN FRANCISCO CHICAGO', 'Authorized Distributors EISEMANN in Principal Cities', 'EISEMANN ELECTRICAL EQUIPMENT', 'KESTER Radio SOLDER ROSIN-CORE', 'Ohboy! but it wins Approval', 'Jack Binns knows, and here's what he says in Collier's: "Never use any of the messy soldering pastes. This is quite important, because it causes a lot of noise in your reception. The only material to use is rosin. Suitable strip solder can be obtained with a rosin core which makes the task of soldering a simple one."', 'CHICAGO SOLDER COMPANY, 4235 Wrightwood Avenue, Chicago, U. S. A.', '25¢ for full size can', 'CHICAGO SOLDER COMPANY, 4235 Wrightwood Avenue, Chicago', 'Gentlemen: Please send me one can of KESTER RADIO SOLDER for which I enclose 25 cents in stamps. (Postpaid in U. S. A.)', 'Name', 'Address', 'City', 'State', 'Dealer'.

WCCO,
WMAQ;

WDAF;
AU; 6:45,
I, WGY,
GR; 7:20,
C, WOC;
Z, WLS,
HJ, KOB;
5, WHN;

5), 9:30 p. m.,
p. m., Bernie
Connor and his
novelty numbers,
p. m., college
pp; 8:15, musical
9.9), 11 a. m.,
m., Wanamaker
Golden, director;
), 7 a. m., gym
k, pianist; 3:30,
"Radio for the
music White You
chestra.
), 7 p. m., pro-
from Hannibal,
1-12 m., "Some
Erna Bertrams;
pring," Eleanor
1," Edward L.
aking," H. E.
for Home Build-
or Home Light-
concert, Ralph
chestra; Manuel
lmer, contralto;
Ralph Williams
es; Axel Chris-
o; Hill, Hirsch,
rgy McClure,
8:15-9:45 p. m.,
quartet; S. Ray
one; Mrs. Carl
entertainment:
3-9, Dr. Charles
concert, Mrs.
45-7:45 p. m.,
jaeffery, pianist;
3 p. m., The
etroit News or-

30

KIS, KPO,
DBY, WEAO,
I, WOI, WRC,
1:45 p. m.,
lo lessons.
30 p. m., "The
C. B. Grant;

7:30 p. m.,
sical program;
1 his Rainbow

), 7:30 p. m.,
boys' band of

0 p. m., Luigi
ncert orchestra;
anada," "Men
t," "Dear Little
r," Eva War-
land Misenner,
ow Sleeps the
to; "Song of
uet," "Miscere
gton and Bran-
ill the Glass,"
netta," "Serenade,"
Moon of My Delight,"
ade," Mabel F. Downing,
Eva Warrington, soprano;

"Mother My Dear," "My Life Has Crept," George
Aldcroft, baritone; viola solo, Eiland Misenner; "Linden
Lea," "Noah's Ark," Marion Copp, contralto; quartet,
"Good Night Beloved," 9, address; 10:30, Luigi
Romanelli and his King Edward hotel dance orchestra.
KDKA, E. Pittsburgh, Pa. (Eastern, 309.1), 7 a. m.,
morning exercises, O. Shannon; 8, morning exercises;
12:20 p. m., Sunday school lesson, J. C. Mace, W.
M. C. A.; 6:15, concert, Charlie Gaylord's orchestra;
7:30, children's period; 8:15, address, University of
Pittsburgh studio; 8:30, concert.
KFAE, Pullman, Wash. (Pacific, 330), 7:30-9 p. m.,
Harvey Wilson, tenor; Danac Llesay, pianist; Erna
Nelson, reader; "Reading in Preparation for Travel
in Europe," Carl M. Brewster; "Essentials of Success-
ful Farm Management," George Severance; "Survey of
New Books," Alice L. Webb; "First Care of Baby
Chicks," W. D. Buchanan.
KFAU, Boise, Idaho (Mountain, 275), 8 p. m., Ed.
Hoffman, baritone; Mrs. Fred Rankin, soprano.
KFDM, Beaumont, Tex. (Central, 315.6), 8 p. m., refinery
band.
KFI, Los Angeles, Calif. (Pacific, 469), 5-5:30 p. m.,
Evening Herald, table talk and news; 5:30-6, Exam-
iner's musical half hour; 6:45-8, Aeolian residence
pipe organ recital, Dan McFarland, organist; 8-9,
Evening Herald, dance music; 9-10, Examiner, vocal
and instrumental; 10-11, Harmony trio, Amadeo Reno,
violinist, and Carolina Reno, pianist.

(Continued on page 14)

6:30,
Kpo,
9:05,
Wjz,
Webb,
10:15,
Whn,
Kyo,
Kgo,
29: 8,
Whn,
Wex,
Wdar,
9:30,
Wnj,
Ksmd,
10:30,
Wnj,
Webb,
11:45,
Kbj,
12:05,
Kyo,
Kgo,

Louange; 8, Canadian National Railway's program
from Fort Garry hotel.
CNRC, Calgary, Can. (Mountain, 430), 9-11 p. m.,
weekly travel tales, "Johnny and Jenny Jingles" and
youthful C. N. R. travelers; Canadian National Rail-
ways Symphony orchestra; George Boothman, baritone.
CNRW, Winnipeg, Man. (Central, 450), 8:15 p. m.,
bedtime travel tales; 8:30, The Melody Three, Elisa
Brault, soprano; Lucia Hart, contralto; Margaret
Fletcher, accompanist; "The Functions of an Express
Foreign Department in Overseas Trade," dance pro-
gram, Frank Wright's Country club dance orchestra.
KDKA, E. Pittsburgh, Pa. (Eastern, 309.1), 12:20 p. m.,
Institute from Trinity church; 6:15, concert, KDKA
Little Symphony orchestra, Victor Saudak, conductor;
7:30, children's period; 8, program; 8:30, concert; 11,
concert, Pittsburgh Post studio.
KFI, Los Angeles, Calif. (Pacific, 469), 5-5:30 p. m.,
Evening Herald, table talk and news; 5:30-6, Exam-
iner's musical half hour; 6:45-7, Y. M. C. A. speaker;
7-7:30, dance orchestra; 7:30-8, Retta King Nelson,
mezzo-soprano; Philip Musgrave, cello; female quartet;
8-9, program, Standard Oil company of California;
9-10, Examiner, program, Zoellner Conservatory of
music; 10-11, vocal and instrumental.
KFKU, Lawrence, Kans. (Central, 275), 6:50 p. m.,
piano tuning-in number; 7, music, Prof. Waller Whit-
lock, tenor; university string quartet; 7:15, "Amer-
icanization," Prof. F. W. Blackmar; 7:30, chemistry

dinner concert, William Penn hotel; 7:30, Uncle Ray-
bee; 7:45, special feature; 8:30, concert; 10, concert,
Goodrich Silvertown orchestra.
WCAL, Northfield, Minn. (Central, 360), 9 p. m., musi-
cal program.
WCB, Zion, Ill. (Central, 344.6), 8 p. m., mixed quartet;
trio, Miss Hollingshead, Mrs. Hire, Mrs. Huth; Mrs.
Carl Huth, harpist; Miss Hollingshead, flutist; Mrs.
L. J. Hire, violist; Daniel Mason, trombonist; Mr.
and Mrs. R. M. Steel, tenor and soprano; Joseph
Bishop, baritone; Mrs. S. D. Inman, soprano; Dorothy
Schad, pianist; Mrs. Hulda Klammer, reader.
WCCO, Minneapolis-St. Paul, Minn. (Central, 419.3),
10:45 a. m., home service, Betty Crocker; 2 p. m.,
"The Popular Concert," Mrs. Agnes Fryberger; 4,
magazine hour, "William the Conqueror: Part One,"
5:30, children's hour, Gold Medal lady; 6:30, dinner
concert, Dick Long's Nankin cafe orchestra; Kater
Brothers quartet; 7:45, "True Value of Arctic Work,"
Donald McMillan; 8-9, musical program; 10, dance
program, Dick Long's Nankin cafe orchestra.
WCX, Detroit, Mich. (Eastern, 516), 4:15 p. m., music;
6, dinner concert, Book-Cadillac hotel; 7, musical
program.
WDAF, Kansas City, Mo. (Central, 414.1), 3:30-4:30
p. m., the Star's Radio orchestra; 6-7, school of the
air, piano tuning-in number on the Duo-Art; Cecile
Burton, reader; address, one of a series of book talks,
Louis Mecker; the Tell-Me-a-Story lady; music, Hotel
Muehlbach Trlanon ensemble; 11:45-1 a. m., night-

Ellen Rose Dickey; 6:25, Ralph Emerson, organist;
6:50, Senate theater studio; 7, "Tom Thumb," Ford
and Glenn Woodshed theater; 7:20, WLS theater pre-
sents operetta, "The Isle of Asuvere."
WLW, Cincinnati, Ohio (Central, 423), 8 a. m., physical
exercises, William Stradtman; 12:15, noon-day con-
cert; 4, French lesson, Madame Ida Telmpidis; piano
recital, Adelaide Apfel; 6, dinner hour concert, Cin-
cinnati Post, featuring Seifsky quintet; 10, three-
minute message, Civil Service Department of United
States; 10-03, Cooper corporation concert, featuring
Cooper orchestra, directed by Wm. Stoess; male quartet;
Richard Pavey, first tenor; Ferd Raine, second tenor;
Herbert Schatz, baritone; Howard Fuldner, bass; Grace
Raine, accompanist.
WMAK, Lockport, N. Y. (Eastern, 265.5), 12 midnight,
Murray Whitman's Midnight serenaders.
WMAQ, Chicago, Ill. (Central, 444.8), 4 p. m., house-
hold hour, Mrs. Elizabeth O. Hiller, director; 4:30,
Illinois Federation of Women's clubs; 6, Chicago
theater organ recital; 6:30, Hotel LaSalle orchestra;
8, banquet of the Chicago and Cook County Bankers'
association; 9, lecture, University of Chicago; 9:15,
Walters league program.
WMC, Memphis, Tenn. (Central, 503.9), 8 p. m., bed-
time story, Uncle Joe; 8:30, Hotel Gayoso orchestra.
WNYC, New York, N. Y. (Eastern, 528.8), 7:35 p. m.,
sports, Thornton Fisher; 8, program, citizens and
officials of Borough of Queens; 8:30, Queen's night;
10:35, Queen's night.

OPERATING AND TROUBLE SHOOTING

For the Owner of a Radiola Super-Heterodyne

RADIOLA Super-heterodyne is a Radio broadcast receiving instrument, utilizing the super-heterodyne principle, which provides unusual simplicity of operation, selectivity and sensitivity. The cabinet contains the operating mechanism and the battery equipment, as well as a loop antenna, making the set self-contained. It is designed for reception over the broadcast wave length band 220 to 550 meters.

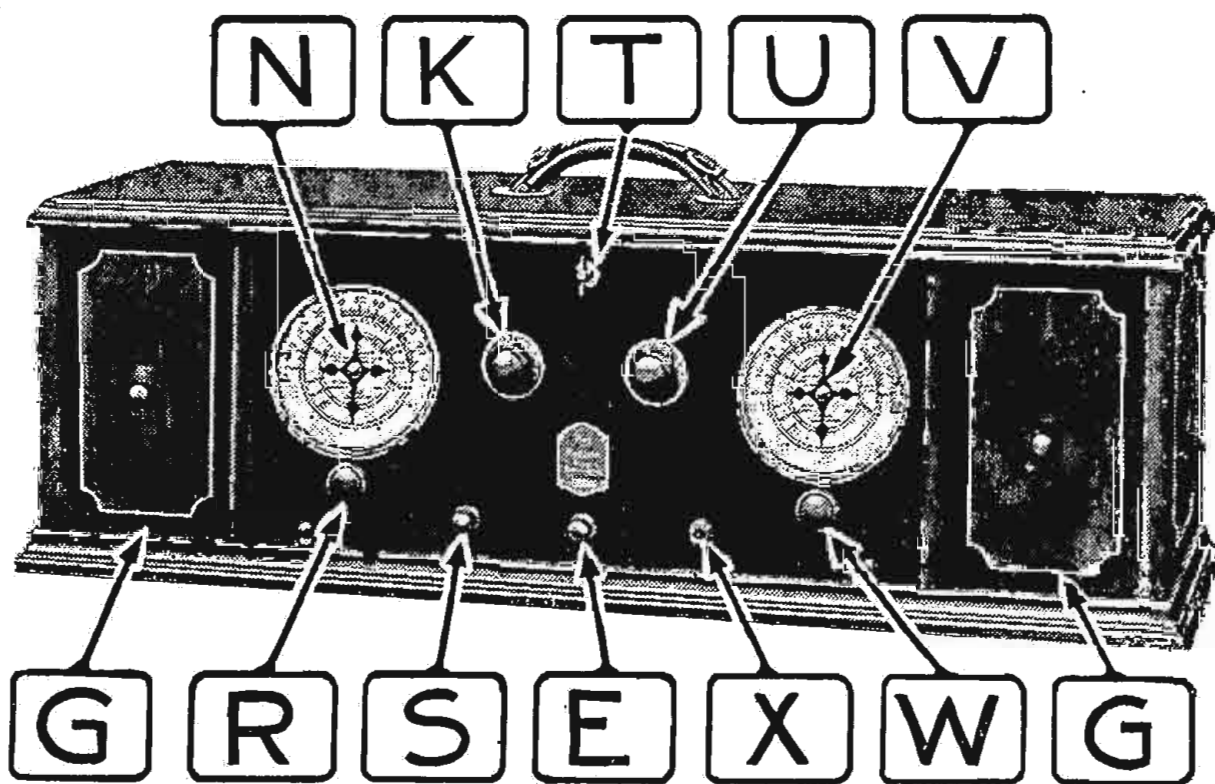
Additional Equipment Required

In addition to the Radiola Super-heterodyne, there will be required the following apparatus: 6 vacuum tubes, model UV-199, 1 loud speaker, 1 telephone plug, 1 set of A, B and C batteries. The A battery may be composed of six ordinary dry cells, 1½ volts each, for lighting the filaments. They should be connected in two parallel groups, each of three cells in series. For the B battery, four 22½-volt plate batteries connected in series, or two 45-volt plate batteries may be used, if desired. The C battery is to be one of the customary 4½-volt units measuring 4 by 3 by 1½ inches.

Access to the space provided for the A and B batteries is secured by pulling on the knobs on the two small end doors and removing these doors. An envelope containing four short and two long jumper connectors will be found inside.

Connecting Batteries

Connect two B batteries in series, using one of the long jumper connectors, fastening one end onto the "+22½ V." terminal of one battery, and the other end onto the "-" terminal of the other battery. (Should the large size 45-volt blocks be used, the two jumper connectors will not be needed.) Connect these batteries to the set, fastening the lead marked "+B", coming through the hole in the side of the battery compartment onto the battery terminal marked "+22½ V.", as yet unconnected; (or onto the "+45 V." terminal of the 45-volt battery if one is



used). Connect the other lead marked "-B" onto the "-" terminal of the other battery. Stand the batteries (or battery) on end and place them in the compartment, pushing them into the corner as near toward the center of the set as possible.

Connect three of the A dry cells in series, using two of the four short jumper connectors. Connect the lead marked "+A" to the center binding post (not yet connected); and connect the lead marked "-A" onto the outside binding post (not yet connected). This procedure with A and B batteries is to be followed in each end of set.

Place the C or grid bias battery in the compartment at the rear of the central section of the set. Connect the lead marked "+C" to the "+" terminal on the battery; and connect the other lead marked "-C" to the "-4½ V." terminal of the battery.

With the batteries installed and connected, replace the battery doors. Radiola super-heterodyne may now be located in any part of the home, convenient and

desirable to its owner. It need not be located in any particular place or turned in any particular direction with respect to the room or to the received signal.

This super-heterodyne utilizes six tubes, model UV-199, which should be handled with due care. Pull the Radio panel forward to the half open position, allowing it to rest against the stay joint.

Before inserting the tubes, turn the "battery setting" knob K to "off" or push in the filament switch E in the lower center of the panel. Remove the six vacuum tubes from their individual cartons. Insert one in each of the six tube sockets by placing it in the socket, turning the tube until the pin in the base drops into the slot, and then turning slightly to the right. Swing the panel back in place and lock it, using the latch T.

Operation

Pull out the filament switch E. Turn the "battery setting" knob K clockwise from "off" toward "100." With new bat-

teries, the pointer should be set approximately 40 to 50 on the dial. As the batteries grow older, this setting must be gradually advanced toward "100." Turn the "volume control" knob U clockwise from "soft" to "100." Push in the jack switch S, which puts the output of the second stage amplifier into the loud speaker.

The tuning of Radiola super-heterodyne involves only the manipulation of the two "station selector" knobs R and W—a simple operation if the principle described below becomes thoroughly understood.

The two gold-tipped pointers have approximately the same settings, i.e. if one is set at 10 or 30, etc., the other is at or near 10 or 30, etc.

When searching for stations, the settings of which are not known, proceed as follows: Set "station selector I" gold-tipped pointer N at, say, 10 (referring to the metal dial scale under the paper scale). Move "station selector II" gold-tipped pointer V slowly over the scale near 10, say from 5 to 15. If no signals are heard, there is no station working on that wave length. Then set "station selector I" pointer at say 12, and slowly move "station selector II" from about 7 to 17. If again no signals are heard, set "station selector I" gold-tipped pointer at, say, 14, and move "station selector II" slowly from about 9 to 19. If still no signals, repeat this process increasing the setting of "station selector II" in small steps until the whole scale has been covered. It will be noted after the first few trials that when "station selectors I and II" are in resonance, a slight breathing sound is heard, indicating that the set is working properly and in resonance.

After hearing a signal, carefully adjust both "station selectors I and II" to best result. If no stations are heard, the set should be turned on the table 90 degrees from where it was during the preceding adjustments, and the tuning process just described should be repeated.

As Radiola super-heterodyne is a very sensitive receiver, it is often found advisable to reduce the loud speaker volume. This may be accomplished by employing one or all of the following methods:

(Continued on page 20)

Ready to Mail!

Ryan's Simplest Possible Super-het Manual

The Simplest Possible Super-heterodyne

Price 50¢

Full Size Drilling Templates Complete Testing Instructions

Radio Digest Publications 510 N. Dearborn St., Chicago

50¢

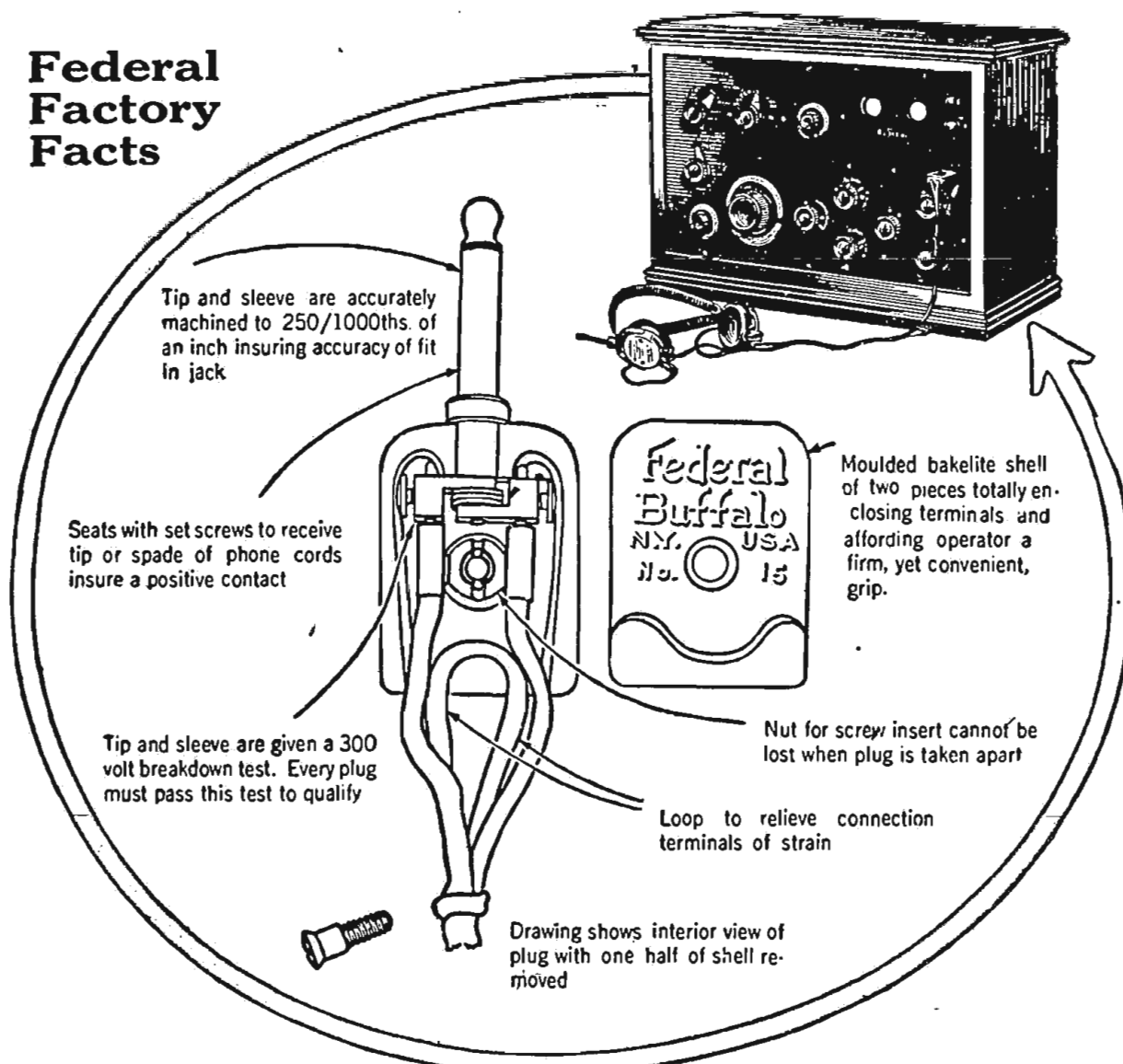
Full Size Drilling Templates—Loop Aerial Construction

ANYONE who has built a crystal set or single-tube can follow Mr. Ryan's concise, simply worded instructions and enjoy the range available only from a super-heterodyne. Every wire, every lug, is placed by his directions and you cannot go wrong.

The construction of loop aeriels, storage "B" batteries, a charger and even the cabinet are gone into thoroughly. This manual covers the complete installation of a selective, quiet, long range Radio outfit. Send money order, stamps or currency to

Radio Digest Publications
510 N. Dearborn St. ~ Chicago

Federal Factory Facts



The plug is the KEY that unlocks the full possibilities of your receiver. No matter what you are getting off the air, you HEAR only what the plug lets through.

Buy a No. 15 Federal Plug for your radio phones or loud speaker if you want to know what your radio set can give you.

Buy a Federal Plug today—also take advantage of the other 130 standard radio parts sold under the same Federal iron-clad performance guarantee.

FEDERAL TELEPHONE MANUFACTURING CORP.
Buffalo, N. Y.



Federal
Standard RADIO Products

BOSTON PITTSBURGH NEW YORK SAN FRANCISCO PHILADELPHIA BRIDGEBURG, CANADA CHICAGO

Radio Digest

PROGRAMS
Illustrated

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

E. C. RAYNER, Publisher

Eastern Office, 611-12 Times Bldg., Times Sq., New York;
Telephone Bryant 4909, 10462

Member of the Audit Bureau of Circulations



241
PUBLISHED WEEKLY

SUBSCRIPTION RATES

Yearly In U. S. and Possessions and Canada, \$5.00
Foreign postage, \$1.00 additional. Single copies, 10 cents.

Vol. XII Chicago, Saturday, January 24, 1925 No. 3

Publicity Broadcasting

Field for Reaching Buyers Great Advertisers Think

FRENCH advertisers are beginning to wonder what is the best means to reach the wide field of sales prospects among Radio listeners. This has been a problem wherever broadcasting exists. A station has a multitude of purposes. The manager is supposed to be a conductor of opera, an educator, an editor, a private entertainer, a director of an orchestra and a music hall manager, and last of all advertisers would make him sales campaign manager.

The Frenchmen think that in using a station for advertising, or other publicity, that this would be a cure for their ills in financing the broadcasting of programs.

Spain has a law which controls the amount of advertising or other publicity which may be broadcast by Radio. Only five minutes of this advertising is permitted for every hour of operation.

As it happens America has no law or regulation on things to broadcast, neither does it have a tax on sets. Very little advertising passes through the air. Americans do not stand for anything out of order. The public would not stand for advertising slides in motion picture houses, neither will they stand for the same thing coming through the air. To tax a set is the wrong way and some other means must be sought.

Radio Classes

To Which of Three Classes Do You Belong?

THERE are three distinct classes in Radio. These may be applied to fields other than Radio and can be classed generally under the headings, mildly interested, technically inclined and hobby riders. Translated into Radio terms, these distinctions mean the owners of manufactured sets, experimental listeners and the amateurs who do not only receive but transmit as well.

If you belong to any one of these groups you are a member of the Radio fraternity, but your ability to hold your own conversation with a group of Radiophans depends entirely on whether you have taken the first, second or third degree. To be merely the owner of a receiving set, without knowing the first thing about its construction, admits you into the circle. However, you cannot get farther without the ability to converse in terms of hook-ups.

In order to get the most out of Radio, if one seeks more than the ordinary entertainment and educational advantages, it is necessary to go through all of these stages. The amateur game represents the limit that can be reached while maintaining an interest in Radio as an avocation. Amateur Radio, when one has mastered the code and a certain amount of technical knowledge, admits one to the greatest thrills in Radio, the exchange of personal messages over distances limited only by the world itself.

All Kinds of Receivers

Anything from a Flivver to a Rolls Royce

THERE are many types and classes of Radio sets as there are motor cars. There are broad principles of design that must be followed in all sets. In addition to the necessary parts there are many refinements and improvements which are found in the better class sets.

Fifteen years ago automobiles were sold without top, windshield or side curtains. The "unnecessaries" were available, but at a higher price. Today a good automobile is really not complete unless it has a closed body, balloon tires, speedometer, bumpers and countless other refinements that we now look upon as things which should go with any good car.

Likewise, in the early days of Radio, an amplifier and loud speaker was looked upon as an admirable equipment for the scientific laboratory, but beyond the hopes of the amateur enthusiast. Today almost any Radiophan contemplates a ten tube super-heterodyne with considerably less emotion than we used to display toward the first quick detachable tire. So when you buy a Radio set remember that you have the opportunity to purchase anything from a flivver to the Rolls Royce of Radio; your choice depending on your needs—and also your purse.

RADIO INDI-GEST

At Raquette

Still, so still that the creaking boot
Shrieks loud on the frosty night;
Cold, so cold that the shivers shoot,
And your skin is shrivelled tight.

Dull, so dull that your way grows slouch,
A face from the morgue you wear.
Sour, so sour, you enjoy a grouch—
You're a brother to the bear.

Home, a joke in a twisted shack,
That shakes like a shimmie flirt.
Jail, yes jail, where the big woods crack,
Twelve months in a flannel shirt.

Song! What th' 'ell! (you have just tuned in)
A song, and you see some bird.
Sweet, so sweet that it smoothes your skin,
And you eat it word by word.

Jazz! Oh, jazz! how it spreads your chest,
Some pep, how it warms your veins.
Lights, white lights with the mirth and jest,
And the music, songs and Janes.

Laugh, you laugh, and you tilt your chair.
You're back with the mob you know.
Jokes, new jokes, and you rough your hair
At the old time minstrel show.

Swift, so swift they have dumped the load,
The waves that have thawed the heart.
Far, so far on the measured road,
But a breath of time apart.

Home, back home, you are chummy now,
An ear to the outside world;
Sing, you sing, and you hold no row,
And your flag, old grouch, is furled.
CHARLES HOWARD SCANLAN.

Dusting a Few Good Ones

ONE THAT ABE MARTIN OVERLOOKED
The other day Simon Pratt heard a right good Radio
from the neighbor's house, but on investigating found
it to be only a phonograph.
LISTERINE TO THIS

One good thing about the Radio is that you don't have
to worry whether the guy speaking to you has Halitosis
or not.
LISTERINE TO THAT

"Does Mr. Smith suffer much from his Halitosis?"
"No, but we do."
WE SUGGEST

That WTAS adopt a slogan. How about "Vice of a
Nation?"
SAID MR. LUDWIG

Radio man of the ZR3, "The Statue of Liberty looked
a great deal smaller to us than we had expected it
to be."

Well, it was larger until prohibition came to the
land of the free.
HEINRICH HASENFUSS

Has bought enough Radios to reach from here to
Kansas City, but he hasn't reached the coast yet.
SAID THE ANNOUNCER AT WSOE

"The next number is 'Kiss Me Again.' We will do
the best we can with the many requests coming in."
Now wasn't that nice of him?

THE THIRD TROMBONE PLAYER.

Pa's Radio

Pa is mesmerized and hypnotized,
While Ma looks on amazed;
He sits and works his superdyne
Until we're nearly crazed.
"Listen, we're getting out tonight,"
Says fan Pa with a grin,
"But shucks, it's only local—
So loud that's coming in."

Pa keeps us up at night so late,
Sometimes it's way past two;
"Sh!" says he, "I think I hear a song
Clear from Honolulu."
He keeps the whole darn house astir
With static from his set;
Ma has to set her foot down, too—
Or sleep we'd never get.

It's fine to have this wireless thing
A fillin' all the air;
But Pa he cares for nothin' else
But his 'ol tube set there.
We travel fast o'er all the land,
Amidst the squeaks and squawks;
There's one thing about that Radio,
We can't speak back when it talks.
RHEA SHELDON.

What Were You Drinking?

Dear Indi: While listening to KGO recently I heard
the following announcement:

"KGO—the voice of the prairies, broadcast from the
Aeolian hall by the Calumet Baking Powder company
at Winnipeg, down in Dixie, the city surrounded by the
United States, in the state where the tall corn grows,
in the land of ten thousand lakes. Announcer G. R.
the Hired Hand. KFI signing off at exactly 6:00 o'clock
Eastern Daylight time.
REH O. STAT AND SON, STATIC.

Absotively, Mr. Miloplex? Posilutely, Mr. King

Dear Indi: Hi! I know a guy who is waiter in the
Statler hotel at Buffalo, and it has been called to my
attention that he picks up China every day.

Do you suppose you could get this in on the last
line, seeing as how I have never made the line as yet?
KING MILOPLEX.

You're Always Welcome



Condensed

By DIELECTRIC

Out in Denver, where KOA sends forth three programs weekly, available dramas for Radiocasting evidently are none too plentiful. At least that would be the natural inference after hearing them put on "Mrs. Temple's Telegram," an interesting skit—some fifteen years ago. It may be that Radarios have not been supplied the studio. It "went over" anyway.

WTAM had a feature artist whose work almost made you doubt the assertion that Ruth Park is only twelve years old. Her playing of piano selections requiring maturity to interpret properly had moments of such treatment. In fact, I have heard pianists more than twice her age give less intelligent readings to a few of the compositions. Bravo Ruth and WTAM.

The Quaker City may not display the speed some of our eastern and western metropolises do, but the directors of studios in Philly's Radiocast stations are not behind the times nor are the local musicians lacking snap. WIP presented the city police band with soloists in a program full of pep and enjoyment.

A violin is one instrument capable of giving utmost pleasure or severe agony, according to the skill of the performer. Fortunately WHB had the good luck to know a musician falling within the first class. His choice of classical numbers was discriminating and rendition of them very delightful.

If you "Wait and hear Grebe" perhaps you will be pleased, perhaps not. The programs from this station are fairly diversified so that at some time during the evening's performance you may find what suits. The Lincoln's Specialty Boys succeeded in playing popular numbers in rather an agreeable manner. WAHG has a good corps of operators.

It was before KGO came on the air officially, and while they were testing under their experimental call, that we first heard the Arian Trio play. Since that time we have heard them often and never tire of the sheer beauty of their playing. Between acts of a KGO play, at the beginning or end of a program of any kind, this instrumental group always fits in gracefully. It is our hope that someday KGO will present an entire program of numbers by these musicians.

Of course they cry "We are ruined," those dramatists, fight promoters, dance hall managers, dog fanciers, et al., who think they saw millions upon millions of Americans listening to McCormack and Bori in their initial Radio appearance in preference to patronizing them. The day of substitution is over. If you want to see drama you won't accept music in place of it. Thank goodness the Victor company is allied with Radiocasting instead of futilely deriding it. Radio audiences are to have the best in music with a wonderful opening night in retrospect.

From the recording laboratory of the Brunswick company come voices of renowned artists. Mario Chamlee is one of America's foremost tenors; Florence Easton holds as high a place among sopranos, both of whom—with Elly Ney, English pianist—entertained through several Radiocast stations. Listening to WGY the concert came through splendidly, but the same cannot be said for WJZ in respect to the piano numbers.

There is not much fault to find with the playing of the Boston American orchestra as it comes to us through Station WNAC. The selections are good and their rendition shows capable leadership.

Demonstrating Radio Principles at Home

Chapter VII—The Experimenter Supreme

By J. E. Owen

RADIOPHANS inclined to experiment will find in this series of articles, directions for illustrating to their own satisfaction the underlying principles of Radio. They are told how to set up the experimental apparatus, which is simple and not so complicated as to require the equipment of a large laboratory, using odds and ends probably already at hand. Few new parts are needed. The last chapter, to appear next week, will be:
Chapter VIII—Experimenting with Push Pull Amplifiers.

PUSH-PULL amplification has been used in both audio and Radio frequency amplifiers with excellent success. However, since two stages of Radio frequency amplification are re-

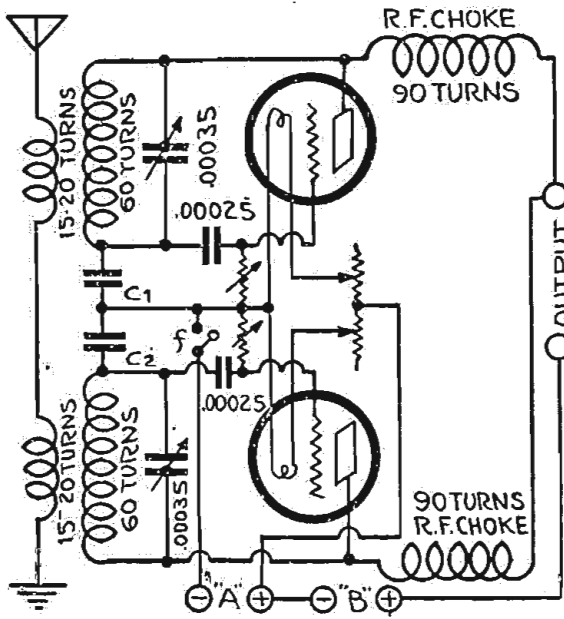


Figure 1

quired before any appreciable advantage is obtained over regeneration, this type of amplification has not been extensively adopted on account of tube and battery costs. Five tubes, obviously, are required in front of the audio frequency amplifiers.

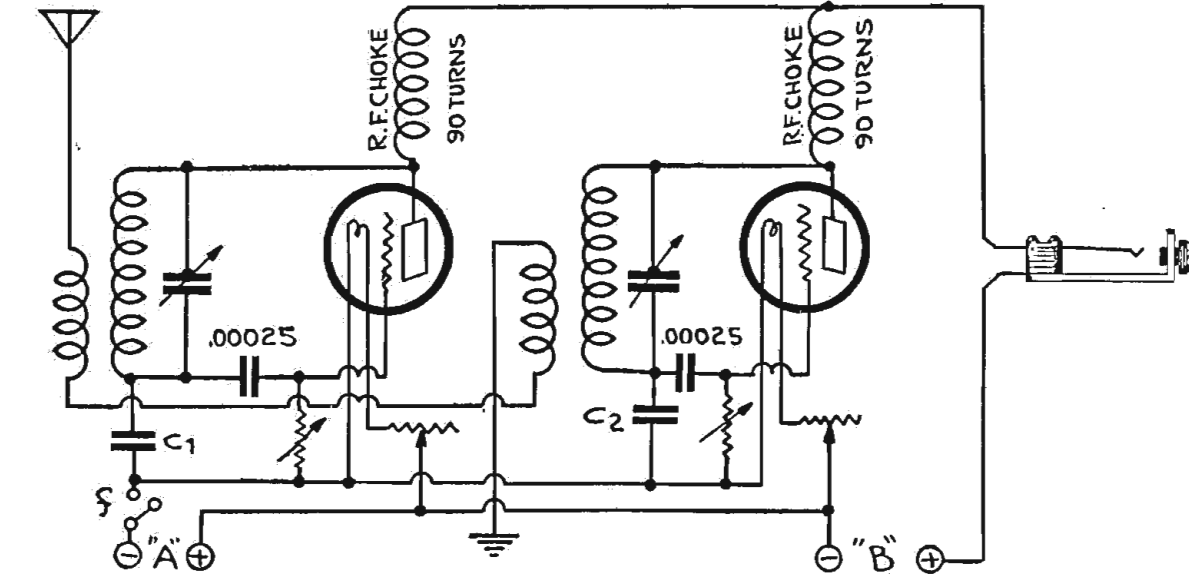


Figure 2

Only for the experimenter who has hours and dollars to spend is this form of receiver practicable.

The Experimenter Supreme is designed to retain most of the advantages of push-pull Radio frequency amplification and at the same time to reduce very materially the tube and battery costs heretofore involved. Regeneration is the form of Radio frequency amplification used and is approximately equivalent to two stages as ordinarily employed.

Push-Pull Radio Frequency

The circuit diagram of the Experimenter Supreme is given in figure 1. It will be noticed that while the input or Radio frequency circuits are arranged push-pull, the audio frequency or output circuits are in parallel. No audio frequency amplification is included in the diagram but if desired, it may be added in the usual way.

The circuit of figure 1 is general in that any types of apparatus (coils, condensers, etc.) may be used. However, in order that the experimenter may not go far astray, figure 2 is given in which the circuit is adapted to apparatus similar to that used in neutrodyne sets. The same form of air core Radio frequency trans-

formers are mounted on condensers of .00035 mfd. capacity. If the experimenter makes his own coils, it is recommended that the condensers be .0005 mfd. The panel and baseboard layout for this type of apparatus used in the circuit of figure 2 is shown in figure 3.

The construction of the Radio frequency choke coils is simple. On any tube about 2½ inches in diameter wind 90 turns of number 24 d.c.c. wire. Unless appearance is important, it is not necessary to take any pains in winding this coil. Tie the turns with thread in three or four places and slip them off the tube. Two such coils are to be wound. The coils should not be mounted close to each other or close to other coils in the set. The leads from the plates of the detector tubes to the Radio frequency chokes should be short. After the set is in operation these choke coils may be moved slightly in order to determine the position that gives the least reaction between them and the tuning coils.

Mounting Coils

The angle for mounting the tuning coils is, as in the neutrodyne circuit, 57.4 de-

LIST OF PARTS	
2 Air core Radio frequency transformers mounted on .00035 mfd. condensers	\$12.00
2 Smoothly variable rheostats	3.70
2 Variable grid leaks	3.70
1 Filament switch	.85
2 Fixed mica condensers, .00025 mfd.	.70
1 Jack, open circuit	.85
2 Dials, 3" with verniers	2.00
2 Sockets	2.00
2 Fixed mica condensers, .0001 mfd.	.70
2 Fixed mica condensers, .00025 mfd.	.70
2 Fixed mica condensers, .0005 mfd.	.70
1 Panel 7"x16"x3/16"	2.80
1 Cabinet to match	4.00
1 Baseboard 7"x15"x½ or ¾"	.80
1 Binding post panel 3"x7"	.75
6 Binding posts	1.00
Bus bar, spaghetti, etc.	1.00
Total cost	\$37.85
LIST OF ACCESSORIES	
2 Tubes, preferably "soft"	\$ 8.00
1 Storage battery	20.00
1 B battery, 22½ volts	2.00
1 Pair head receivers with plug.	6.00
100 Feet aerial wire	.80
4 Insulators	.60
40 Feet No 12 insulated wire	.60
Total	\$38.00

grees. This angle may have to be changed a degree or two for best results.

The correct values for the condensers C₁ and C₂ will depend on the types of tuning apparatus used and may be determined by experiment. On the average, this value will be either .0001, .00025, or .0005 mfd.

A list of do's and don'ts will not be amiss at this time.

The lead from the plate to the tuning (Continued on page 18)



Each Instrument of the Orchestra in Perfect Tune

IT MAKES all the difference in the world with the enjoyment you get out of radio whether the high notes of voice and orchestra are in tune or just a little "off."

A big point of the Bristol Audiophone is that each instrument, and each vocal note, comes in in proper pitch. You will love your Audiophone for its pure harmony of reception.

There are five Bristol Audiophones, priced from \$12.50 to \$25.00. If not at your dealer's, write for Bulletins AY-3011, 3017 and 3022.

The Bristol Company, Waterbury, Conn.



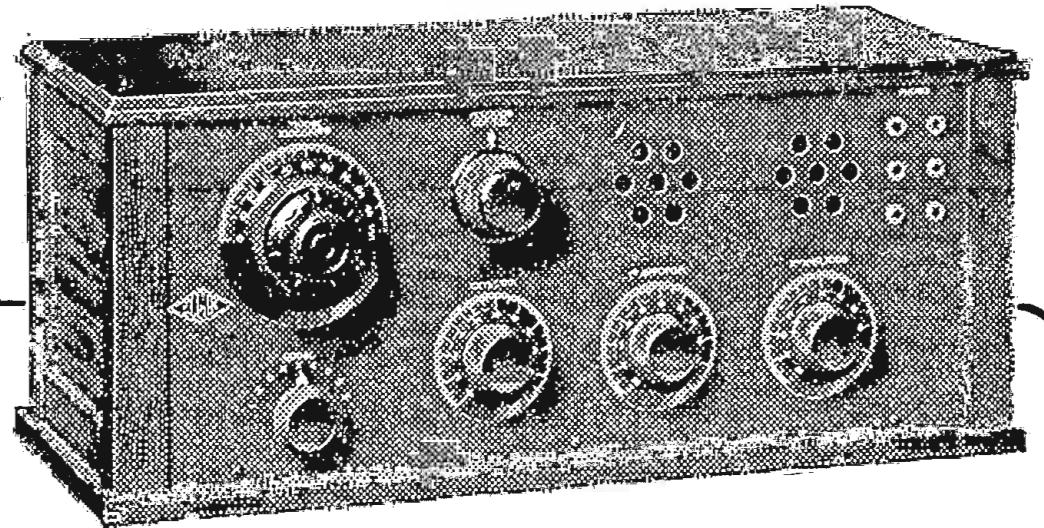
Cabinet Model \$30.00

Beautifully finished mahogany. Full floating wooden horn. Cast metal throat. Size 17x10x10¼".

Model S Audiophone \$25.00

Rubber horn, 14½" in diameter. Cast metal throat. Velvet mat finished, mottled bronze and gold.

BRISTOL AUDIOPHONE Loud Speaker



You Can Build This Set Without Soldering. Save Fifty-Dollars!

Don't pay the other fellow for doing what you can do yourself. Build your own Radio set—and have the fun of building it! The Elgin Super-Reinartz is supplied "knocked down." But it is different from the average so-called knocked down set.

Every thing is drilled, the panel is engraved—and there is absolutely nothing to solder. The parts assemble just like building blocks, all wires "clip" into place and the panel slides in the grooved cabinet and fits! Nothing to do but drive a few screws!

If you can use a screw driver you can build this highly efficient receiving set in an hour or so. Then call in your friends and show them the set you built yourself! Show them how easy it is to tune in the stations they have been unable to get with ordinary sets.

The Elgin Super-Reinartz is the set that has repeatedly tuned in 2LO, the hard-to-get London station. This same set has logged every worthwhile station in the United States, Canada, Mexico and Cuba.

The parts supplied you are exact duplicates of the parts we used in the original model, the hook-up is the same and an exact simplified working drawing is supplied. You can't go wrong!

We guarantee every part in the Elgin Super-Reinartz to be the utmost in efficiency. We guarantee the drawings furnished you to be duplicates of the same set that heard London. We guarantee reception that is only possible on other sets twice the size and price, providing our drawings are followed and the set is properly constructed as we direct! Read our FREE offer to you.

FREE!

We want you to learn more about this amazing set—mail the coupon with your name and address and we will send you the complete working drawings of the Elgin Super-Reinartz—absolutely FREE!

ELGIN Super-Reinartz "The Ford of Radio"



Elgin Radio Supply Company, Suite A, 207 E. Chicago St., ELGIN, ILL.

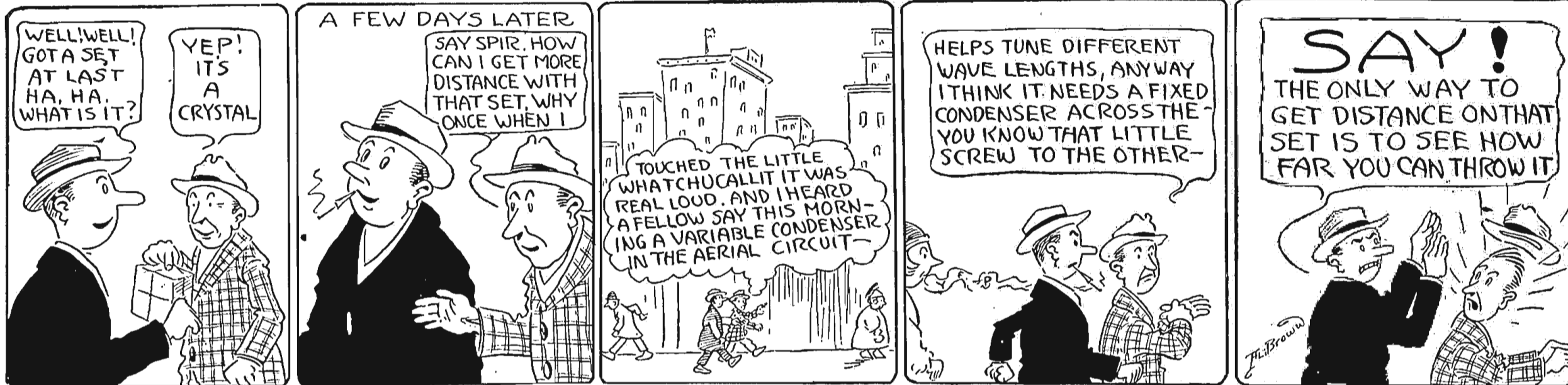
I want to know all about the set that heard London. Send the working drawings of the Elgin Super-Reinartz set by return mail—Free! I am enclosing a stamp to cover postage.

Name.....
Address.....

THE ANTENNA BROTHERS

Spir L. and Lew P.

Distance Without Howling



DEMONSTRATING RADIO

(Continued from page 17)

coil must be connected between the plate and the plate choke coil—not outside or beyond this choke.

BINDING POST PANEL

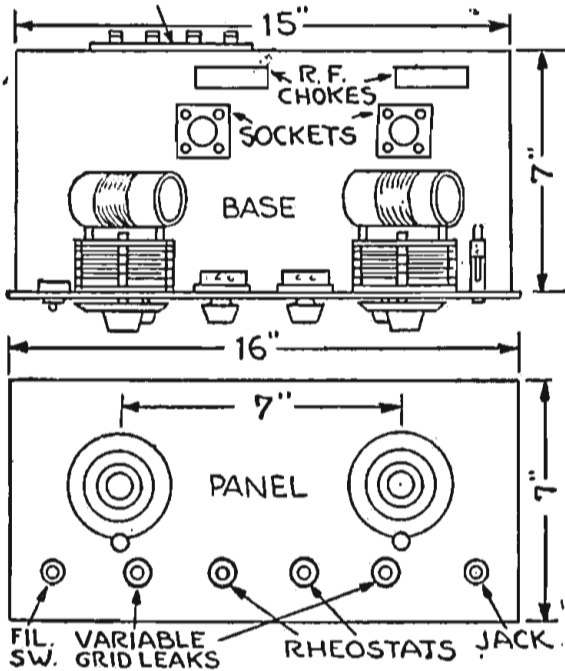


Figure 3

The primary coils in the two tuning circuits must be connected in a reverse

order, that is, so that a surge of electricity in the primary circuits will cause a surge in the secondaries in opposite directions with respect to the plate and grid of the tube in each circuit. Proper connections are shown in the illustrations.

Don't try to make this set using one rheostat to control both tubes. If the rheostats recommended in the list of parts are not used, the type selected should be good vernier rheostats.

Don't let either tube oscillate during reception.

Don't mount the variable condensers closer than six inches shaft to shaft.

Don't be discouraged if good results are not obtained at first.

(The theory of push-pull amplification with several examples using resistance coupling between the stages, with special reference to using dry cell tubes in series (filaments) being fed from a six-volt battery, will be the next and last article in the series.—Editor's Note.)

Non-Corrosive Flux

Celluloid dissolved in acetone makes a very good binder for Radio work. It should be used in place of shellac, colodion, etc. Rosin dissolved in rubbing alcohol, with a couple of drops of glycerin, makes an absolutely non-corrosive flux. A drop on a piece of wire suffices for most joints and makes a neat and noiseless job.

WOC AT DAVENPORT

(Continued from page 5)

installed to allow the pupils to listen in to any affair of national importance which is being broadcast. It is also used when B. J. talks to the students and they are unable to get into the auditorium.

Police reports are broadcast from this station whenever a man is wanted by the police. Recently two men escaped from the county jail by knocking one of the keepers unconscious. The warden called WOC on the phone and gave a description of the flying "birds" to the operator on watch. In a few minutes, the public were told to be on the lookout for the two men. This is one of the many services that WOC has rendered since their appearance on the air.

Even the elevator boy who runs the car up to the studio door is an ardent Radiophan. He has a small crystal set installed in the car with an aerial running around the top of the car. When WOC is broadcasting, he can listen in to the program without interrupting the elevator service. "Stan" claims that this is the ideal way to keep elevator operators from sleeping while on duty, excepting, of course, the bedtime stories have a bad effect.

Station WOC, using its old 1000-watt transmitter, has been heard in every state and province in the North American continent on one single program. On Decem-

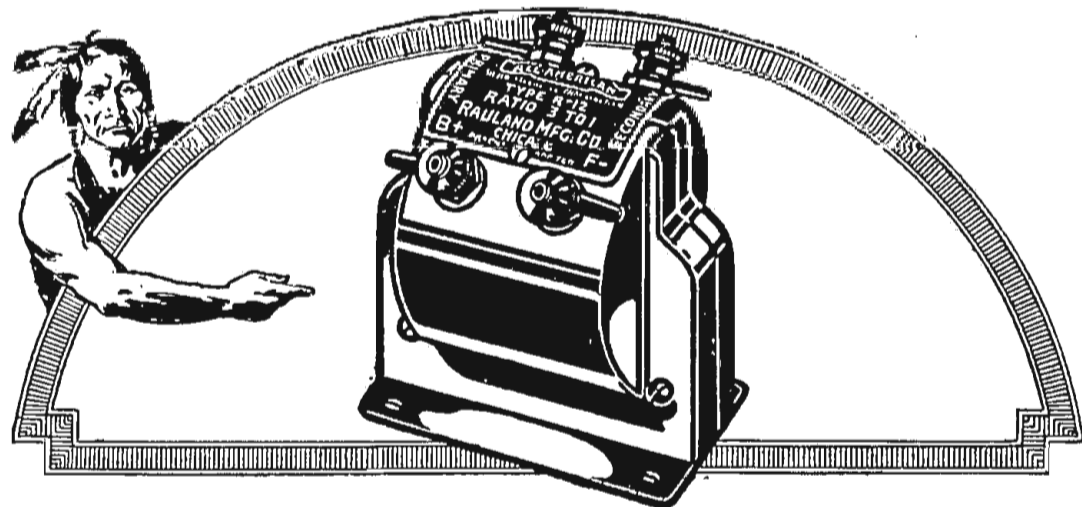
ber 16, 1922, a lecture by Major Dent Akinson was picked up thirty kilometers east of Paris, France, an airline distance estimated at 6,000 miles.

Since that time, reception of WOC signals have been officially reported at Stockholm, Rome, Great Britain, Buenos Aires, Samoa, the Philippines and by the MacMillan North Polar expedition in North Greenland. An enviable record was established in the early part of 1923 with the steamship Ardmore, in South American waters. While operating off the coast of Chili, in the vicinity of Antofagasia, which is more than twenty-two degrees south of the equator, the crew of the Ardmore were entertained regularly for three months with programs from WOC.

How to Stop Squeal

Distortion from an audio frequency amplifier caused by feedbacks between the transformers, can be cleared up by reversing the leads to the primary of one of the instruments. If a high pitched feeble whistle continues it can be stopped by connecting a .005 mfd. capacity fixed condenser across the output terminals of the amplifier.

If the audio frequency amplification units do not work well, try reversing the transformer leads. This applies, of course, to both the primary and secondary windings.



Reliable!

There is now an ALL-AMERICAN for every radio need. Audio and R. F.—Power Amplifying (Push-Pull)—Intermediate Frequency.

All-Amex Receivers—the famous ALL-AMERICAN Reflex—completely mounted with full wiring directions. Junior (1 tube) \$22. Senior (3 tubes) \$42.

ALL-AMERICAN Standard Audio Transformers in any radio receiver are recognized by experimenters and listeners everywhere as proof of assured efficiency in amplification.

Three Ratios:—3 to 1, \$4.50
5 to 1, \$4.75 10 to 1, \$4.75

Two pleasant hours spent with the RADIO KEY BOOK will acquaint you with the essential facts of modern reception, and how to enjoy it at its best. Ten cents—coin or stamps—brings the KEY BOOK.

RAULAND MANUFACTURING CO.
PIONEERS IN THE INDUSTRY
2640 Coyne Street Chicago

ALL-AMERICAN
Largest Selling Transformers in the World

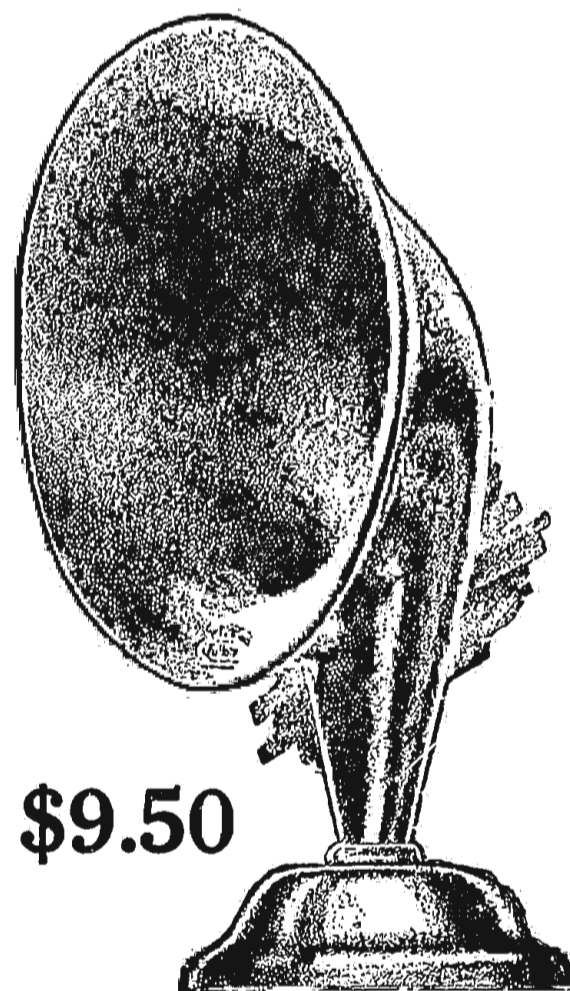
Fultone

Trade Mark

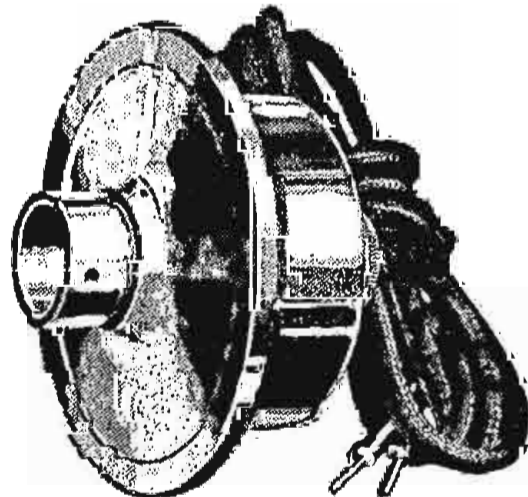
THE FORD of LOUD SPEAKERS
\$9.50

Fultone Loud Speaker has conclusively proven to the radio world that a reproducer could be made and sold at \$9.50 which would handle music or speech in volume as perfectly as any speaker at any price. The horn is solid, non-ringing and wide-throated enough to handle the powerful reproduction from super-heterodyne or reflex. The adjustable diaphragm permits matching Fultone to any receiver and "B" battery voltage.

Either speaker or unit will be shipped on a satisfaction or money back basis on receipt of price in money order or currency. The coupon is provided for your convenience in ordering if your dealer cannot supply you.



\$9.50



Fultone

Trade Mark

LOUD SPEAKER UNIT
\$6.00

Its large diaphragm and bobbins of heavy nickel-plated case through the means of a special key. The pole pieces are not made from a solid piece of iron but are assembled from 15 laminations of carefully chosen steel.

Use on Your Phonograph
Edison Adapter.....25c
Columbia or Pathe.....20c
Brunswick30c

HALL & WELLS, Inc.
128 N. Wells St. Chicago, Ill.

This unit is the secret behind the unparalleled success of Fultone Speaker. fine wire are protected from injury by a back of which adjustment is made by

Tear Off, Fill in, Mail Now

HALL & WELLS, Inc., 128 N. Wells Street, CHICAGO, ILL.

Enclosed is \$.....for which ship me () Fultone Speaker.....() Fultone Unit at once, my money to be refunded if I am not satisfied and return this merchandise within 5 days.

NAME.....

ADDRESS.....

CITY AND STATE.....

Construction of the Six Tube Hetduogen

Part V—Assembly of the Front Panel

By C. E. Brush

WITH the sub base apparatus in place and wired, we can now take up the drilling and assembly of the front panel. The layout of the apparatus on the sub base was such that we can place the front panel parts symmetrically without resorting to long leases. On the panel we must secure three condensers, two rheostats, a battery switch and two jacks. The 20-ohm rheostat is the left, the 6-ohm rheostat to the right.

The Full Size Layout

Figure 12 is the layout for this panel. Due to the fact that there has been no standardization of mounting holes for Radio apparatus, an enlargement of figure 12 cannot be used as a drilling template for all the holes. Lay out figure 12 on a large sheet of paper; now, in each box containing rheostats and condensers will be found a template for the drilling of mounting holes. Paste these small templates on the large sheet so that shaft holes coincide. On the boxes containing jacks and the switch will be found directions for the size hole to be drilled for those items.

The writer has, for some time, followed the practice of mounting condensers with the stationary plates up and the rotor plates swinging below, as in figure 10 of last week's description. This prevents damage to the rotor plates from above after the set is in the cabinet and one is making adjustments. In placing the condenser templates in position rotate them so that, when the condensers are mounted, the plates will be as stated.

Panel Mounting Holes

Note the width of the rabbeting around the front of the cabinet; it will probably be 5/16 inch, 3/8 inch or 1/2 inch. Whichever it is, measure from the panel edge lines one-half that distance and mark to drill small countersunk holes for flat head wood screws to hold the panel to the cabinet. If the rabbeting extends across the bottom, mark to drill four equally spaced holes across the bottom edge of the panel for screws. On each end two holes are to be drilled, one about 1 1/2 inches from the top and one 1 1/2 inches from the bottom. If

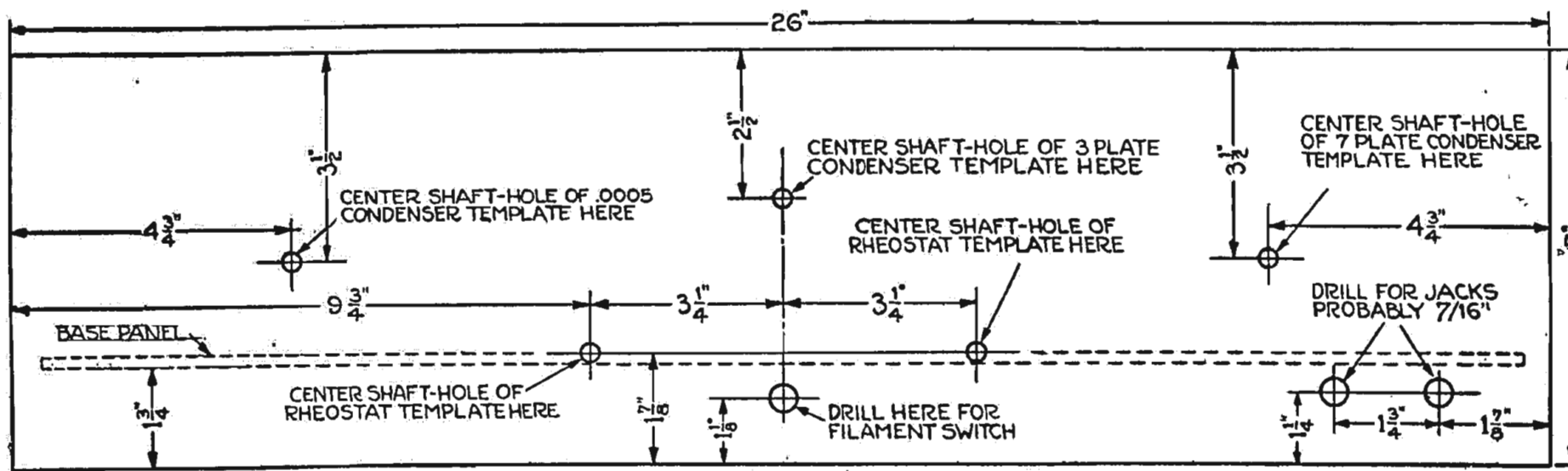


Figure 12

your cabinet is of the type that has rabbeting across the top, mark to put in four holes across the top edge of the panel for screws, corresponding in position to those across the bottom.

Check over the large sheet for all drill marks: condensers, rheostats, jacks, switch, mounting screws and angle brackets. In connection with the angle bracket holes, they should be so placed that, when the sub base is mounted, there will be 1 3/4 inches below it to the bottom edge of the front panel. The jack centers are 1 1/4 inches from the bottom edge and, if these dimensions are followed exactly throughout, no difficulty will be experienced from parts not fitting together exactly.

Now clamp, or paste, this large layout drilling sheet to the front panel and center punch all holes before drilling. It will be found a wise precaution to drill any 5/16-inch and 7/16-inch holes with a number 27 or number 18 drill before using the full size. This for the reason that large drills do not have sharp points and are only too apt to start considerably off the mark.

When the front panel apparatus has all been mounted in place the wired sub base can be attached to it by the brackets. While figure 7 shows but two right angle

brackets and figure 10 shows two 45 degree brackets also, this should not prove confusing. If your right angle brackets are sufficiently heavy, the others are unnecessary, but there is plenty of room for the 45 degree brackets if the others are rather light.

Connecting Sub Base to Panel

The rotor of the .0005 mfd. (500 mmfd.) condenser can now be connected to inductance L-3, as shown in figure 10, the stator connected to the stator of the 3-plate condenser and to inductance L2, the rotor of the 3-plate to the P post of the mixer tube, the rotor of the 7-plate condenser to inductance L5 and P of the oscillator tube socket, and finally the stator plates to G of the oscillator socket. Rheostat and jack connections are clearly shown in figure 11 of last week.

It will be noted in that diagram that the short spring in the double circuit jack is connected to the plus B supply, and the frame of the single circuit jack is connected to this same lead. Such a connection, while it would cause the current to

flow correctly through the speaker in one jack, would cause it to oppose the magnetism when the other jack was in use. The double circuit jack should be turned so that the long spring is closer to the second jack and is connected to the plus B lead.

The set is now complete and, as wired, will probably work fairly well. There are, however, numerous little adjustments and changes to be made before any receiver of extreme sensitivity and volume such as this can be expected to work at 100 per cent efficiency.

(In next week's issue, Mr. Brush goes into the changes that may prove desirable in the 7-plate condenser and the use of the second variable resistance.—Editor's Note.)

GAVE ARCTIC EXPLORERS THEIR NEWS

New York City—Donald H. Mix, wireless operator of the McMillan Expedition, reports Thordarson Transformers used in their radio stood the extreme temperature of the Arctic without the slightest mishap. They were in as good condition on their return as when installed in May, 1923. Thordarson's are standard on the majority of leading sets. Partial list below:

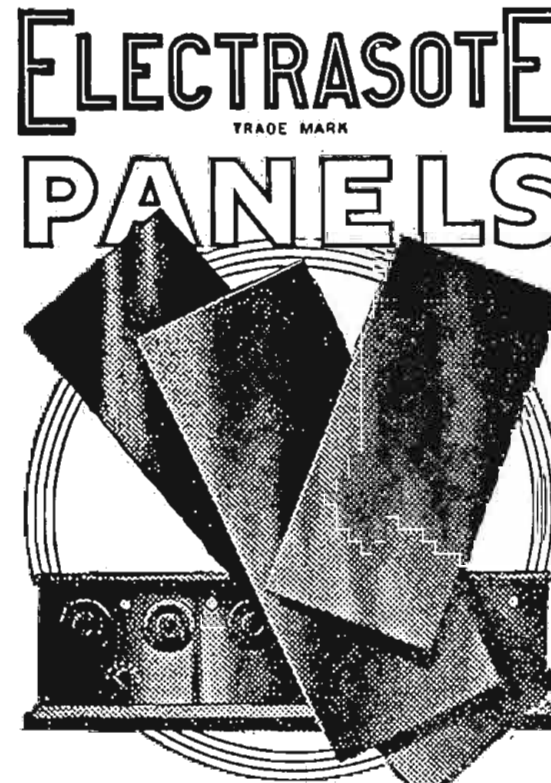
KENNEDY
Radiodyne
Pathé
ULTRADYNE
MURDOCK
MICHIGAN
Howard
QZARKA
THERMODYNE
Pfanstiehl Super - Het Builders!
PHENIX
MALONE LEMON
AUDIOLA
GLOBE
HARMONY
ODELL FERRY
PEERLESS
MASTER RADIO
MUSIO
SAAL AND MANY OTHERS

The finest sets have
THORDARSON
Super TRANSFORMERS

Follow the lead of the leaders—build or replace with Thordarson's. Unconditionally guaranteed. Recommended by best dealers. Audio frequency 2-1, \$5; 3 1/2-1, \$4; 6-1, \$4.50. Power Amplifying, pair, \$13. Interstate Power Amplifying Transformer, \$8. Write for latest bulletin. THORDARSON ELECTRIC MFG. CO. CHICAGO.

More Than Just the "Front" of Your Set

A Radio panel should be more than just the "front" of your receiving set. It is an important feature that should be selected just as carefully as any other part.



meet the most exact specifications. They reduce surface leakage to a minimum. Unaffected by climatic conditions, they will neither warp nor change color, retaining for all time their fine finish. When you buy an Electrasote Panel you are getting something with a reputation back of it, for Electrasote is one of the celebrated "sote" products introduced by The Pantasote Company, Inc. Yet these panels are

Lower Priced than other standard panels
 Make your Set an "Electrasote Panel Set"—and get results!
 On sale at good Radio Dealers
M. M. FLERON & SON, Inc.
 Sole Sales Agents
 Trenton - New Jersey

Hansen "BIRD-CAGE" Radios

NIGHTINGALE RADIO

4-Tube Receiver
NIGHTINGALE\$32.50
 A wonderful little set.

4-Tube Cabinet Receiver.
BLUEBIRD\$57.50
 Easy to tune—long distance—selective.

4-Tube Receiver.
WARBLER\$90.00
 A very high grade receiver — very selective.

AMERICAN CREST.....\$150.00
 This we believe to be the best 6-Tube loop set on the market.

We Announce the 5 TUBE RECEIVER
GOLDFINCH\$75.00

Bronze panel and Gold dials—Beautiful Mahogany Cabinet with space for B Batteries. This set looks and performs like a Million Dollars. We cannot offer anything better.

For further descriptions Write for New Catalogue
 Dealers and Jobbers—Our line is interesting and profitable.

RADIO DEPARTMENT HANSEN STORAGE CO.
 "THE MILLION DOLLAR WAREHOUSE CO."
 120-134 JEFFERSON ST., MILWAUKEE

The "Goode" Two-o-One

A
 Le Ton d'argent

Guaranteed

BY MAIL ONLY
\$2.39
 Postpaid

QUARTER AMPERE AMPLIFIER-DETECTOR RADIO TUBE

GUARANTEED SATISFACTORY

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

ONE—"Goode" Detector-Amplifier..... \$2.39
THREE—"Goode" Detector-Amplifiers..... 6.42
 (All postage prepaid)

The "Goode" Two-o-One A Tube amplifies or detects. It is a quarter ampere, five volts, standard base silvered tube.
 Send express or postal money order or New York draft to—

The Goode Tube Corporation
 Owensboro (Dept. A) Kentucky

HOW TO OPERATE SET

(Continued from page 15)

1, turn the "volume control" knob U away from "100" toward "soft"; 2, pull out the jack switch S; 3, shift the set on the table, until best position is found.

Eliminating Interference

Signals from an interfering Radio station may be eliminated or at least minimized by either of the following methods:

1. Turn "station selector II" pointer V, either to the right or left, by approximately 1/4 to 1 inch, to find another position of this control, where the desired station will be again heard. The setting of "station selector II" nearer the left end of the scale is technically called the "lower wave length peak," and the other the "upper wave length peak." Two settings of this nature will be found for all broadcast stations, and the separation between them becomes greater and greater for the higher end of the scale, i.e., nearer the right hand end. It is recommended that "station selector II" be consistently set on the "lower peak" in the usual manipulation of the set. When interference is encountered, shift to the "upper peak," and use whichever one at which minimum interference occurs.

2. Rotate the receiver on the table. For every transmitting station, there are two positions at which the signal strength will rise to a maximum, and two others at right angles at which it is at a minimum. Place Radiola super where best results are secured, trying to locate the position where the interference does not come in, but the desired signals do.

Four paper dials for each of the "station selectors" will be found with the set, three each in the envelope for the instruction book, and one each in place on the panel. To put another "station selector I" dial in place, grasp pointer N with the left hand, turn and remove the knurled nut which holds it in place. Grasp the two knobs on the end of the clamp wire, pinch the knobs together, and pull the clamp wire free from its retaining ring. Remove the old dial and place a "station selector I" dial on the panel, taking care properly to line up the central hole and the notch on the left hand side. Replace clamp wire, pointer N, and knurled nut in the order mentioned. Follow the same process for "station selector II."

The paper dials provide a means of recording the settings of the "selectors" for the various stations. Once recorded, the pointers may be reset at any later time to these positions, and if the station is broadcasting, it will be heard. After a station is tuned in as above, mark the

positions of one of the tips of each of the "station selectors" as well as the call letters of the station. It is suggested that only the "lower peak" of "station selector II" be recorded.

General Information

Each of the "station selectors" is provided with four pointers, in order that stations of nearly the same setting may be recorded on the dials without crowding the markings. It is suggested that the gold-tipped pointers be reserved for wave length or frequency markings, and that the station settings be recorded on the three remaining pointers in the following order: Long black pointer, right short pointer, and left short pointer. Mark as many stations as possible on the long black pointer. When a new station is tuned in, quite close to one already recorded, then use the short pointers for the markings.

The only precaution to be observed when making these markings is to see that the set is not located near any large metal objects, such as a steam radiator, or that it is not near any aeriols or electric wiring. Such positions may cause changes in the settings of "station selector I."

The "battery setting" knob K should be kept as near the "off" position as possible, without decreasing the signal strength or destroying the quality of reception. The six tubes should be used at all times. It is inadvisable to remove the sixth tube when only five are used, to reduce volume. Rather reduce volume by dimming all filaments or by turning the set than to employ this method. Both these precautions make for economical use of the batteries and tubes.

Very little maintenance is required on this super-heterodyne, outside of an occasional oiling of a few of the parts. The oiling operation is important, and should be done about once every six months. To oil the moving parts, turn both "station selector" pointers as far right as possible, and open the panel of the set half way. Then place one drop of good grade oil, such as typewriter oil, on each of the following parts of both "station selectors":

- 1, on the front and rear bearings of the shafts, where the shafts pass through the black moulded sub-panels;
- 2, on the bushings in the panel which hold the "selector" knobs;
- 3, on the universal or ball joint just back of the "selector" knob shaft;
- 4, on the spring bearing of the slanting

knob shaft (which spring bearing presses against the black insulation collar).

Possible Difficulties

Should any trouble develop in the use of Radiola super-heterodyne, it will in all probability be due to loss of life of the tubes or to the exhaustion of the batteries. As the batteries grow old, they decrease in voltage, and increase in resistance. After the tubes have been used for a long time, their filaments tend to lose emission. If the difficulty appears to be elsewhere, it is recommended that the services of the dealer from whom the set was purchased, be enlisted.

If the set becomes inoperative, try interchanging the tubes. The second tube from the right is the important one and it is well to replace it before looking elsewhere for tube trouble. Try substituting this tube for either the third, fourth or fifth one. It is of advantage to keep a spare UV-199 on hand, to meet emergencies.

There are several indications by which the user may determine that the filament or A batteries are becoming exhausted. These are low filament brilliancy, weak signals, and distortion, the signals becoming less and less recognizable. When it is found necessary to turn the "battery setting" knob up to "100," and the operation of the set is still unsatisfactory, it is a definite indication that the filament batteries are exhausted.

When fresh batteries are installed for the first time, listen to the loud speaker, while pushing the jack switch in and out. Sharp "clicks" will be heard in the loud speaker. Do this sufficiently to learn just how loud the click should be. If the B batteries have become fairly well exhausted, these clicks will become practically imperceptible—an indication that they need replenishing.

An indication of exhausted C batteries may be had by listening to the loud speaker with no station tuned in. If the loud speaker gives forth a continuous noise, the battery needs renewal. The noise may be either a high pitched whistle, a high cackling sound or a low gurgling murmur. Frequently the whistle is so high as to be above the range of audibility for some, but in any case the noise becomes more audible as the batteries age.

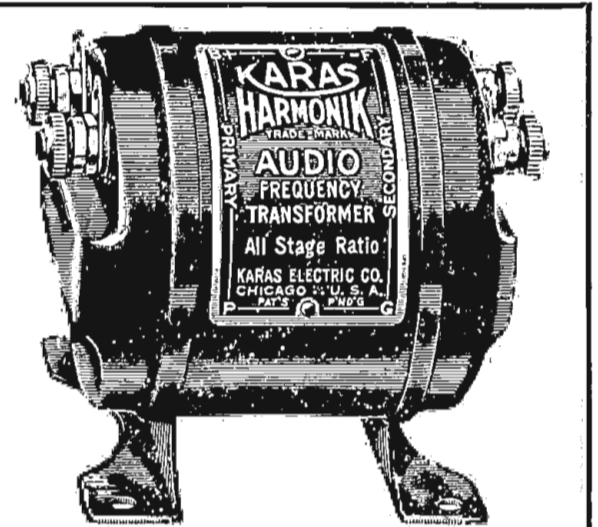
When a storage battery fails to take a charge, it is an indication that it needs to be overhauled at a battery service station.

C Battery Effects Saving

The C battery as a grid bias effects a saving in B battery current consumption. The C battery is used in the audio frequency stages. Although the C battery reduces the amount of current in the plate circuits of the tubes, it does not cause a reduction in the strength of signals when properly used, but rather a slight increase with added signal clarity.

Static Cut with Short Aerial

A short antenna cuts down the static. The signal may also be somewhat weaker, but it does not fall off as much as the static and the result over-all will be more pleasing reception.



The Scientifically Designed New Karas Harmonik Audio Frequency Amplifying Transformer.

"The Best Transformer Money Can Buy"

THE only transformer that amplifies all frequencies equally—only transformer that can handle 2 audio stages of an efficient super-het without howling. Delivers full, round, rich, mellow tones—every tone separate and distinct—all the vital harmonics and rich overtones amplified equally with fundamental frequencies. Result—pleasing, natural, enjoyable music from loud speaker. Sold everywhere on an unconditional guarantee. Used, recommended and specified by leading radio engineers for their advanced sets designed to deliver music instead of noise.

Karas Electric Company
4040 N. Rockwell St. Chicago, Ill.



Four Point Tapped Loop \$8.00
Center-tapped Loop \$6.50



If your dealer cannot supply you, order direct giving your dealer's name.

Electrically and Mechanically the finest loop ever designed

RADIO engineers designed Lincoln Collapsible Loop Aerials. That is the reason for their remarkable efficiency. They are electrically and mechanically correct. They combine with greater selectivity—volume—and clearness of reception—a graceful beauty which is the result of painstaking manufacturing.

The center-tapped loop can be used on any sets employing radio frequency amplification—particularly fine for use with certain super-heterodynes requiring a center-tap. The 4-point tapped-loop—for any circuit where it is desired to vary the inductance of the loop—most super-heterodynes—neutrodyne receivers where outside aerial is impractical.

A better loop—for less money

Lincoln Loops cost less—and do more. Volume production—engineering efficiency—are the reasons. Fully guaranteed—sold by leading dealers.

Write for catalog

Send your name and dealer's name for copy of the Lincoln Catalog fully describing Lincoln Radio products.

To Jobbers and Dealers

Lincoln Radio Products are sold only through the legitimate trade. Dealers please write us for the name of the nearest Lincoln jobbers. We will be glad to send our sales proposition to jobbers.



Lincoln Radio Corporation
224 North Wells St. CHICAGO

The Radio Book



How to understand radio assemble circuits operate sets & improve reception

THIS book, prepared by the technical staff of Radio Digest, is for the millions of listeners who want to know the what, whys and hows of their receivers—what is inside, why it is there, and how to operate it for best results.

The New Radio Book is given free with a year's subscription to Radio Digest. This wealth of information, carefully classified, can be yours within a few days if you will use the coupon.

RADIO DIGEST
510 N. Dearborn St., Chicago, Ill.

Enclosed find five dollars for one year's subscription to Radio Digest including FREE the New 124 Page Radio Book called "Radio Receivers—How to Operate and How to Make."

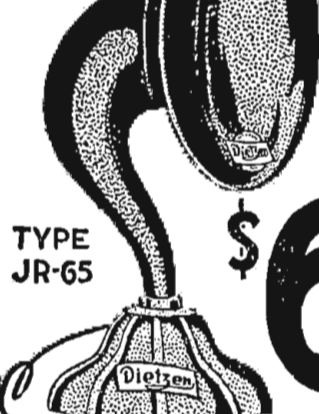
NAME.....
ADDRESS.....
CITY..... STATE.....

DIETZEN Adjustable LOUD SPEAKER

At the Price of an Ordinary Pair of Head Phones

DEALERS: write for details

SEND NO MONEY!



TYPE JR-65

\$6

PLUS A FEW CENTS POSTAGE

ORDER BY MAIL
If your dealer cannot supply you we will ship you a complete DIETZEN JR-65 speaker ready for use. Written money back guarantee with each loud speaker.

COMPLETE with specially built DIETZEN adjustable loud speaker unit and plug.

NOT a Head Set Unit

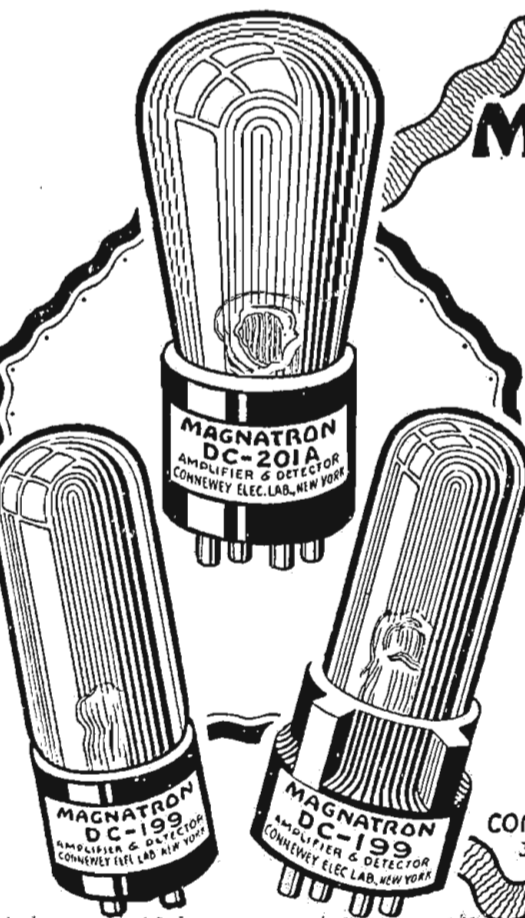
DIETZEN INC.
71 Cortlandt St. New York
Dept. D.

MAKERS OF PRECISION INSTRUMENTS SINCE 1889

SPECIAL FEATURES

- Absolute non-metallic sound. Permanent Crystallized finish.
- No batteries necessary. Specially constructed adjustable unit with gold plated diaphragm.
- Unconditionally guaranteed for one year from date of purchase against mechanical defects of any kind.

SPECIFICATIONS:
Diameter of Horn - 9 INCHES
Height 17 INCHES



MAGNATRON

A GOOD set deserves Magnatrons. If you want clearer reproduction and greater volume, then use Magnatrons exclusively.

MAGNATRONS know no superior today. They have been improved to the point where their continued leadership is assured.

Your dealer will be glad to show you the MAGNATRON DC-199, the MAGNATRON DC-201A, and the MAGNATRON DC-199 (large base).

Each of these types \$4 lists at only.....

CONNEWEY ELECTRIC LABORATORIES
309 Fifth Avenue NEW YORK CITY

Antenna Coupling for Superdyne Set

Volume Obtained with Selectivity on Distance

While experimenting with various kinds of antenna coupling for my superdyne set, I hit upon an arrangement whereby the volume on both local and distant sta-

WORKSHOP KINKS EARN A DOLLAR—

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

RADIO KINKS DEPARTMENT
Radio Digest,
510 North Dearborn St., Chicago

tions is increased quite a bit. This discovery was purely accidental.

Leaving one side of the four primary turns connected to the aerial, I was connecting the ground lead to various points. I touched it to the grid lead of the Radio frequency stage and noted that the stations came in with surprising volume. I also noted that the selectivity of the set was increased and that the wave length was increased by about 25 meters.

As is shown in the diagram, one side of the primary coil is left open. To change from the old circuit to the new at will, I installed a single pole double throw switch. A convenient arrangement is to use a switch arm and two contact points.

Another arrangement worth trying is shown in the second illustration. The single pole double throw switch can also be used on this hook-up.

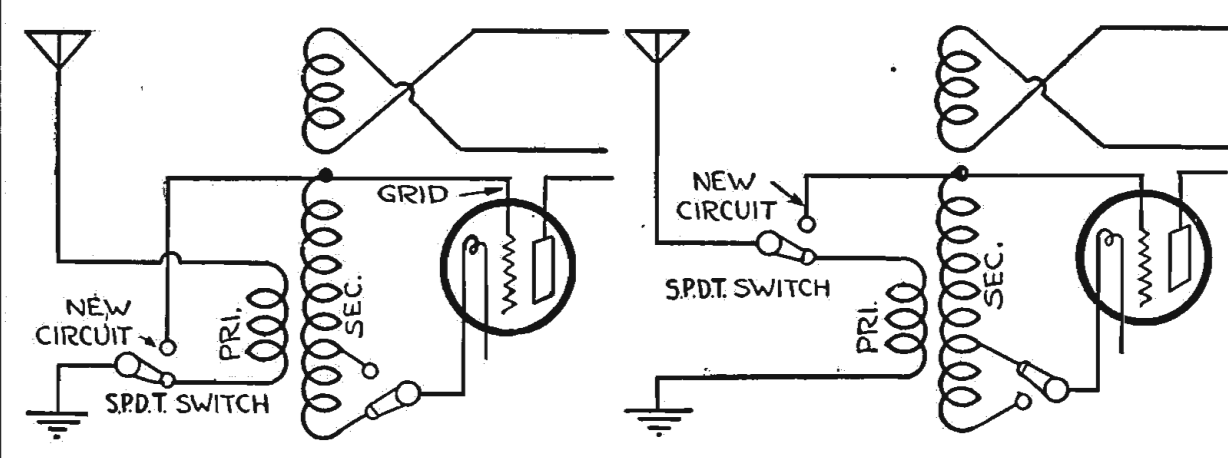
Using these arrangements, I have been able to hear WGR, WGY and KDKA very well.—Henry G. Jones, Jr., San Diego, Calif.

Single Circuit Receiver

While the accompanying diagram is very much self-explanatory, a few suggestions may aid any who desire to build such a set to get the most out of the circuit. Success depends very much on the use of the best materials. Not necessarily the most expensive, but the most efficient. The winding of the variocoupler turns noted be exactly as given, but the turns mentioned have produced the best results with selectivity.

The capacity of the grid condenser and leak is very important and the adjust-

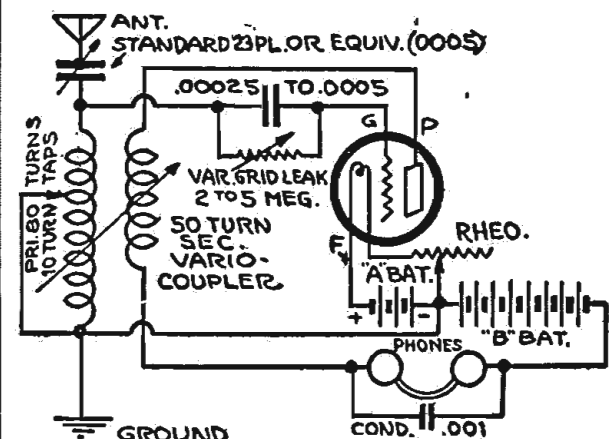
WAY TO INCREASE SELECTIVITY



ment of the grid leak is very critical, but once found it may remain the same for any tube used.

If the tone of the set is too metallic, increase the capacity of the phone condensers. The capacity of .001, as shown, should be about correct, but larger capacity may give a more mellow tone to music.

When the correct filament and plate voltage are found they do not vary. When the rheostat is adjusted properly all



tuning is done with an aerial condenser and the variocoupler. The aerial condenser controls the wave length and the rotor of the variocoupler controls regeneration. A good ground is very essential.

One of the secrets of selectivity in the use of an aerial about 50 feet high and from 70 to 80 feet long, well insulated.

Long distance reception will come quickly with this set, as its simplicity permits the operator to become familiar with the tuning controls. Learn to tune with both hands. Mount the condenser and variocoupler so the right hand adjusts the wave length with the condenser, and the left hand adjusts the regeneration with the coupler. In this way it will be found that presently the left hand will work automatically without thought, keeping the tube just at the point of oscillation while tuning. This gives quick and satisfactory operation with a minimum of interference to other nearby receiving stations. Good phones are es-

sential for long distance reception.—Cliff H. Dafoe, Guelph, Ontario, Canada.

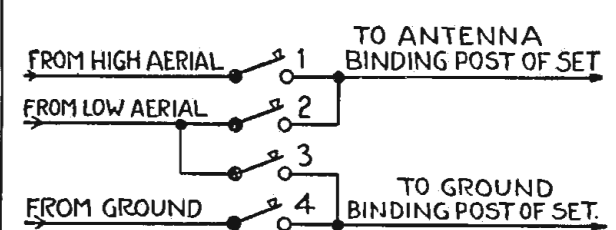
Locating Condenser Shorts

A short circuit in a condenser is usually quite easily located by the scraping of the rotary plates against the stationary ones. This is not always so, though, because sometimes the contact is so light that it makes no noise at all. This is the worst kind of "short" and the hardest to locate. Placing a white piece of paper under the condenser with a strong light on it will sometimes allow the fan to locate the touching plates, if he looks through the condenser sidewise. It is usually cheaper to buy a new condenser than to attempt to fix one which has become damaged in this way.

When building a receiving set, it is best to first obtain the necessary parts and from the dimensions of these units lay out the panel and baseboard.

Switch Combination for Antenna and Ground

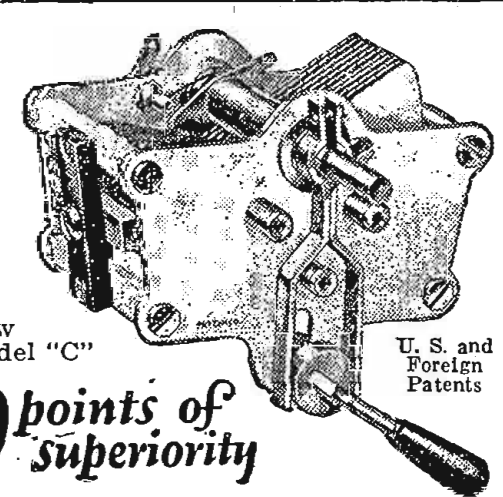
When I built an underground antenna according to the instructions given in Radio Digest I found it convenient to have a system of switches to connect the upper aerial, underground aerial and ground in whatever combinations I desired for best reception. In this combination I used four small 15-ampere single pole single throw knife switches.



As the illustration shows this system gives five combinations. Closing all switches grounds the whole system.

If the underground aerial is placed directly below the regular aerial it can be used for a counterpoise.—N. V. Parsons, Pasadena, Cal.

Number 12 enameled solid copper wire is excellent for aeriels. Aluminum wire is not recommended.



New Model "C"

U. S. and Foreign Patents

9 points of superiority

1. Soldered brass plates, chemically treated against corrosion.
2. Special shaped stator plates for easy tuning of low waves.
3. Adjustable ball-bearing rotor, grounded through metal end-plates.
4. Clock spring pig-tail.
5. Minimum dielectric losses too small to be measured.
6. Rugged, compact construction; cannot warp.
7. Micrometer vernier; no backlash.
8. Takes any size dial.
9. The product of 14 years' experience, making precision instruments.

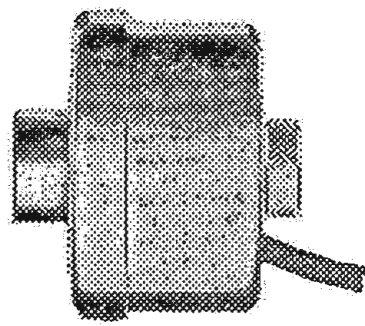
HAMMARLUND MFG. CO.
424-438 W. 33rd Street, New York

CHICAGO DISTRIBUTORS: Hudson-Ross, Manhattan Electric Supply Co., Wakem & McLaughlin

For Better Radio Hammarlund PRECISION CONDENSER

Morrison Loud Speaker Unit

\$5.00 (Was \$10.00)



Standard of Radio

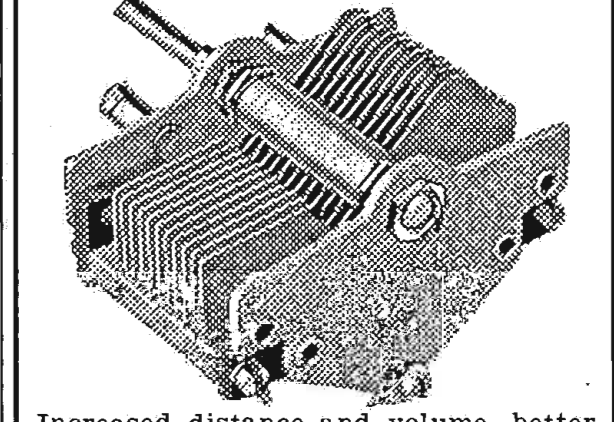
For three years—long before the days of Super-Heterodynes and many other splendid radio successes—Morrison has been the acknowledged leader among loud speaker units. Today the most powerful sets, and the most sensitive, reproduce at their best through Morrison Loud Speaker Units. There is no problem when buying a unit for either phonograph or horn—buy a Morrison and be sure.

You can adjust it loud for distance and tone it down for local reception in a second's time.

On sale at all good radio and phonograph dealers. Mail orders shipped promptly from factory. Interesting Loud Speaker Facts free on request.

Morrison Laboratories Inc., 343 E. Jefferson Ave. Detroit, Mich.

DXL MARK Straight-Line Low-Loss Condenser



Increased distance and volume, better still, much greater Selectivity are certain results with D. X. L. Straight-Line Low-Loss Variable Condensers. No D. X. L. Condenser leaves the factory that doesn't meet the quality tests outlined by D. X. L. engineers. Set builders can use D. X. L. Condensers right out of the carton with the certainty that each one is perfect. Use D. X. L. Condensers and you are sure of the best performance.

New D. X. L. Kit

Now ready—the D. X. L. 5-tube tuned R. F. Receiver Kit absolutely Straight Line and Low Loss. Will separate two stations only 3 meters apart, broadcasting simultaneously. No squeals, non-oscillating. Coast to coast reception on loud speaker. Less static interference. Positive results guaranteed if built in accordance with detailed instructions and blue print, free with every D. X. L. Kit.

Get our booklet—full of interesting and valuable information—FREE

D. X. L. Radio Corporation 5771 Stanton Ave. Detroit, Mich.

The Crystalstat



PRICE \$2.50

The Ideal Reflex Detector but equally suitable for crystal sets. The Crystalstat embodies the following features: A super-sensitive crystal in an air tight enclosure. A brush cut whisker of gold tinsel strands. A micrometer adjustment by means of which the most delicate adjustment may be had. The multiple contacts of fine gold filaments prevent howling and gives light but sure contact. The crystal is our wonderful Star-ite, the pick of the Earth's best crystal. The Crystalstat attaches through one 5/16" hole in the panel so that only the control knob shows on the face of the panel. Packed in one dozen lots for dealers. Ask your dealer to supply you or you may send for one C. O. D. with your money back if not completely satisfied. DEALERS and JOBBERS please get our catalog of crystals and detectors and our liberal distributing proposition.

Star Crystal Co. 1414 525 Woodward Avenue DETROIT - MICHIGAN

The Air Line Radio Map and Log



This Map is Up-to-Date When You Get It and Is Kept That Way monthly supplemental service, for the whole season. Order NOW for Real Radio Enjoyment. Printed in three colors. Price 50c. Size 12 x 18.

Seventh Edition Just Off the Press At Your Dealers or Sent Prepaid Dealers and Jobbers Write M. M. CO. 3600 St. John, KANSAS CITY, MO.

BLUEBIRD Radio Tubes

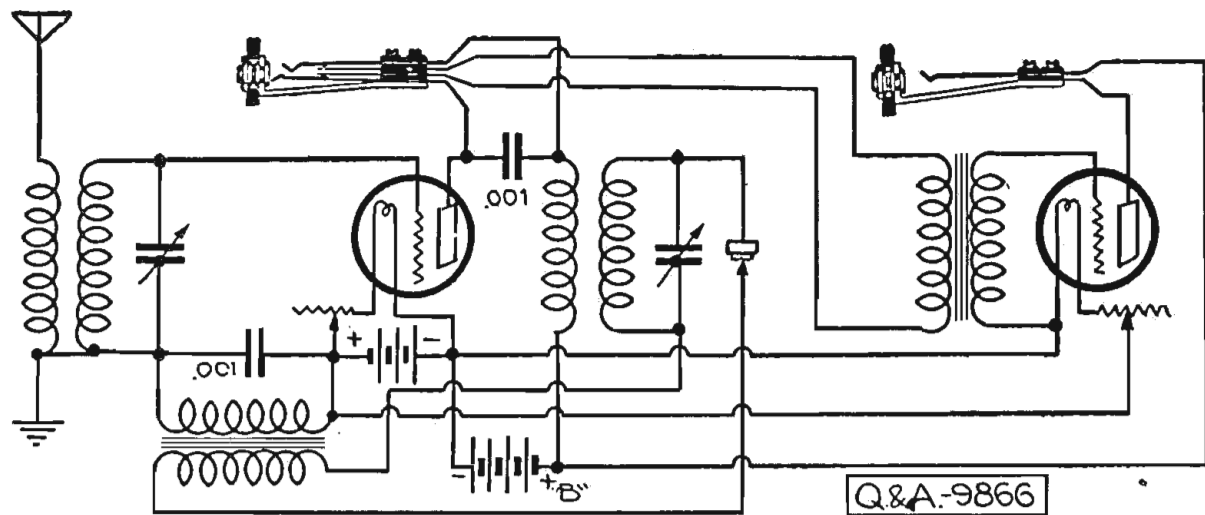
Distinctly New AND EFFICIENT, satisfying every radio fan's wish in performance and price. Our direct sales plan enables us to sell at this low figure. "Bluebird" assures increased range and undistorted volume.

- Type 400—5 Volts, 1 Ampere Detector Tube
- Type 401A—5 Volts, .25 Ampere Amplifier and Detector
- Type 499—3-4 Volts, .06 Ampere Amplifier and Detector
- Type 499A—3-4 Volts, .06 Ampere with Standard Base Amplifier and Detector.
- Type 412—1 1/2 Volts, .25 Ampere Platinum Filament Amplifier and Detector.

All Standard Types... \$2.50

TYPE 402 5 WATT TRANSMITTERS.....\$3.00 EVERY TUBE GUARANTEED to work in Radio Frequency. Especially adapted for Neutrodyne, Reflex and Super-Heterodyne Sets. Shipped Parcel Post C. O. D. When Ordering Mention Type BLUEBIRD TUBE CO. 200 Broadway NEW YORK CITY

Questions and Answers



Reflex with Extra Audio Frequency
(9866) HRH, Turtle Creek, Pa.
Will you please publish or send the hook-up for a reflex circuit with a stage of audio frequency added, also using single and double phone jacks?

A.—We are presenting a diagram showing the addition of one stage of audio frequency amplification to meet your requirements, for the circuit of your interest.

Men to build radio sets in spare time.
Leon Lambert, 501-H Kaufman Bldg., Wichita, Kansas.

Cabinets—5,000 Cabinets, 7 x 18 x 7, \$1.50 each. Enclose 20c postage with order. Haft & Co., 2225 Ditmas Ave., Bklyn., N. Y.

Books! Radio Log! Auto Expenses! Family Budget. 25c each postpaid. Roy Stacy, Rockford, Ill.

Send me your burned-out or broken Power tubes—50 watts or over. Will pay liberally. W. Baker, 36 West 20th Street, New York City.

Radio Reception Stamp Album and Log, 50c each. Special to Radio Dealers, \$4.00 per dozen. Henry Jorgensen, Minden, Neb.

LOG for YOUR Radio
25¢ Record for all stations YOUR set gets. Spaces to enter call, city, location on each dial on YOUR set, and remarks. Log cards in neat, durable rippled binding. Log holding 40 stations, 25c; 100 stations, 50c; 200 stations, 75c; 400 stations, \$1.00; PREPAID.

MONEY REFUNDED if Not Delighted
Send Order with Coin Today—NDW
RADIO PRINTERS, Dept. 3411 Mendota, Ill.

For Sure Results, Solder Up Your Set with SOLOX
The scientific soldering solution that makes sound metallic joints a certainty, with freedom from acid, messy grease or resin. Easy and clean in use and cannot corrode. Most effective and economical of all preparations. Of your dealer or mailed for 50c by the inventors and manufacturers. The D. X. Radio Research Laboratories; Cruisers-on-Hudson, N. Y. Money back guarantee. Dealers: Write for attractive proposition to our national distributors.
THE CHARLES RADIO CO., 154 Nassau St., N. Y. C.

Mailing Lists
Will help you increase sales. Send for FREE catalog giving counts and prices on thousands of classified names of your best prospective customers—National, State and Local—Individuals, Professions, Business Concerns.
99% Guaranteed 5¢ each
33 N. 10th St.

PATENTS
Write for my free Guide Books "How to Obtain a Patent" and "Invention and Industry" and "Record of Invention" blank before disclosing inventions. Send model or sketch of your invention for instructions. Promptness assured. No charge for above information. Clarence A. O'Brien, Registered Patent Lawyer, 2006 Security Bank Building, directly across street from Patent Office, Washington, D. C.

DX "mushy"?
FREE BOOKLET
On "Tube Control" tells how to bring in distant stations clear and loud. Just drop a post card to
UNITY MFG. CO.
232 North Halsted Street
CHICAGO, U. S. A.

ATLAS Matched Tubes
INSTRUMENT-TESTED
Guaranteed to function efficiently in the most exacting circuits. Try them 30 days. Money refunded if you are not delighted. At best dealers, or direct from us for \$3.00
Our guarantee includes safe delivery
SPECIAL OFFER
At no extra charge, we will furnish selected Atlas Instrument-Tested Tubes in matched sets for Reflex, Neurodyne, Radio Frequency, Superheterodyne or other sets. They will improve the performance of any set.
DEALERS: Atlas Matched Tube Sets are in great demand. Write or wire for proposition.
THE R-S-K COMPANY
310 Caxton Building CLEVELAND, D.
771 Elliott Square BUFFALO, N. Y.
609 Chamber of Commerce PITTSBURGH, PA.

ing the addition of one stage of audio frequency amplification to meet your requirements, for the circuit of your interest.

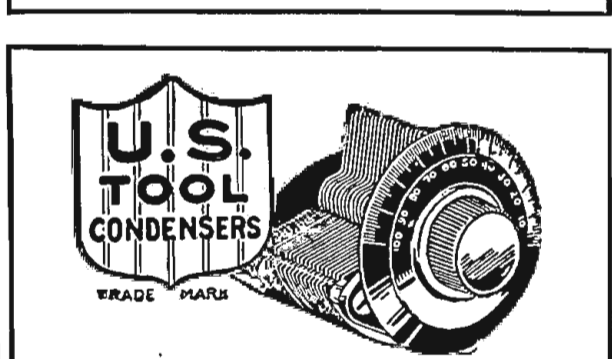
Men to build radio sets in spare time.
Leon Lambert, 501-H Kaufman Bldg., Wichita, Kansas.

It's your money and you can spend it for tubes or batteries if you want to; but I can show you how to bring distant stations in on a simple crystal set. Same plans increase range of tube sets also. Copyrighted plans \$1.00. Complete parts for long distant crystal sets \$5.00. Leon Lambert, 501 Kaufman Bldg., Wichita, Kansas.



EUREKA is a "B" battery that has been tested in service and its superior quality is proved. **GUARANTEED LONG LIFE**

Specially designed to eliminate unwanted noise.
JOBBERS and DEALERS Write for PROPOSITION.
EUREKA BATTERY CO., Inc.
101 Wooster St. New York City



New Hexagon Shaft
Insures Condenser Perfection
To eliminate fanning, the rotor blades are stamped with a hexagon hole and held rigidly on hexagon shaft. Found in types 3 (plain) and 4 (all-vernier), Celoron end plates; types 5 (plain) and 6 (all-vernier), metal end plates.
100% GUARANTEED ASK YOUR DEALER
U. S. TOOL CO., Inc.
122 Mechanic St. NEWARK, N. J.

Micadons
Standard fixed condensers of radio. With permanent capacity. Easily installed. Used in 9 out of every 10 sets made.
Price 35c to 75c
Dubilier
CONDENSER AND RADIO CORPORATION

Detector Tube in Reflex
(10724) RBW, Earlham, Iowa.
Will you kindly send me a diagram showing how to substitute a detector tube for the crystal in my De Forest D-10 set. I am using DV-2 tubes now. What tube should I use for detector? Battery drain is no object.
A.—The substitution of a tube for a crystal detector in a reflex circuit is of debatable advantage and certainly at the sacrifice of signal quality, generally. The usage of a crystal detector in this type of a circuit is not primarily based upon economy, but because the audibility of a

Write for Our Free Book on Patents—
Munn & Co. 643 Woolworth Building, New York City; 518 Scientific American Bldg., Washington, D. C.; 407 Tower Bldg., Chicago, Ill.; 360 Hobart Bldg., San Francisco, Calif.; 215 Van Nuys Bldg., Los Angeles, Calif.

FREE Log for YOUR Radio
With first order ONLY. Spaces to enter calls, cities, location on each dial on YOUR set, remarks, etc. Log cards in neat durable rippled binding.
Send NO Money Hear What YOU Like

Stations gladly put on numbers at your request. We print cards that get ATTENTION.
SAMPLE CARD FREE
Thank your favorite stations ALL THE RAGE and talent they appreciate as musicians on the stage. Be up-to-date. Get more pleasure out of your radio. Save letter postage and stationery. So convenient. Use Postal applausé cards.
YOUR OWN NAME AND ADDRESS PRINTED FREE
on each card. Be individual. Good grade cards. Quality printing. Attention Getting Thank You Cards: 100 only—\$1.00; 200—\$1.60; 300—\$2.00; 500—\$3.00; 1000—\$5.00; (only 1/2c each). PREPAID if you prefer to pay with order. **Money Refunded if Not DELIGHTED**
Don't send one cent. Pay postman after cards arrive. Order Today—NDW. A postal will do.
RADIO PRINTERS, 6411 Main Street, MENDDTA, ILL.

SOLVED!
—The "B" Battery Problem
Throw away your "B" Batteries and install a Kellogg Trans-B-former. It gives you "B" Battery current direct from your electric light socket at the trifling cost of one-fifth of a cent per hour. Gives better reception—no interferences. Write for details.
KELLOGG
SWITCHBOARD & SUPPLY CO.
Trans-B-Former
1066 W. Adams St., Chicago, Ill.

FOR A LIMITED TIME ONLY
You can purchase for \$3.50 a 22 cell 24 volt RABAT SENIOR battery. Saving \$6.10 through direct buying. The Jobber and Dealers profit now is yours. 24 cell 48 volt size \$7.00.
Rabat Senior Batteries
are neat, powerful, noiseless and will harmonize with any Radio Set. Separate cells and patented rubber cork prevent current leakage and clear glass tubes give vision of the condition of battery. Heavy duty plates 1 1/2 x 1 1/2 x 2 1/2, with staggered ribbed grid form the backbone of this sturdy battery. Shipped completely charged ready for instant use and you can save \$6.10 by ordering now.
RABAT JUNIOR BATTERY \$2.15 c. o. d.
(12 CELLS 24 VOLTS 1200 M. A. CAPACITY)
Incomparable in price and performance. Designed to satisfactorily operate sets equipped with 3 tubes or less. Constructed of the same high grade materials as used in our Senior battery. Shipped dry, uncharged. Order today and save \$1.81.
Rabat batteries can be recharged at home at a very low cost.
Rabat Super-Charger \$3.00 c. o. d.
Is specially designed to satisfactorily recharge any make of storage "B" battery. Shipped complete ready to use including lamp socket, attachment plug and cord. You save \$1.80 by ordering direct.
SEND NO MONEY
But write us today, advising quantity and type wanted. After examining and approving these wonderful batteries then pay the Expressman the small C.O.D. charges.
The Rabat guarantee is back of all our products. DON'T WAIT ORDER TODAY and save the middleman's profit.
THE RADIO RABAT COMPANY
1767 St. Clair Avenue, Cleveland, Ohio

crystal as a rectifier is just as good as a three element tube. However, the substitution of a two element tube, Diode, for crystal is a simple matter. This uses only a dry cell battery as a filament source. Its particular advantage lies in that it does not require adjustments. Its position and leads are identical except for the addition of positive and negative battery connections.

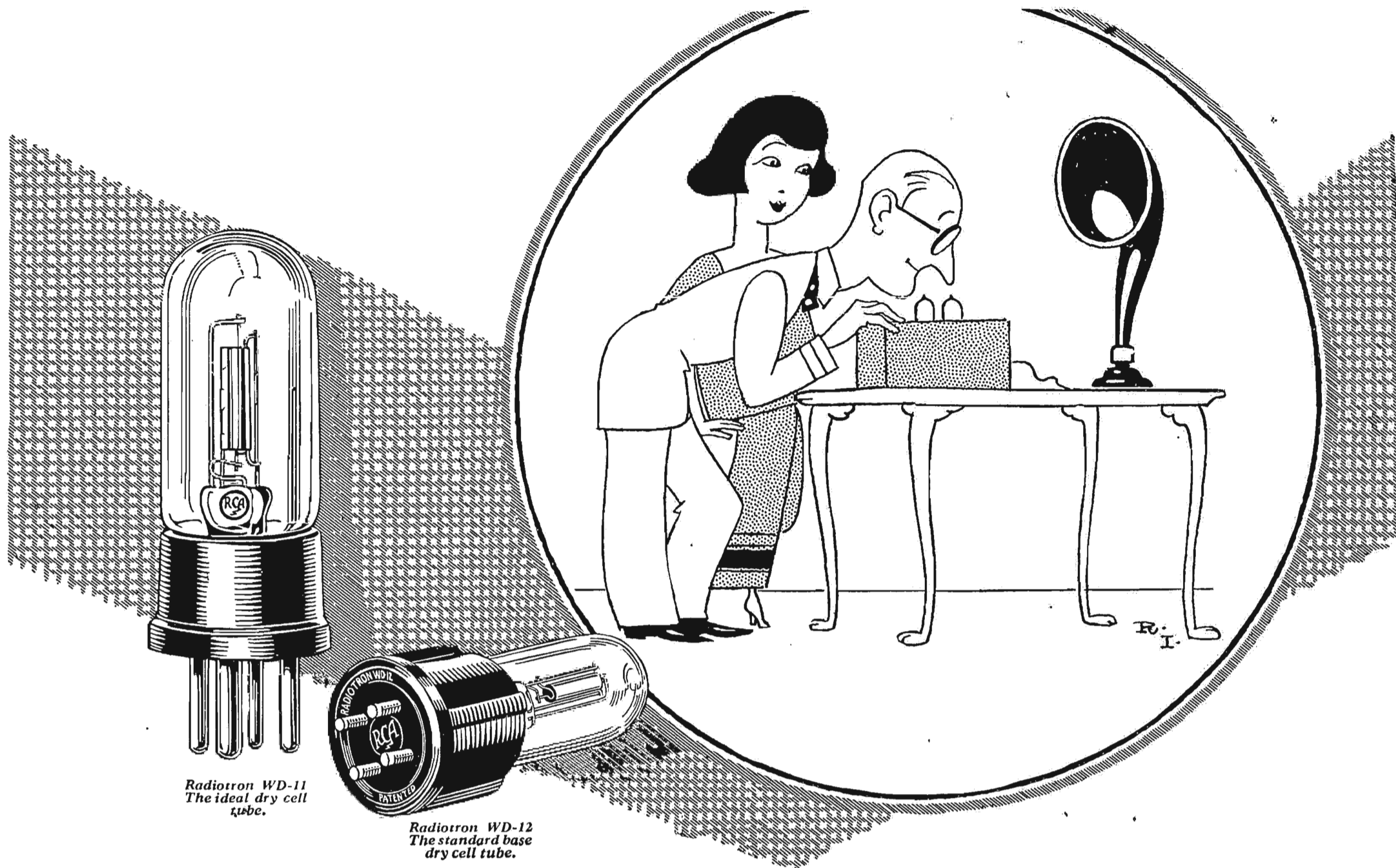
GO into the RADIO BUSINESS
We specialize in Equipping New Dealers with entire stock—advice free. Send for Our Radio CATALOG & BARGAIN LISTS Wholesale Only
MANHATTAN RADIO CO.
112 Trinity Place NEW YORK CITY

Send for this Money-Saving Radio and Electrical Catalog today.
Wholesale Only
GERSHON ELECTRIC COMPANY
Walnut St., Kansas City, Mo.

PATENTS SECURED
Radio Investments a Specialty
Trade Marks Registered
WRITE US
Mason, Fenwick & Lawrence
Patent and Trade Mark Lawyers
Washington, D. C. New York Chicago
Established Over 60 Years
REFERENCES:
National Confectioners' Association, Chicago; National Canners' Association, Washington, D. C.; Life Savers Inc., Port Chester, N. Y.; Bon Ami Co. and U. S. Cigar Co., New York City; Hershey Chocolate Co., Hershey, Pa.; Stephen F. Whitman & Son, Philadelphia, Pa., and many others.

TRY US!
RADIO DEALERS!
We are exclusive Radio Jobbers and DO NOT RETAIL.
Howard—Crosley Liberty—Day-Fan Receiving Sets
Complete line of parts. We Sell to Dealers Only.
Write for Catalog!
TAY SALES CO.
6 N. Franklin St., Chicago

ROICE
Radio Tubes
Economical and Powerful
CUT your tube expenses in HALF. Here's "Roice," an efficient and durable tube that gives longer service and greater satisfaction. Powerful; increases range and volume with maximum clearness. We sell direct only. You save by this plan; that enables us to sell "Roice" at this low price.
Type 00—5 Volts, 1 Ampere Detector Tube
Type 01A—5 Volts, .25 Ampere Amplifier and Detector
Type 99—3-4 Volts, .06 Ampere Amplifier and Detector
Type 99A—3-4 Volts, .06 Ampere with Standard Base Amplifier and Detector
Type 12—1 1/2 Volts, .25 Ampere Platinum Filament Amplifier and Detector
ALL STANDARD \$2.50
Shipped Parcel Post C. O. D. TYPES
Type 02 5-watt Transmitters, \$3.00
All Tubes Guaranteed
to give best results in Radio Frequency. Also for high-powered circuits such as Neurodyne, Reflex and Super-heterodyne sets.
When Ordering Mention Types
ROICE TUBE CO.
21 Norwood St. Newark, N. J.



Radiotron WD-11
The ideal dry cell
tube.

Radiotron WD-12
The standard base
dry cell tube.

Get a good detector

What will Radiotrons WD-11 and WD-12 do as detectors? These are the same—but with different bases. First—they are sensitive to weak signals—superlatively sensitive, as remarkable distance performances show in thousands of one-tube sets. Second, they are good “oscillators” — and that is important in regenerative circuits. And third, they are quiet in operation—add no electrical noises to the music, or speech. Radiotrons WD-11 and WD-12 are famous as audio and radio frequency amplifiers, too, and have made possible the hundreds of thousands of dry battery receivers that are in use today. They mean clear, true reception—over big distances—with dry batteries! Be sure to get a Genuine Radiotron.

Radiotrons WD-11 and WD-12 are the same tube but with different bases.

Radiotron WD-12 has a standard navy-type base. Use it to change your set to dry battery operation. Ask your dealer today.



This symbol of
quality is your
protection.

RADIO CORPORATION OF AMERICA

Sales Offices:

233 Broadway, New York 10 So. La Salle St., Chicago, Ill. 28 Geary St., San Francisco, Cal.

Radiotron

REG. U. S. PAT. OFF.