

# Radio Digest

EVERY WEEK **Illustrated** TEN CENTS

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

Vol. IX

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By Radio Digest Publishing Co.

SATURDAY, MAY 31, 1924

No. 8

## A. T. & T. GETS ARMSTRONG

### WGN OWNERS BUY WDAP REPORT SAYS

#### DRAKE HOTEL CALL MAY BECOME MEMORY

Chicago Tribune and Board of Trade  
Station Principals in Rumored  
Transaction

CHICAGO.—What is claimed to be a reliable source of information reports that Station WGN, the Chicago Tribune, will hold an opening program at a new location June 1. The story circulated is that the Tribune has purchased the Board of Trade station, WDAP, located on the Drake hotel, this city, and will move its call letters to the new location with the June 1 opening program.

The call WDAP will, it is said despite the shroud of mystery surrounding the transaction, be only a memory after that date.

#### Wave Lengths Still Unsettled

The call, WJAZ, still held by the Chicago Radio laboratory and formerly used for the station at the Edgewater Beach hotel, will go on the air again following the removal of the Tribune's participation in the operation of that station.

While generally misunderstood, the Tribune never did own the equipment of Station WJAZ. When the call was changed to WGN, representing a slogan

(Continued on page 2)



Mable Norman (above), the petite and dainty blondom star, recently gave a very amusing talk from Station WTAM. Geraldine Snyder (left), soprano solo star at Station WGR, Geneve Schafar (right), recently told WGO listeners her experiences in India and Arabia.



### Cardinal Hayes Broadcasts Message from Station WEA

NEW YORK.—His eminence, Patrick Cardinal Hayes, delivered a message on Catholic charities to the radio audience of WEA, New York; WCAP, Washington, D. C., and WJAR, Providence, R. I., on a recent Sunday evening, during a program specially arranged to interest the audience of the three broadcasting stations.

The boy choristers of St. Stephen's church sang for the program. Cardinal Hayes, it is to be noted, as auxiliary bishop of New York was for some years the pastor of St. Stephen's church.

### CIRCUITS ARE PROPERTY OF PHONE TRUST

Court Decision for De Forest  
Really Gives Telephone  
Company Most Rights

#### Puzzles Manufacturers

Licenses Wonder What Next Move  
Will Be — General Electric  
Shares Right to Make

NEW YORK.—The recent decision of the Court of Appeals of the District of Columbia which, in effect takes the patent rights to regeneration away from Edwin H. Armstrong and the Westinghouse company and gives them to Dr. Lee De Forest and the De Forest company, has the makers of regenerative sets worried and wondering just where they stand.

If the question of licenses were purely up to the De Forest company, there would be no doubt as to the granting of licenses to responsible manufacturers, and espe-

(Continued on page 3)



# No. 2 OFFICIAL BALLOT

## Announcers' Contest

### RADIO DIGEST FIRST ANNUAL GOLD CUP AWARD

Gold Cup Award Editor, Radio Digest,  
510 North Dearborn St., Chicago, Ill.

Please credit this ballot as one vote for:

..... of Station .....  
(Announcer's name) (Call letters)

Signed .....

Address .....

5-31-24 City..... State.....

If you desire, tell below in five or less words what you most like about the announcer for whom you have cast this ballot:

## FANS RUSH VOTES FOR '24 MIKE KING

### GOLD CUP AWARD ROUSES WIDESPREAD INTEREST

Returns Heavy as Listeners Clip-Ballots for Favorite Announcers in Radio Digest Contest

Widespread interest has been created since the announcement last week of the First Annual Radio Digest Gold Cup Award to the most popular broadcast announcer in the world. Returns already in the office of the Radio Digest promise that this will be one of the greatest contests in which the Radiophan has ever had the good fortune to participate.

On page two is the second of the official ballots which will appear for sixteen consecutive weeks. The first appeared last week.

The gold cup to be given to the victor selected by the listeners' ballots in this 1924 competition was shown in last week's issue and is patterned after the microphone, symbolic of the gateway to the listening world, a thing of beauty both in line and symmetry and worthy of a place of honor in any station.

#### No Limits to Votes Cast

Remember that each ballot counts as a vote for the announcer whom you name. Any Radiophan may send in as many ballots as he desires.

The rules provide bonus votes when consecutive ballots are saved and sent in together.

It is expected that the contest will bring out a new class of announcers, men and women who enunciate clearly and speak with well-modulated voices which will provide inspiration for the listeners in. It will also help to raise standards by which the announcers are judged. From the results will be determined just what is needed to qualify as a good announcer.

The Radio Digest Gold Cup Award is to be an annual trophy to be presented to the most popular announcer in the world. Radiophans will be given the honor of picking the "king" each year to whom the gold cup will be presented.

#### Open to Announcers World Wide

This contest is open to every country in the world. Canada is the first country outside of the United States to nominate an announcer up to the time this issue goes to press.

Unencumbered by precedent, the announcers' contest is expected to divulge much of interest to listeners, broadcast stations, their artists and the Radio industry in general. As broadcast announcers are a large factor in the success of any station, it is expected that much interest will be aroused, and Radiophans are asked to support their favorite announcers.

Some Radiophans may be undecided as to their favorite announcer. This has been provided for by having sixteen ballots so that a Radiophan may split his vote between two or more announcers.

#### Nominations Being Received

Any listener in anywhere is eligible to nominate one or more well-liked announcers he may have in mind. All that the Radiophan has to do is to cut out the nominating certificate on page five, fill and send it in. This will enter the announcer in the contest so that anyone may vote for him.

Many announcers have distinguishing characteristics and little witticisms which appeal to the listening Radiophans. These undoubtedly will help some announcers to become more popular as the voting proceeds.

Regardless of the location of a station a person may nominate or vote for the announcer of that station.

## Peru Hears All-Spanish Concert Sent by WHAZ

TROY, N. Y.—Broadcasting an all-Spanish concert Station WHAZ was heard in Arequipa, Peru, according to a letter received here recently.

Clear reception of the entire program with a loud speaker plugged in on the detector was reported. This transmission of four thousand miles in a direction at right angles to the aerial of Station WHAZ is regarded as remarkable. This station has been heard in New Zealand and in Norway.

#### Austria to Twist the Dials

WASHINGTON, D. C.—Regular broadcasting was expected to commence in Austria on July 1, a concession for the purpose having been granted to a group composed of banks and electrical firms.

## BERLIN RECEIVER GETS CONCERT FROM WBAH

Sensitive Set Used in New Record for Dayton

MINNEAPOLIS.—WBAH, the Dayton company station, located here, has established a new long distance record by having been heard in Berlin, Germany. A letter received recently reads: "It pleases us immensely to be able to inform you that occasionally with the aid of our very sensitively tuned receiving apparatus in our laboratory, we have heard your sending station, WBAH."

"For instance, we recently received very clearly parts of the concert from Macalester college as well as entertainment by the third regiment band. We congratulate you for this accomplishment, and would appreciate your sending schedule of program and any technical data concerning your station."

The message was signed, S. Crin, Radio Frequenz, Gmb. H., Berlin, Germany.

## WGN TAKES OVER WDAP

(Continued from page 1)

used by the Chicago newspaper, the significance was merely that the Tribune was participating in the furnishing of programs for the former WJAZ.

It is believed that the Tribune, desiring to have a station it could call its own, found it impossible to purchase the Chicago Radio Laboratory equipment and therefore negotiated the acquisition of WDAP.

At the time of writing, information regarding wave length changes was not available. It was believed however, that WJAZ would keep 370 meters and WDAP as it becomes WGN, would still use its 360-meter wave.

#### Issue Measurement Circular

WASHINGTON, D. C.—The Bureau of Standards has issued a circular giving information concerning the most important instruments and measurements used in Radio work. Special attention has been given to electron tubes because of their extensive use in Radio measurements as current generators, detectors, etc.

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## Looking Ahead

Installing a Radio Set in An Essex is the next installment of how to install a Radio set in your automobile. This will describe the details of the cabinet as well as the installation of the set. It is written by H. J. Marx.

Catching Your Radio Waves is an article by P. E. Edelman to appear next issue. It will show just how the Radio waves are caught and brought into your set. This is a very interesting A-B-C series and is written so that you can understand it.

A Real Hook-Up for DX Reception by one of our readers is one of the feature articles in the next issue. This is written by a real fan who likes to play with circuits that work.

Don't Forget to Pick Your Favorite Announcer—then send in the ballot, in each issue, to the Gold Cup Award Editor as a vote in favor of the voice you like the best.

Take Radio Digest with You on Your Vacation

WHEN YOU WANT

# Radio Digest

YOU WANT IT!

BE SURE OF YOUR WEEKLY COPY BY SUBSCRIBING NOW

SEND IN THE BLANK TODAY

Publisher Radio Digest,  
510 N. Dearborn St.,  
Chicago, Ill.

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

Name .....

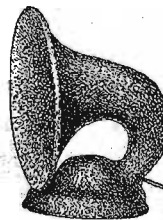
Address .....

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

## USE-IS THE TEST

### Build Your Radio Set With Kellogg

## Guaranteed Parts



KELLOGG Reproducer fulfills all the requirements for home reproduction. The music or voice is projected clearly and distinctly with ample volume.

The horn is of special acoustical fibre which prevents the "tinny" sound.

A special Kellogg unit of 2500 ohms resistance is used which delivers the speech or music with head set clarity. A type for every use. Hear one today.

Kellogg Reproducers increase the value and pleasure of your set. If your dealer does not handle Kellogg, communicate direct with us.



**Kellogg Switchboard & Supply Company**  
1066 W. Adams - CHICAGO

## USE-IS THE TEST

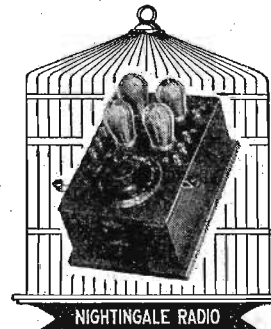
HANSEN BIRD CAGE LINE

# 'NIGHTINGALE'

4-TUBE RADIO SET

**\$32.50**

WITHOUT ACCESSORIES



It is simplified Radio at its best and at a price within the reach of all. It is small but has a 2000 mile range with a loud speaker. Its small size makes it ideal for vacations or auto trips. One stage of R. F. helps to reduce static.

Hansen **MOCKINGBIRD**.....\$90.00  
6 Tube Long Distance Loop Set.

Hansen **MEADOW LARK**.....\$180.00  
6 Tube Set in a Beautiful Cabinet

Write for Literature

DEALERS—A wonderfully attractive proposition

JOBBERS—We want one responsible and active distributor in each state.

National Distributor  
**HANSEN STORAGE CO.**  
"The Million-Dollar Warehouse Company"  
RADIO DEPARTMENT  
134 Jefferson Street **MILLWAUKEE**  
DISTRICT DISTRIBUTORS  
United Auto Supply Co.....Columbus, Ohio  
Reins & Meiss Co.....Cincinnati, Ohio  
Penn. Nightingale Co.....Bellevue, Pa.  
Engler Radio Co.....Milwaukee, Wis.



# REGENERATIVE SET BUILDERS UP TREE

## NEUTRODYNE AND SUPER-HET ALSO EFFECTED

A. T. & T. and De Forest Get Big Plum Through Courts—Reversal of Patent Decision

(Continued from page 1)

cially those who have built large factories and purchased great quantities of raw materials for sets. Unfortunately however, the decision does not lie with the De Forest company.

### De Forest Cannot License

The question was put to S. E. Darby, Jr., counsel for De Forest, whether, if the court sets aside the Armstrong patent, the De Forest company would license such licensees as hold rights at present from Armstrong.

"I believe," Mr. Darby replied, "the courts must set the Armstrong patent aside in the proper procedure brought for that purpose, but the De Forest company cannot grant licenses to the Armstrong licensees by virtue of its contract with the American Telephone and Telegraph company of March 16, 1917. The Telephone company can grant licenses in certain fields under the patent, but whether or not it will do so, I am unable to pass upon. The De Forest company can grant no further licenses, other than that given the Telephone company."

### Does this Give R. C. A. Glimp on Others?

To dominate the Radio field has long been the goal of the Radio Corporation of America, the Westinghouse and General Electric companies and the telephone company. Internal friction there has been, but the agreements between these companies have held, because in their united action and cross-licensing lay strength and possible domination.

How strong is the tie between the phone company and its three allies? That is the question. The phone company was left out of the profits possible from manufacture of receiving apparatus and collects only royalties on the patents which it owns or is licensed to use and which it in turn licenses the others to use.

### E. Kolds License

On this subject Mr. Darby states, "The telephone company has already granted a license to the General Electric company. It is a fundamental principle of law, however, that a licensee may not sue for infringement of a patent without joining the owner of the patent as a party-plaintiff."

"At the request of the telephone company, the De Forest company has joined as a party-plaintiff in litigation based on De Forest's patents, but the De Forest company at no time has recognized the right of the Radio corporation or the General Electric company or anyone other than the Telephone company to file suit on the De Forest patents without the De Forest company voluntarily joining as a party-plaintiff in such suit."

Thus it looks as though neither the Radio corporation nor General Electric can do anything to stop competition in the manufacture of regenerative sets without the Telephone company. And as yet the telephone company has not stated its policy on this matter.

### Neutrodyne and Super-Het Affected

Other circuits than those incorporating regeneration as an asset will doubtless be affected by the far-reaching decision. The neutrodyne circuit, patents on which are now held by Professor L. A. Hazeltine, involves the control of regeneration or oscillation in tubes used as Radio frequency amplifiers.

But so broad are the rights granted Dr. De Forest in the fourteen points involved in the recent controversy that action in respect to the neutrodyne may be expected. The super-hetrodyne, "Rolls-Royce of Radio," incorporating as it does an oscillator, either in a separate tube or combined with the "first detector," must in some way come also under the new De Forest rights. Here again, comes the question of who will be licensed.

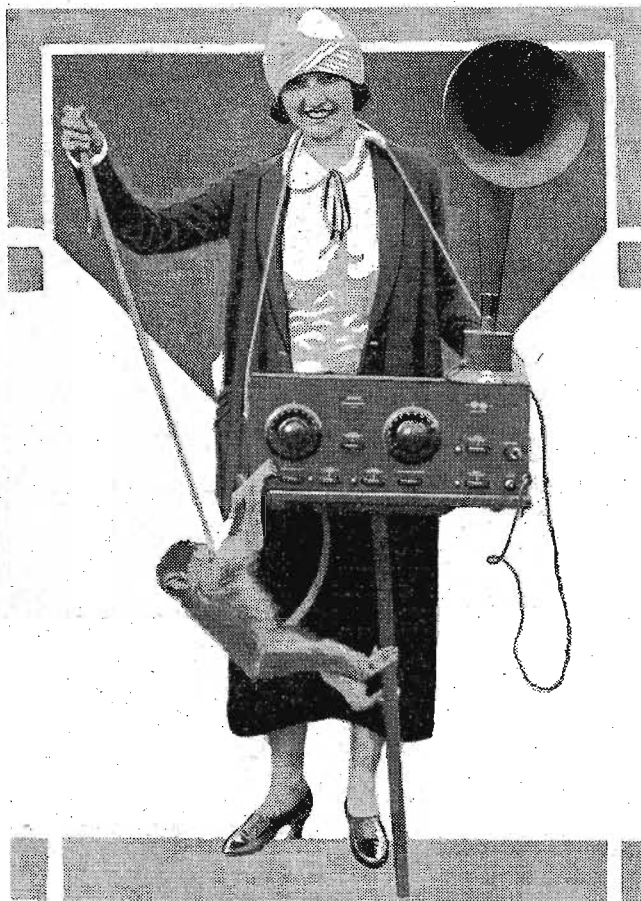
## EAGLE MAKES LUNCH COUNTER OF AERIAL

CLEVELAND.—Considerable excitement was caused at Station WTAM here recently, when a large American eagle picked the station's aerial towers as a feeding place. The eagle had caught or stolen a large fish which was still alive as the eagle fed, and could be plainly seen from the street as it flopped under its captor's talons. The eagle's visit lasted over half an hour.

## SNAKES COURSE NOW AT COLLEGE STATION

STATE COLLEGE, PA.—Educating the public so that they can tell a rattlesnake when it gives its warning, is the latest extension university stunt to be broadcast from Station WPAB located here. Rattlesnakes will be taken to the studio in a wire cage and coaxed to give their characteristic signals of warning. Here's your chance to hear snakes without being bitten or drinking moonshine.

## URNS DIAL INSTEAD OF CRANK



Recent visitors to New York's East Side have been surprised to find the old-fashioned hurdy-gurdy and organ grinders replaced by the more modern arrangement shown herewith. Lura Walters, who posed for this photo, claims the financial returns are well worth the investment in the Radio receiver. Photograms Photo.

## First Receiving Sets on Transcontinental Trains

OTTAWA, ONT.—The Canadian National Railways is believed to be the first railroad organization to equip transcontinental trains with Radio receiving sets as a regular part of their equipment. The company has put sets in all its transcontinental trains and has established a Radio department to supervise installations and operation, according to Walter C. Anderson, a Canadian National Radio operator.

## Old Fashioned Spark Sets in Navy, Doomed by Tube

WASHINGTON.—Recent Radio communication advances in the Navy include the gradual elimination of spark sets and the substitution of tube transmitting sets. Spark sets have been almost eliminated now. The employment of multiplex Radio operation, and the application of automatic recorders in the reception of Radio press reports are other advances effected recently.

## NEW BROADCASTING METHOD TRIED OUT

### ELIMINATES CARRIER WAVE IN RADIOPHONY

Three Distinct Advantages Are Claimed for New System; Foreign Sounds Abolished

URBANA, ILL.—Transmitting without the use of carrier waves is the latest step in Radiophony which is being conducted at Station WRM, University of Illinois, located here. Scientists connected with the institution claim that it will revolutionize broadcasting and receiving.

Tests have brought responses from all over the United States that signals, broadcast by the new method, discovered and in course of perfection at the university laboratories, came in "loud and clear."

### Eliminates "Strays," Claim

Under the principle of broadcasting now in use, the carrier wave, constantly going out, conveys all manner of sounds, and only the modulation intensity of the sound frequency and the action of the detector tube or crystal in stripping the modulation frequency of its carrier wave to more or less degree, enables the particular voice or music frequency to be heard at the receiving end. More often than not the modulation frequency is not stripped of foreign frequencies borne on the carrier wave, such as static and "strays," and these, too, become audible sounds.

By means of the new device in use at the university station only the modulated frequencies of voice or music are broadcast. These, according to the college scientists, are devoid of the carrier wave tendencies to pick up extraneous frequencies.

### Sending Efficiency Increased

Three distinct advantages are claimed for the new system: Tuning is made more selective at the receiving station because of the sharper decrement in tuning out the station at the receiving is easier for the same reason, and sending efficiency is increased. It is asserted that much greater distance may be covered than possible at present, with reception at 3,000 to 5,000 miles of much higher quality than possible now at 1,000 miles.

Station WRM serves the dual purpose of broadcasting the events of the institution and serving as an experimental station.

## High Power Broadcast Test at Station WIP

Radiophans from Coast to Coast Listen Till Wee Hours

PHILADELPHIA.—Station WIP, Gimbel Brothers here, recently conducted a high power transcontinental broadcasting test in an effort to reach every state in the union by Radio. The station's engineering staff has been at work to increase its power output and make several tests of broadcasting apparatus.

Radiophans on the Pacific coast sat up until four o'clock in the morning listening to the high power test program, it is believed.

A program featuring many theatrical stars was broadcast. On the program were Harold Leonard and his Red Jackets; Enrico Ansoni, operatic tenor; Earl Lindsay's Cutrix Revue of 1924, from the Club Madrid; Alberta Fowler, Dottie King, Emma Semler and Agnes Dawson, soloists; principals from "Running Wild," with the original New York cast from the Garrick Theatre, and the Adelphe Male Quartet.

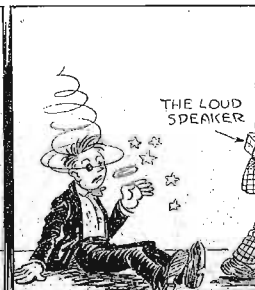
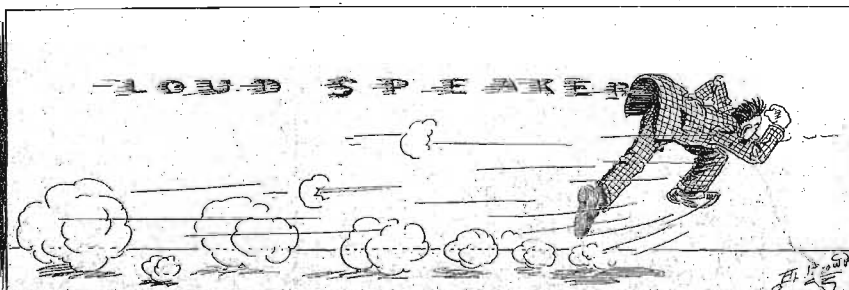
### Praise Sunday Concerts

CINCINNATI.—Hundreds of appreciative letters received regarding the Sunday evening symphony concerts broadcast from Station WLW, show there is a nation-wide audience of shut-ins who desire the programs to be continued. Plans have been made for continuing these under the direction of William Koop.

## THE ANTENNA BROTHERS

Spir L. and Lew P.

Part IV—And So He Did



# TOPSY AND EVA' GO INTO MAKING SONGS

## DUNCAN SISTERS START AS MUSIC PUBLISHERS

### Will Not Join American Society—Rosetta Criticizes Jazz Songs Without Sentiment or Purpose

CHICAGO.—"People are getting sick and tired of such songs as 'You've Got to Kiss Mama' and 'Two Time Dan.' They want more solid themes—something to make them think," said Rosetta Duncan when interviewed regarding her recent debut with her sister, Vivian, in the music publishing business as Duncan Sisters Music Publishers.

With their embarking on the song publishing venture came a grand opening that even made Chicago sit up and rub its eyes. Mayor and Mrs. William Dever, Chief of Police Collins, dramatic critics and stage celebrities from far and near were present.

The opening also provides a new source of good music for broadcast stations, for Duncan Sisters Music Publishers will remain independent, and will not join the American Society of Composers, Authors and Publishers or its allied interests.

### Witmark Sells Out Offices

M. Witmark and Sons, New York music publishers with offices in Chicago, provided the offices and furniture for the venture of the famous sisters. Witmark, member of the American Society that is opposed to the free broadcast use of music, found business such that he closed the Chicago and all other branch offices outside of New York.

When the American Society publisher closed his Chicago office, the Duncan sisters took over his lease, bought his office equipment, hired his Chicago manager, John Conrad, as their general manager, and had their grand opening party.

### Duncan Sisters Like Radio

"We are sold on the value of Radio publicity," said Rosetta Duncan. "We have observed the marvelous stimulus it has given our various shows. 'Topsy and Eva' has thrived on the few times it has gone on the air."

The Duncan Sisters Music Publishers begin their business with a catalogue of thirty-seven numbers. It is not the purpose to publish only the songs of the popular pair, but to take the best from many writers.

# OPERA COMPOSER IS RADIOPHAN IN PARIS



Gustave Charpentier, famous French composer of the opera "Louise," is an enthusiastic Radiophan. He considers Radio as the future means for educating people to a greater appreciation of music.

K. & H. Photo

# "Big Bill" Edwards Speaks from WEAF to Radiophans

NEW YORK.—William H. Edwards, internationally known as "Big Bill," formerly collector of internal revenue and in his competitive days captain of the 1900 Princeton football team, recently addressed WEAF's listeners for the American Olympic committee. He had as his topic, "The American Boy and the Olympic Idea."

Providence Has First Show  
PROVIDENCE, R. I.—Rhode Island's first Radio show was held here recently in the State armory. "Roxie" and his "gang" from the Capitol Theater, New York, helped in the opening of the show.

# Boy Scouts Hold Radio Party; Pioneer Talks

## Asks Scouts to Lend Help to Enforce Ether Laws

NEW YORK.—Speaking recently before one of the largest Boy Scout audiences gathered together in a New York auditorium, Pierre Boucheron, one of the first Radio amateurs in the United States, whose entry into the ranks of the experimenter dates back to 1906, predicted that broadcasting would lead the way to the formation of an international Boy Scout organization in which the scattered groups of young men in the principal cities of the world would enjoy relationships far more intimate than any other agency has thus far been able to provide.

Mr. Boucheron also pointed out that the limited number of available wave lengths in the ether required the strict observance of laws governing Radio and asked Boy Scouts of America to pledge their support to the work of the Department of Commerce in enforcing these laws.

# DETROIT COP "FLYERS" DIRECTED BY AIRWAVE

## Radiophans Now Hear Emergency Calls to Their Police

DETROIT.—The Detroit police department, KOP, is now directing its "flyers" and even emergency repair trucks of the Detroit street railway, which is owned by the city, by means of its broadcast station.

It is no unusual thing now for listeners in to hear orders directed to Police truck No. 1 or Police truck No. 2. Sometimes they are ordered in or directed to another part of the city, as the occasion may require. It is quite common now to hear KOP in the air say, "D. S. R. truck No. 2. A trolley break is reported at Woodward avenue and Seven Mile road," or at some other part of the city.

In this way the police "flyers" and the street railway repair trucks, while out on service, may be directed instantly to any place desired. The new arrangement is found exceedingly efficient and a great saving to the city.

Plain type 3-plate \$1.25, 5-plate \$1.50, 13-plate \$2, 17-plate \$2.50, 23-plate \$2.75, 43-plate \$3, at dealers.



Vernier type: 13-plate \$4, 23-plate \$4.50, 43-plate \$5.50, at dealers'.

# A Condenser You'll Never "Cuss"

It's built to outlast several sets. Doesn't "cut out" or develop wobbliness after brief use. "There's a Reason:" plates—instead of being spaced by wearable washers, solder, etc.—are accurately pressed and everlastingly aligned and locked in strong grooved support rods which, in turn, are securely fastened in 3/16" Bakelite end plates. Nuff sed. Insist on

# WALNART VARIABLE CONDENSERS

Keep your set always at its best. Be able to tune accurately and quickly. The last place to look for trouble is in a Walnart Condenser! Let us mail you a folder of our complete line.

"Makers of good goods only"  
**WALNART ELECTRIC MFG. CO.**  
Dept 437 Chicago



# The GREBE CLARIFIER

THE first practical, workable solution of the problem of radiation from regenerative receivers. Unlike the "wave-trap" it increases signal intensity.



\$30

- Increases Selectivity
- Increases Signal Intensity
- Improves Quality
- Prevents Radiation

And—  
**Is Easily Connected**

Ask your dealer or write for literature

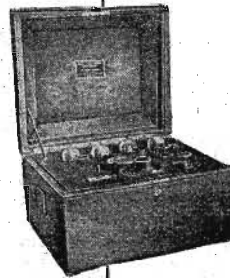
**A. H. GREBE & CO.**

Richmond Hill, N. Y.

Western Branch—461 East 3rd St., Los Angeles, Cal.

# Bristol Single Control Radio Receiver

Using Grimes Inverse Duplex System  
Patents Pending



### Most Simple to Operate

The set for those who want results with little effort. Anyone in the family can quickly learn to operate. It because technicalities and guesswork are eliminated—One Control Dial does it all.

### Does Not Interfere With Your Neighbor

Other close by reception is not disturbed when you tune in with this non-radiating Receiving Set. It gives you a comfortable sensation of freedom to be able to change from one station to another knowing that you will not interfere with your neighbor's receiving.

### Choice of Aerial or Loop

Where conditions make it difficult to install an outside aerial, as in congested sections of cities, good results can usually be had by using inside Loop. In fact, the directional feature of the Loop often brings in stations not possible with a stationary aerial.

Mounted in solid mahogany case with walnut finish, the Bristol Single Control Radio Receiver is handsome in appearance. The price is \$130.00. Bulletin AY-3013 describing this set will be mailed on request.

# BRISTOL

TRADE MARK  
**AUDIOPHONE**  
REG. U. S. PAT. OFFICE



# Loud Speaker

This is known everywhere as the Loud Speaker with the quality tone. Not only is the tone natural and without mechanical distortion, but is sufficiently big in volume to be easily heard in a large room or all through the house. Comes to you ready to use—no auxiliary batteries are required.

Made in three models:

- Audiophone Senior.....Price, \$30.00
- Audiophone Junior.....Price, 22.50
- Baby Audiophone.....Price, 12.50

**THE BRISTOL COMPANY, Waterbury, Conn.**



# BEFORE THEY THOUGHT OF "MIKES"



Walter Wilson, more often known as "Uncle Bob" of Westinghouse KYW, Chicago, occupied the same position last week in the row of announcer photos, but of course he had no 285-pound smile when at the skirt wearing age.

Above, an announcer at K—, located in the great Northwest. At right above, Mr. Sch—, announcer for W— on the Missouri river. Can you guess? Tell you about them next week.

The happy little fellow with the cherub-like smile spread all over his features, shown at the right of announcer's row last issue, is not a soul other than Edwin L. Tyson (above), famous voice of WWJ, the Detroit News, first newspaper station.

## CANUCKS TO CLAIM STRONGEST STATION

### CKAC IS COMPLETING NEW 7,000-WATT PLANT

#### French-Canadian Studio Will Be Departure in Broadcasting Rooms, Utilizing Echoes

MONTREAL.—CKAC, owned and operated here by Canada's largest newspaper, La Presse, and the acknowledged French Radio university, it is claimed, will soon boast of the most powerful station in the world. A 7,000-watt "All Canadian Make" Marconi set will send forth a message of goodwill to French Canadians scattered all over Canada and the United States at the beginning of June, when both the new installation and the entirely renovated studio will have been completed.

CKAC at present time is operating on 2,000 watts, and resorts to an all-remote control system of entertainment following the destruction of its \$80,000 studio which burned down April 26, as the consequence of a faulty flashlight apparatus used in photographing a new microphone. The transmitting room and apparatus were spared.

#### New Studio Revolutionary

Rebuilding of the studio will revolutionize the laws governing the interiors of broadcasting rooms. Instead of resorting to the all-felt padding, with over draperies of silk and velours, the La Presse broadcast studio will be one where echoes will prevail at their height.

The finish will be in carved ivory panelling for walls and ceiling, tiles and cork will be used for flooring. This scheme is intended for the purpose of getting the full tones out of the specially built Casavant electric pipe organ, within the studio walls. When a dulling effect is required, a system of wall curtains will be raised or lowered by electricity.

The object of the new big plant is to inaugurate what will be known as "chats about French Canada for French Canadians," and, to reach them whether in static belts or dead zones. Throughout the provinces of Quebec, Ontario, Nova Scotia and New Brunswick, there are today some two and a half millions of French Canadians, and over two million others are scattered through New England states, Michigan, Louisiana, etc.

## Hoover Promises Air Conference in June

### Parley Will Be Held Despite Action of Congress

WASHINGTON, D. C.—No definite date has been set by Secretary of Commerce Hoover for the third Radio conference which will be held in June. The secretary has announced that the conference will be held regardless whether or not Congress passes any Radio regulatory legislation at the present session which seems doubtful at this writing.

Details for the forthcoming conference have not yet been completed.

### Walter Wilson, KYW

Did you notice the little kid last week with his legs crossed and the devil's terrified look on his face? Well, that was Walter Wilson, the announcer that all the children like to hear.

He was born in Chicago, in the Ravenswood district about 42 years ago. Then a few years later, of course, the neighborhood was so wild that Bob used to shoot rabbits from his bedroom window. He weighs 285 pounds ringside, and every pound is made up of good nature. The children suggested that he try to reduce, but after some experimentation he surrendered as unable to do so.

The reporter who interviewed Mr. Wilson, or as he is more often called, "Uncle Bob," asked him to give a synopsis of his dark and shady past. Here it is: Eyes: Baby blue; hair: When it's clean it's black-brown, and plenty of it; servitude: Married, very much so; hobby: Pinocle and golf—19-hole golf; experience: Been in the music publishing business for twenty years, used to be a warbler in the five and ten cent stores; ambition: His one and only is to be a pal to the kiddies; aversion: Cucumbers—he agrees with them but they don't agree with him; gifts from fans: oodles 'n' oodles of homemade fudge, lamp shades (he's so bright), etc.

His creed as an announcer and bedtime story teller is simple. He says, "A man must believe in himself, otherwise how can anyone believe in him."

Mr. Wilson is the well-known story teller at Station KYW and also the famous singer of "Dream Daddy." What is more he's going to sing a brand new song soon, written by himself just for the kiddies. It's called "Uncle Bob."

## CINCINNATI'S 3RD STATION ON AIR

### 8XBV Opens in Alms Hotel and Work Begins on New Home for WLW

CINCINNATI, O.—Cincinnati's third large broadcast station was to be on the air this week. Designated by its temporary call letters 8XBV, the new station located in the Hotel Alms, has been broadcasting test programs nightly, after midnight, during the past ten days.

A division of time was partially agreed upon at a recent conference between the representatives of the three stations, the Alms being allotted an early evening period on Wednesday evenings and the hours from 10 to 12 on Saturday and Sunday evenings. Additional time divisions will be arranged.

As the Almsworth-Gates Radio company opens its Hotel Alms station, the Crosley Radio corporation begins the erection of its new station and studio on a site some distance further from Cincinnati's downtown district than its present location. WLW will be equipped with new apparatus throughout. Plans for the studio provide glass partitions separating the reception room from the broadcasting and operating rooms, affording visitors unobstructed view of broadcasting activities.

Book publishers estimate that nearly three hundred books on Radio have been published in the past two years.

### Edwin L. Tyson, WWJ

BORN in the town of Tyrone, Pennsylvania, Edwin L. Tyson decided that he would like to be a captain of finance or industry, so he entered the business field.

When war broke out, he was given the job of teaching the rookies the differences between "hay-foot" and "straw-foot." While on this job he exercised his lungs to such an extent that when war was over, he thought that he would ease in on the exercise he gained—so, he became an announcer.

Mr. Tyson is a stickler for correct pronunciation, claiming that the Radiophans pay more attention to an announcer's voice than they do to the grammar in the newspapers.

Station WWJ has two announcers so that Mr. Tyson has a pretty soft time at that. He only does half the work, while his colleague does the other half. Their voices are identical and even Mr. Tyson's wife (oh yes! he's married) is unable to differentiate between her hubby's voice and the voice of his side-kick, which of course has a lot of advantages for Edwin when he isn't where he ought to be.

But after all is said and done, Edward L. Tyson is one regular fellow, and whenever you are listening in to WWJ the chances are that you will hear his voice. Try and identify it. That's all.

## WENDELL HALL TO WED BY AIRPHONE

### Ceremony for "Ain't Gonna Rain" Man and Bride to Be Re-broadcast

CHICAGO.—Radiophans tune in for one of the big stations June 4. Wendell Hall, the man who sings "It Ain't Gonna Rain No Mo'." is going to be married by Radio to "The Little Girl in Chi." The ceremony is to be performed at Station WBAF and will be re-broadcast through Stations WJAR, WCAP and a Chicago station.

Mr. Hall, in relating his experiences, finds that his Radio publicity helps him in the sale of his thirty-three compositions now in print, and the nine Victor records of same which are now on the market. He is now in Chicago, dividing his two weeks' appearances among seven different stations.

## WQJ MAKES DEBUT AS DANCERS WATCH

### FEATURES FOR WOMEN TO GO ON CHICAGO PLANT

#### Rainbo Gardens and Calumet Baking Powder Company Open New Station on 448 Meters

CHICAGO.—With a display of splendor and a maize of flashing colors, Station WQJ, owned jointly by the Calumet Baking Powder company and the Rainbo Gardens here, opened recently with a gala night and an array of excellent talent.

The station is located on the mezzanine floor, on the west wing, of the million dollar Rainbo Gardens. A large plate glass on the ballroom side enables the diners and guests to watch the actual broadcasting without in the least disturbing the artists.

#### Schedule and Program Plans

All programs will be broadcast on a 448-meter wave length, the same as used by Station WMAQ here. To avoid interference, both broadcasters have made an agreement dividing their hours of operation.

The programs are to include talks to encourage housewives to buy at home and educating them to appreciate the standard of goods sold by local dealers.

There will also be hours, during which it is proposed to have some of the country's best style authorities describe the latest in wearing apparel, home decoration, etc.

#### Home Management Subjects

Helen Harrington Downing, head of the Home Economics department of the Calumet company, and other nationally known women will broadcast regularly on efficient home management.

Jerry Sullivan, musician, singer and song writer favorably known in Radio and music circles, is director of WQJ, while Phil Schwartz, better known as Uncle Phil, will be his assistant. R. J. Engler, recently of Station WOS, Jefferson City, has been recruited as engineer in charge of the station's equipment. His excellent record at the "Watch Our State" broadcaster caused his selection for the new position.

## NOMINATION CERTIFICATE

### Announcers' Contest

Radio Digest First Annual GOLD CUP AWARD

GOLD CUP AWARD Editor, Radio Digest, 510 N. Dearborn St., Chicago, Ill.

Dear Sir:

I nominate .....

Station .....

Broadcasting Station

Signed .....

Address .....

Town .....

State .....

# WHITE REPORTS OUT BILL; KNOCKS TRUST

WOULD HAVE ALL ADVERTISING "LABELED"

Representative from Maine Pushes Radio Legislation—Puts Anti-Monopoly Clause in Proposed Law

WASHINGTON, D. C.—Representative White of Maine in reporting out his Radio bill from the House committee on merchant marine and fisheries, does not mince matters when he takes up the question of monopoly. He has also included in his report some interesting views of the whole Radio situation. In discussing the question of interference he says: "There has been much public discussion of the interference caused by receiving sets and many requests that legislation should be framed to prevent the use of receiving sets which radiate energy; but we do not recommend any control of receiving apparatus."

### Takes Rap at Radio Trust

It is pointed out in the report, that there have been general complaints throughout the country that certain companies engaged in the manufacture of vacuum tubes and Radio sets and their parts, have been guilty of maintaining prices at unreasonable levels, of improperly restricting the use of instruments and their parts by competitors and the public, and of other practices prejudicial to the free development of the art and to the public interest. In this connection the committee in its report says:

"These ends have been obtained by various and devious means asserted by the companies to be legal, challenged as to their lawfulness by others, but felt by your committee, to be against public policy, whatever the law may now be as to them. Various sections and paragraphs of the bill are efforts to meet these and other conditions which your committee believes should be corrected."

### Other Advertising Considered

In connection with advertising by means of broadcast stations, the committee says: "One of the subjects of public discussion at the present time is the extent to which broadcasting stations should be utilized for advertising purposes. Your committee has not felt justified in forbidding or undertaking to limit advertising through this medium but we are unanimous in the opinion that much the

# STOPS HOWLS USING "BIRDIE" ELIMINATOR



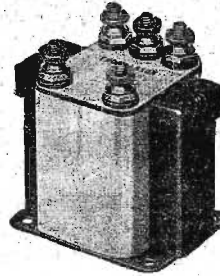
Above photo shows Paul Edelman, Radio engineer and author of a series of beginners' articles appearing in Radio Digest, who has made a device which he used to mitigate troublesome howls created by neighboring oscillating sets.

same rule should apply to this form of advertising as applies to newspaper advertising.

"It should not be hidden from the knowledge of the hearer. Section 6 of the bill, accordingly requires that all matter broadcast for which any money or other valuable consideration is paid shall be announced as advertising at the time the same is broadcast. The section contains a provision that when the advertising or publicity consists solely of the announcement of the name and business of the person paying for the feature broadcast, it shall be sufficiently to announce 'paid for' or is 'furnished by' such person."

The bill's discussion of Radio advertising is interesting because it is practically the first official recognition of this problem.

# THORDARSON



## POWER AMPLIFYING TRANSFORMERS

Price per pair, \$13.00

The new Thordarson Power Amplifying Transformers (push pull) are designed for use as third stage audio frequency amplifiers, to provide high power amplification for operating loud speaking devices.

With power amplification, not only is it possible to increase volume, but, since two tubes replace the usual one, the distortion and howling which usually accompany the overloading of a single tube on the third stage is done away with entirely.

The Thordarson Power Amplifying Transformers are well constructed electrically and are capable of indefinitely carrying the additional load without breaking down.

In total purity these transformers equal the Thordarson Super Audio Frequency transformer whose rich quality and even amplification has made it the popular transformer of the day.

# THORDARSON

ELECT. MFG. CO. CHICAGO  
500 W. Huron St.



## New Crosley Engineering Achievement

Four and Five Tube Results with Three Tube Receiver

For over a year, the Crosley Engineering Department has been working on a new circuit. This has now been perfected into an unusual radio receiving set—a triumph in radio engineering.

This remarkable set is equipped with two condenser dials, two rheostats and a slide tapper. It uses three tubes; one stage of non-radiating radio frequency amplification, regenerative detector with perfectly stabilized control of regeneration from which the signal goes back to the first tube, using that tube over again for one stage of audio frequency amplification and then traveling into the third tube, an additional stage of audio frequency.

From this combination of three "Ts"—Radio Frequency Amplification, Regeneration and Retter—we have coined the name Tri-R-Dyn, which will be written Tri-Dyn.

### Advantages Never Before Offered

The advantages resulting from this successful circuit have, to our knowledge, never before been offered. Regeneration is reduced to an absolute minimum, the signal is intensified before it goes to the detector, thus giving the detector an unusually strong signal upon which to function, and the dial can positively be calibrated to any wave length between 200 and 600 meters. With only two dials, the most inexperienced person can pick up station after station, without calibration and without difficulty, bringing stations in volume equal to any four or five tube set on the market. See this latest Crosley achievement at your dealers or write for further complete information concerning it.

For Sale by Good Dealers Everywhere

## The Crosley Radio Corporation

Powell Crosley, Jr., President

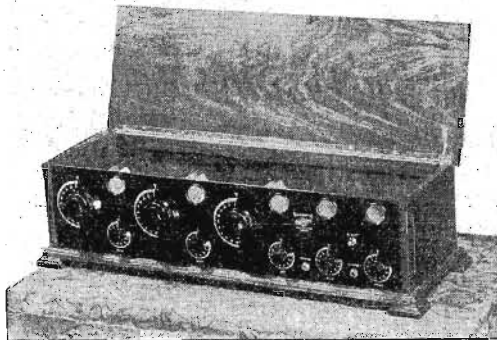
Formerly

THE PRECISION EQUIPMENT CO.

AND CROSLY MANUFACTURING CO.

5495 Alfred St.

Cincinnati, Ohio



## The Howard 5-Tube Neutrodyne Coast to Coast Range

Beautiful black walnut cabinet with special designed Howard Neutroformers, Neutrodones, special sockets and rheostats.

The Howard Neutrodyne brings the wonders of radio into your home and allows you to distinctly receive the famous broadcasting stations of the world.

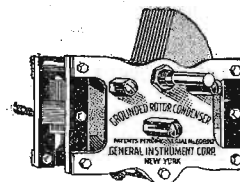
WRITE TODAY FOR DESCRIPTIVE FOLDER OF THIS REMARKABLE SET

Howard Mfg. Co. is one of the few manufacturers licensed under Hazeltine patents to sell Neutrodyne receivers.

HOWARD MANUFACTURING COMPANY  
4246 NORTH WESTERN AVENUE  
CHICAGO



## PROVED BY LABORATORY TESTS THE LOW LOSS GENERAL INSTRUMENT CORPORATION GROUNDED ROTOR CONDENSER



### THE LOWEST LOSS CONDENSER

That explains why nationally known manufacturers of radio sets have accepted and contracted for these condensers to be used as their

### STANDARD EQUIPMENT

Here are excerpts from two of the many letters received from our manufacturing customers:

"Since using your GROUNDED ROTOR CONDENSERS, we believe we will surprise the public next season not only with the best looking but also with the best operating receiving set on the market."

### Another accompanies his order with the following:

"Your readings check up perfectly—your condenser improves the quality of reception to a remarkable degree. We hope the uniformity of your first shipment will always be continued."

Type	Minimum	Maximum	Price
Type 46X 11 Plate	5 MMFD.	.00025 MFD.	\$4.50
Type 46A 13 Plate	8 MMFD.	.0003 MFD.	4.50
Type 46D 21 Plate	9 MMFD.	.0005 MFD.	5.00
Type 46F 43 Plate	15 MMFD.	.001 MFD.	5.50

AT YOUR DEALER

Otherwise send purchase price direct to us and you will be supplied.

## GENERAL INSTRUMENT CORP.

423 Broome Street  
NEW YORK CITY



# OPERATING AND TROUBLE SHOOTING

## For the Owner of a Crosley No. 51 Receiver

**O**PERATING and Trouble Shooting" is a Radio Digest feature whose purpose is to study the late models of various standard receiving sets and to show the newly initiated broadcast listener, who has purchased such a set, how he can operate it to get the best there is in it and how he can overcome minor difficulties which may be causing some trouble. On pages 7 and 8 this week the Crosley No. 51 Receiver is described. Radiophans with other sets will also find these articles worth while reading, particularly the notes on trouble finding.

**T**HE Crosley Model 51 portable is a two-tube regenerative receiver. It comprises a single circuit tuner, with controls for a vacuum tube detector, having a tickler in the plate circuit. This tickler makes the set regenerative. It also contains a one-stage audio frequency amplifier with transformer coupling.

The additional equipment required is: grid leak, if desired; two vacuum tubes; A battery; B battery; C battery, if desired; head phones; antenna and ground.

### Grid Leak

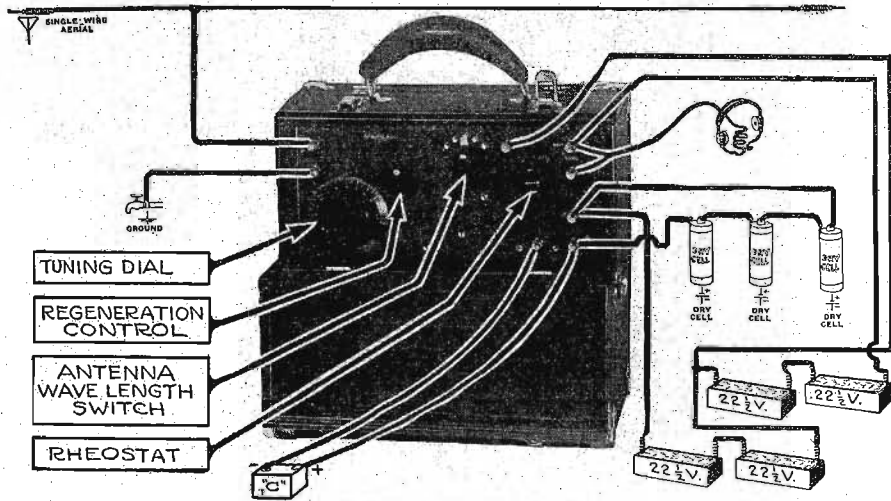
Some manufacturers of vacuum tubes recommend the use of a grid leak. In some cases better results are obtained with the grid leak, but its use is not essential and at times is even detrimental. Spring clips on the grid condenser are provided to hold a tubular or cartridge leak. In the following paragraphs describing hook-ups for various tube combinations, you will note statement regarding use of grid leak. It is recommended that you try your set with and without grid leaks.

### Vacuum Tubes

This portable set is equipped with a universal rheostat, which makes it possible to use any of the vacuum tubes now available.

The portable model is designed primarily for dry cell tubes, and a battery cabinet is provided of sufficient size to hold three standard 6-inch dry cells and three small size 22½-volt B batteries or the equivalent, thus providing for an ample power plant for continuous use over a reasonably long period of time with the popular dry cell vacuum tubes. These small size 22½-volt B batteries vary in size. Should difficulty be experienced in inserting three B batteries in the battery cabinet, we suggest that you use only two 22½-volt B batteries, or, should you desire 67½ volts, insert a third B battery in the right hand compartment which is designed to hold the headphones.

For convenience in making connections when the batteries are placed in the battery cabinet, flexible wires will be found in the battery cabinet, each wire having



a tag indicating the correct connection. If WD-12 tubes are to be used, connect the wire marked A to the minus or negative terminal of one of the dry cells. The negative terminal of a Number 6 dry cell is the outside binding post. For WD-12 tubes the dry cells should be connected in parallel, that is, all the outside binding posts of the dry cells should be connected together and all the center binding posts should be connected together. Make the other connections as indicated and notice that the wire marked B- and A+ must be connected to both the center post of one of the dry cells and to the minus terminal of the first B battery. The B batteries must be connected in series. If you use the wire marked B 45+ to the positive terminal of the last battery.

For UV-199 tubes make the same connections except that the three dry cells are arranged in series, that is, the positive or center post of one dry cell is connected to the negative or outside post of the next dry cell.

If a C battery is not used the flexible wire marked C must be connected to the A binding post.

The Crosley 51 portable set is not designed to be operated in connection with a loop antenna. An outdoor antenna is necessary. The better the antenna the better the results. However, remarkable work may be done on a small antenna; for example, in a hotel a wire may be run across the room or around the picture molding, or a length of wire may be hung out of the window, provided the wire does not come in contact with other wires. When camping, the antenna may be tied at one end to a tree and the other end may be brought directly to the receiver. The ground connection is very important.—a first class ground may be often secured even on a temporary set up—make sure you have a good ground connection.

### Head Phones

A pair of sensitive head phones is required. These are connected to the upper right hand binding posts on the front of the panel. On local stations, or on powerful distant stations, a loud speaker may sometimes be used. Loud volume cannot

be expected. Connect the loud speaker to the output binding posts.

**ANTENNA CONDENSER**—This unit is controlled by the large knob and dial on the left hand side of the panel.

**ANTENNA INDUCTANCE**—This is varied by the tap switch in the top center of the panel.

**VARIOCOUPLER**—The plate inductance element of the variocoupler, or the tickler, is controlled by pulling out and pushing in the small knob to the left of the tap switch, and to the right of the large condenser knob and dial.

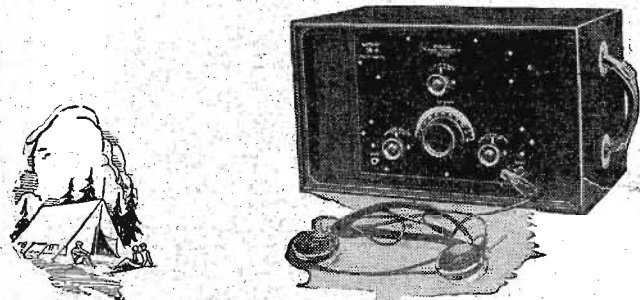
**DETECTOR TUBE**—The detector tube is placed in the socket on the left hand side of the set as you face it from the front. The amplifier tube is placed in the right hand socket. Both of these tubes are controlled by the same rheostat, which is operated by the knob on the right hand

side of the panel. Turning this knob toward the right turns on the filament current. Turning it to the extreme left shuts off the current completely. When the set is not in use the knob should be turned to the extreme left so that the battery will not be consumed unnecessarily.

### Operation

Check all connections carefully. Turn off rheostat by rotating the knob toward the left until the contact arm is not touching the resistance winding. Place tube in socket according to above directions. Turn on the rheostat, being careful not to turn it too high. Follow the directions given for the various types of tubes. Connect head phones to the two upper right hand binding posts on the front of the panel.

(Continued on page 8)



## Federal No. 102 Special Set is "CONVERTIBLE"

"CONVERTIBLE" is the only word that even nearly describes the Federal No. 102 Special Receiver. It is a complete "portable" set, with dry batteries, head phones, etc., ready for immediate camp or road use,—PLUS the capacity for quick and easy changing to wet battery for city or country "home" use. True to Federal Standards, the No. 102 Special incorporates exceptional tone beauty, selectivity and distance range. Federal flexibility pervades throughout,—the No. 102 Special will operate perfectly on any tube interchangeably.

Ask any Federal dealer for a demonstration of the Federal No. 102 Special Set

FEDERAL TELEPHONE & TELEGRAPH CO.

Buffalo, N. Y.



# Federal

Standard RADIO Products

Boston, New York, Philadelphia, Chicago, Pittsburgh  
San Francisco, Bridgeburg, Canada, London, England.



Look for this sign



Use  
De Forest  
Audions

DE FOREST RADIO TEL. & TEL. CO., Dept. R.D.3, Jersey City, N. J.

AN EVENING AT HOME WITH THE LISTENER IN

(SEE INSTRUCTIONS FOR USE BELOW)

Table with columns: Station and City, Met., Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday. Lists broadcast schedules for various stations across the country.

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. In addition, your city uses daylight saving time, add one hour to this result. This table includes only the evening broadcasts, 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, Meters Call. Lists station call letters and their corresponding wave lengths.

more carefully and bring in this sound as loud as possible. You should now hear the station.

Check antenna and ground connections carefully. The antenna must be carefully insulated from any grounded object.

Adjust the vario-coupler by pulling out or pushing in the controlling knob until the signal is perfectly clear and loud.

Test head phones by using on a receiver known to be operating properly. If this is not possible, place phone tips across the terminals of the A battery, one on the negative and one on the positive. A decided click should be heard when this is done. Connect only momentarily.

Adjust the filaments of the tubes by turning the rheostat knob on the right of the panel. A very slight adjustment of the filament often aids greatly in clearing up the received signal.

Remember that it requires some skill to tune a set with which you are not acquainted.

Use other taps of the tap switch and re-tune for different wave lengths. The wave length of the set is increased as the tap switch is moved from the left to the right.

"How to Operate and Find Trouble" next issue will be devoted to the Collin H. Kennedy portable receiver. Coming with the outdoor season the article will be appreciated by owners of Kennedy and other makes of portable sets.—Editor's Note.)

In Case of Failure to Operate. Be sure a broadcasting station is operating within the range of the receiver.

Be sure a broadcasting station is operating within the range of the receiver.

Advertisement for Myers Tubes. Features a large image of a tube, the text '30 STATIONS In One Hour!', and 'Myers Tubes'. Includes details about performance and pricing.

OPERATION, TROUBLES

(Continued from page 7) Place the tap switch on the fourth tap from the left. Turn the large knob and dial in the left hand with the tickler knob pulled forward about a quarter of an inch; turn the large knob slowly from 0 to 100. The large knob and dial, together with the tap switch, control the wave length of the antenna circuit. It is necessary to tune the antenna circuit to the wave length of the transmitting station whose reception is desired. The signal is indicated by a squealing or whistling sound in the head phones. Tune

Advertisement for ELGIN SUPER-REINARTZ. Text: '2-LO, LONDON, ENGLAND ON ONE TUBE Another Record for the ELGIN SUPER-REINARTZ'.

Advertisement for Coto-Coil Co. Text: 'Coto "Built First to Last" Stop the Leaks! Save all the energy in the antenna for your detector tube. This Coto Compact Air Condenser with Varmer is so perfectly insulated that losses are reduced to a minimum. Plates are of silver plated copper soldered in place for lasting adjustment.' Includes images of the product and pricing.

Advertisement for ELGIN RADIO SUPPLY CO. Text: 'Officially Confirmed by the St. Louis Post Dispatch in conjunction with the National Association of Broadcasters... ELGIN RADIO SUPPLY CO. 207 Chicago St. ELGIN, ILL.' Includes details about the product and company information.



# 30 Minute A-B-C Lessons for Radio Beginners

## Chapter XI—The Shorthand of Radio Diagram Reading

By P. E. Edelman

IN THIS series of articles the story of Radio is told in so simple a manner that the uninitiated can follow theory and practice whether he knows anything about electricity or its application to broadcasting and reception or not. The series consists of twenty-five chapters, of which the five next will be: Chapter XII—Catching Radio Waves, Chapter XIII—The Radio Detective, Chapter XIV—Tuning In, Chapter XV—Working Through Interference, Chapter XVI—The Power Voice of Radio.

BY SHORTHAND of Radio, the picture representations of diagrams is meant. There is another Radio shorthand concerned with language, and the usual

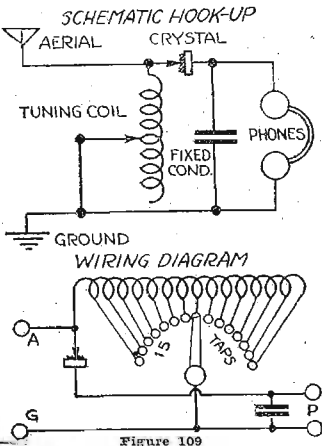


Figure 109

Radio telegraph message will be transmitted as a series of special abbreviations. The diagram represents of apparatus parts and their typical appearance is

<b>FEED BACK</b> (Specified size)	<b>DYNAMO OR MOTOR</b> (Direct current)	<b>TELEPHONES</b>
<b>200 MH. COIL</b> (Specified size)	<b>GENERATOR OR MOTOR</b> (Alternating current)	<b>MICROPHONE</b>
<b>GROUND</b> (Clamp)	<b>CHOKO COIL</b> (Iron core)	<b>RESISTANCE</b> (Non-inductive)
<b>TRANSFORMER</b> (Iron core)	<b>POTENTIOMETER</b>	<b>COIL</b> (Inductance adjustable)
<b>COUPLER OR TRANSFORMER</b> (Fixed, air core)	<b>RHEOSTAT</b>	<b>COIL</b> (Inductance fixed)
	<b>CRYSTAL DETECTOR</b>	<b>PLUG</b>

<b>VARIOMETER</b>	
<b>SPLIT VARIOMETER</b>	
<b>COUPLING (Adjustable)</b>	

shown in the accompanying figures. Sometimes diagrams are shown with pictured parts, but it is then difficult to follow

### RADIO HANDBOOK



Only \$1  
514 PAGES

Just off the press! The greatest book on Radio ever written. Price only \$1. Filled with sound, practical, tested information for every radio fan, from beginner to hard-boiled owl. Written, compiled, and edited by men of national reputation. Every page tells you something useful—and there are 514 pages. Mail \$1 to-day and get this I. C. S. Radio Handbook before you spend another cent on parts. **Money back if not satisfied**

TEAR OUT HERE  
INTERNATIONAL CORRESPONDENCE SCHOOLS  
Box 5276-L, Scranton, Penna.  
I enclose One Dollar. Please send me—**immediately**—the 514-page I. C. S. Radio Handbook. It is understood that if I am not entirely satisfied I may return this book within five days and you will refund my money.

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

the connections, as location of binding posts are not usually related to the function of the part connected. Consider a vacuum tube. The best photographic il-

lustration fails to show the connections to be made as clearly as the diagram symbol.

In Figure 109, a simple receiving set

circuit is shown in two forms, one diagrammatic, and the other schematic. (Continued on page 10)

## Thrills from Radio

No. 20 of a Series Featuring Experiences of "ALL-AMERICAN" Users

### "I Got Honolulu from St. Paul with All-Americans"

By Meyer Tankenoff, St. Paul, Minn.

"For long distance results you don't want anything better than All-American Transformers. Am using some in my three-tube single-circuit Armstrong design set and they work fine.

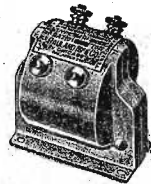
"Here is what All-Americans do. Am only going to give you the long distance stations. (Of course I get everything in the U. S. and Canada.)

"On January 17, 1924, 1:30 A.M. Cen-

tral Time, I got Station KGU Honolulu—a distance of about 4,000 miles from St. Paul. It came in very clear.

"So you see what transformers will do when you get good ones. Others may fail, but not ALL-AMERICAN! You are right."

Satisfied users of All-Americans, now numbering over three-quarters of a million, have made them the largest selling and most popular transformers in the world. Buy All-Americans, know you're getting the best—and save money!



All-American Audio Frequency Transformers come in three models: \$1, \$4.50; 5:1, 10:1, \$1.75. The best—no necessity to pay more.

All the better dealers sell the "ALL-AMERICAN"

RAULAND MFG. CO., 2640 Coyne St., CHICAGO.  
PIONEERS IN THE INDUSTRY

Audio and Radio Frequency; Power Amplifying (input and output)



Over three-quarter million in use. Standard on the better sets

**ALL-AMERICAN**  
AMPLIFYING TRANSFORMERS  
Largest Selling Transformers in the World



It's Capacity that Counts!

Good condensers are designed according to microfarads, not number of plates alone. U. S. Tool Condensers are designed for correct capacity.

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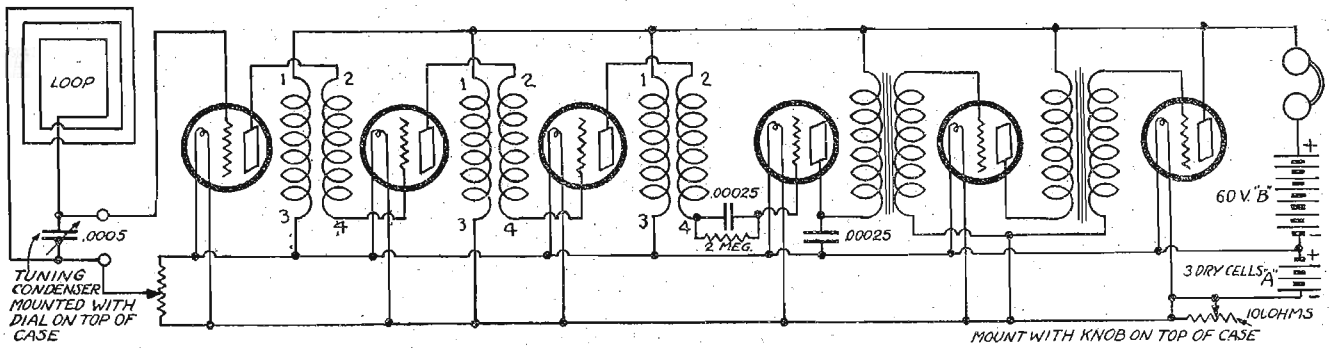




# How to Make a Talking and Singing Suitcase

## Part II—Constructing Case and Assembling Set

By S. R. Winters



IMPROVEMENTS and refinements in the electron tube, the heart of Radio, have made possible the multitude of compact, portable radio-telephone receiving outfits of today. The self-contained set in a suitcase is no exception to the rule. From the first attempts of the Radio Laboratory of the Bureau of Standards, during the summer of 1921, to develop this type of portable equipment until the talking and singing suitcase was recently perfected and standardized the use of particular types of electron or vacuum tubes, deriving their electric energy from dry cell batteries, have been necessary.

As now constituted, this Radio-telephone receiving set in a suitcase uses six UV-199 tubes—three stages of Radio frequency, two of audio frequency and a detector. The UV-199 tube requires a minimum of energy for lighting the filament—the infinitesimal amount of .18 of a watt. The small size of this electron tube as well as its base and socket, are qualifications which makes it desirable where compact formation is an object. Due to the small size of the UV-199, the capacity between the electrodes is probably lower than that of any other vacuum tube recently developed. Similarly, by reason of the small electrical capacity between the electrodes, it is desirable in Radio circuits employing Radio frequency amplification. Moreover the UV-199 does not require critical adjustment of the plate voltage, and

ing in an automobile passing over trolley or railway tracks.

Three Radio frequency transformers are employed in the talking and singing suitcase. The audio frequency transformers should have a low ratio between the windings.

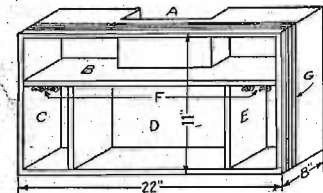
**Design of Transformer**  
An efficient design of Radio frequency transformer is said to be essential to the successful operation of the talking and singing suitcase. The use of a coil or loop antenna in such close proximity to the amplifying circuit is liable to produce trouble by reason of inter-action or play of inductance if the type of transformer is poorly designed. Efficient transformers will insure a stable arrangement and one productive of efficiency.

In the construction of Radio frequency amplifiers, the same circuit as the commonly used audio frequency circuit may be used, with the addition of a stabilizer

rheostat. By adjusting this stabilizer extreme sensitivity is obtained, thus avoiding the necessity for regenerative tuning. The tuning controls are reduced to a minimum, thus contributing to the simplicity of operation. For instance, when using five or six UV-199 tubes in this suitcase Radio receiving set only one 10-ohm rheostat, placed on top of the suitcase, and in series with the A battery, is necessary. The adjustment of the temperatures of the filament element of this type of electron tube is not critical, hence the simplicity of control. It, however, separate rheostats are employed they should be placed in the negative A battery leads.

**Loop Antenna Used**  
The coil or loop antenna, which, together with the other integral instruments essential to a complete wireless receiving unit is enclosed in a common suitcase, consists of 13 turns of wire, which is spaced 1/4-inch apart. The strands

of the wire are threaded around a wooden frame, which is placed in one end of the leather container. Of course, a loop antenna of larger dimensions would increase the effective range in the reception of speech and music but would likewise call for an enlargement of the leather container and thereby contribute to the weight of the portable outfit. Moreover, an external aerial or overhead antenna would increase the receptive range of this (Continued on page 20)



tapped plate batteries are not essential, irrespective of whether this electron tube is employed as a detector or amplifying unit.

### Proper Tube to Use

Unless the virtues apparent in UV-199 are sought, the builder of this type of portable Radio telephone receiving unit is liable to encounter difficulties. For instance, the owner of the particular model of talking and singing suitcase described in this article has observed the tendency of a certain amount of interaction or inductance at play due to the close contact of the loop antenna and the amplifying circuit when bound up in a case of leather only 11 by 22 by 8 inches in dimensions. This adverse tendency can only be avoided by the use of a type of electron tube not easily susceptible to howling or given to uncontrollable oscillation. For these reasons, the WD-12 tubes were discarded in favor of the UV-199. The former design of vacuum tube, according to practical tests, appeared to be unstable in position and was otherwise troublesome by reason of the microphonic noises imparted. The use of sponge-rubber mountings as a stabilizing element did not counteract this difficulty.

On the other hand, the use of the UV-199 makes this untoward condition controllable. If microphonic noises are imparted when employing this type of vacuum tube, the trouble seems to center about the detector unit. In this case the annoyance can be surmounted by a switching of the tubes in their positions—from detector to amplifying unit sockets, and vice versa. The use of the UV-199 does not require flexible tube mountings, since the sockets may be placed rigidly without imparting microphonic noises, even when the outfit sustained severe

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## Year-Around Radio

Not an Indoor or Winter Game

THE summer now here will strikingly demonstrate that Radio is not simply an indoor game, nor its use confined to the winter time. On every hand—among manufacturers, among persons who already have sets, and among prospective buyers of sets—are indications that Radio will be as popular during the summer months as during other parts of the year. In fact, year-around Radio has arrived.

Perhaps the most important factor contributing to this result is that for the first time portable sets which are really portable sets will be available. Since last summer a great advance in the Radio art has been brought about by the use of Radio frequency transformers, and by the development of reflex circuits. The owner of a Radio set who has enjoyed it so much indoors during the winter would not be content without it in the coming months of outdoor life. This year he can gratify his wish with a portable set.

Last year, to be sure, many sets were called portable, simply because it was possible to cart them from place to place. But there was always the problem of where to put up the aerial, and how to make ground connections. With the advent of the loop antenna, with which the reflex circuits operate, these two problems are solved, and it may be truthfully said that such sets are portable.

A four-tube set may be had with the A and B batteries inside of the cabinet and the loop fastened on the side. Such sets may not only be transported conveniently on a journey by rail, steamship or by motor, but they may be taken in a rowboat or canoe, set up in camp or carried on a picnic.

The year-around Radio will mark another step in the development of an art which is so profoundly affecting the American life.

## Summer Radio

Broadcasting Will Not Lessen in Activity

THERE is no indication that broadcasting stations will lessen their activities during the summer. Two great political parties will nominate candidates for the presidency and vice presidency. High spots in the campaign and the convention will be broadcast.

Portable sets that use dry batteries have solved the problem for the summer vacationist. It is a very easy matter to put a Radio set in an automobile, summer camp, or along some stream or lake.

Think of lying out under the stars or sitting on the veranda of your summer cottage listening to the latest baseball scores, the strains of some orchestra or band broadcasting from a city far away.

If you stay in the city during the summer why not use Radio and the loud speaker to stage a nice little dance out in the open or in the parlor. If you have enjoyed Radio during the past winter, why not enjoy it equally as well this summer?

## Voice and Acting

Theatrical Productions Yet May Be Broadcast

THE appeal of singing, acting and other theatricals is two ways—by the eye and by the ear. When there is an intellectual as well as an emotional appeal there is apt to be a scant audience.

The appeal to the eye is several times more fascinating than the appeal to the ear. This has been demonstrated by the success of the silent form of entertainment, movies, though even in this field the effect is enriched by skillful orchestral aid.

But Radio, now appealing directly to the ear, faces a more difficult problem. Radio will not be allround satisfactory until the Radio bug is able to see as well as hear the entertainers.

The inventors are hot on the trail now. It probably will not be long until the Radio bug will have an attachment by which he will see what he hears. Radio has eliminated space as far as hearing is concerned, and the chances are that it will also eliminate distance in the matter of eyesight.

## RADIO INDI-GEST



### She Married a Radio Fiend

By Simply Waddles

HIS words with love were laden when he promised to be true. She was a flapper maiden, he a drugstore cowboy, too. With ring upon her slender hand they to the church did go, and everything went simply grand till he got his Radio—

Now she sits all by her lonesome trying hard not to feel blue, thinking of her rival—a box just six by two. His loving words no more she hears, for every hour he's home he tolls with gaze upon the dials and receivers on his dome.

Oh, there's solder in the sofa and there's wire upon the floor, batteries on the table and still he's buying more. She dare not make the slightest noise. The chandelier's a ground. The bedspring is a counterpoise. There's no place to sit down.

The rolling pin is useless for he's wound it full of wire. His head is full of hook-ups and his temper full of ire. The home with Radio parts is strewn, there's Radio everywhere. He might as well be made of wood for all he knows she's there. He's forgotten how to kiss her. He's surely going bugs. His beauty's hid 'neath whiskers. There's acid on the rugs. He won't eat or sleep or anything. His hair he never combs, and cuts it only round the ears to make a place for phones.

But while the fiend was tuning in it chanced to her one day, that another love came stealing in and took her heart away. Yet with the new one in her arms she sometimes feels quite sad, and fears that he may grow to be a nut just like his dad.



### Add Bony, Fony, Mony, Pony, and Tony

Dear Old Thing: If New Yawk can't get CONY (City of New York) for call letters, why not KONY?  
DIT-DAH DIT-DAH.

### Speaking of Needed Inventions

For the Next War

Home broadcasting for buddies unavoidably detained in shell holes (not including Willie Warthing and Polly Polcott stories, weather reports from WEAK contradicting those from QUOP, Acrobatics by Correspondence, or Miss Geronimo Weasel on "The Economics of Tattling.")  
American Legion Weekly.

### He Wants SOFT Falls, Not SOS Calls

Dear Indi: Must tell you about my wonderful set. It's so good I bring in QRM with no trouble at all. I junked my 27-tube contraption for 40c and made this set. The Prince of Wales paid me a visit on February 30 and said he was going to install the same kind of sets on all the battleships in the Swiss Navy, and keep one with him when he goes horseback riding so he can pick up SOS calls. ELBECROX.

### Ah! You Musn't Listen to Yourself

Dear Indi: I asked a lawyer feller what right these sassy copyright fellows had to want the broadcasters to pay them for letting people hear music that they wanted to and he told me a lot of big words like Mr. McDonald gets Dr. McWhorter to tell to Capt. MacMillan, and I could not get anything out of his talk and he told him to say it plane-like and he said it was this-away:

They want people to buy their music and pay them again if they play or sing it. And I said alint there some way around that and he said sure just buy some of their music and go down in a submarine all by yourself and you can play or sing it all you want to.

Well that would be purty hard on a feller like me that is hard of hearing and can't sing loud enough to hear it myself.  
INS U. LATTON.

### Mrs. Partington Speaks Out

Dear Indi: Mrs. Partington says; She's right glad she can't get Radio deception by daylight, as she is kep so busy now with a college course at WPAB, Farm Course at WTG, Music lessons at WEZ, Political Un-economy at WRC. World News Crying every thirty minutes at KYW. Radiowis at WSB. Nighthawks at WDAF, Morning Glories at WDAE, the Circus at WTAS, helping the Hired Hand at WBAP, tune his boilers and the Truth, having to listen right often over the backyard fence to her local station, KDKA, only 225 miles away, going to two or three kinds of churches and listening to Roxie and his gang on Sunday, with lots of other good listening. She would like to be done, she is about fit for a course of the Radio Dealers Musical program: 6:30-7:30. KFAF, Denver, CO; 7:30-8:00. KFAF, Denver, CO; 8:00-8:30. KFAF, Denver, CO; 8:30-9:00. KFAF, Denver, CO; 9:00-10:00. concert, Melody Music.



## Another Hand Out



## Condensed

By DIELECTRIC

A new station will shortly be built by the General Electric Company in Schenectady to be used for experimental purposes. The station, now in use, WGY, was originally intended to be devoted to experiments in Radiophony, but regular programs soon consumed all of the available time. With the new construction of antennas and a power house capable of delivering high power at various frequencies, it is thought much of great value to broadcasting will be discovered. The use of high frequencies seems to be gaining favor where distance is concerned.

That Radio Fund Roxie started is fast growing into a sizeable amount. You remember he took "the gang" to Washington to entertain the buddies down there, those crippled veterans, and the idea struck him to raise money for purchasing receiving sets for the fellows. Many of our listeners probably hear Roxie Sunday evenings joyfully report progress. Let's all have a hand in this thing. Listening in may be a treat now, but, if we give our bit, it will surely add to our joy. Here's a thought for each of you: An ex-service contributor wrote: "I want to feel that one of the boys can be listening in with me as my invisible guest." Come on now, each of us provide "guests" at the Radio feast!

It has been proved possible to receive Radio signals transmitted from powerful broadcasting stations several hundred feet below the surface of a mine and that, undoubtedly, has led to further tests resulting in an important "find." No record exists of Radio transmission from a mine except by wired Radio—which is the "find" referred to. By this means entombed miners may direct their rescuers as well as receive encouragement, though they be several thousand feet down. When a telephone line breaks, communication ceases; with a broken conductor, wired Radio would still carry the message, it is believed. Radio is an infant even now.

No definite conclusion has yet been reached as to the ultimate language to be successfully employed in international Radio transmission. There are many advocates of Esperanto advancing its claim to universal use and some European countries employ it in attempting to be understood by other nationals. There may always be the difficulty experienced recently when a Polish professor lectured in Esperanto before a microphone in one of the broadcasting studios in his native country. Outside of Poland his talk was little understood because of the accent.

If any of you wish to hear what transpires at the Republican national convention, it will be necessary to stay on the set, so we're told, because the whole thing won't last very long. With the Democratic convention you may be more leisurely. It is reported that Cleveland will be connected with important stations over the country to re-broadcast the proceedings, so that thousands may hear. The New York broadcasts will be open to all companies wishing to transmit the event. Relays by wire will give the majority of American listeners the news.

Since KGO came on the air Eastern fans ask each other how well their programs come through—not IF they do. Hence, it is pretty certain that the students taking up music, economics, literature and Spanish as broadcast from this station are not all Californians. My prediction is that next winter will see a great addition to the many educational features now occupying time on programs offered by these powerful stations. WJZ has been giving an opportunity to its listeners to learn something of French this spring.



# How to Install a Radio Set in Your Automobile

## Part IV—Dodge Installation and Tuning Unit Details

By Harry J. Marx

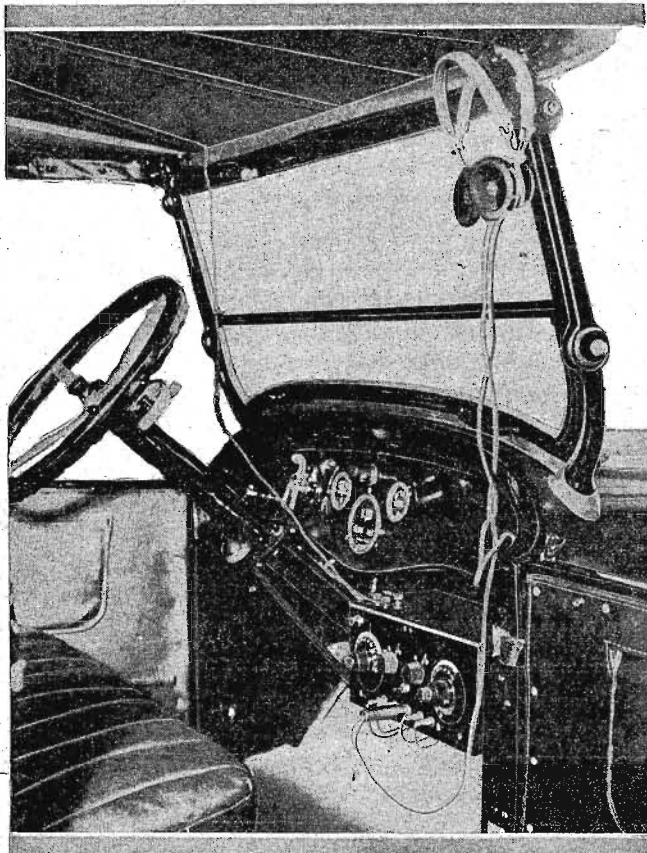


Figure 1

THE Dodge car did not present any big difficulties of installation. All it required was a little forethought and ingenuity. In this case an angle was placed somewhat in the form of a shelf brace and was fastened to the side of the chassis. The set itself is fastened to this angle as shown in Figure 1. Here again the four wire aerial in the top was found to give the best results, although the use of the loop aerial was also satisfactory. In this case the loop was suspended from the cross piece top cover over the rear section of the car. This suspension permitted complete revolving of the loop without being in the way and a discomfort to the passengers.

The ground connection, as before, has

been to the framework of the car or to the rod driven in the ground when at a standstill. Although only a pair of receivers are shown the loud speaker was located in the rear section with a long cord so that it could be plugged in, the

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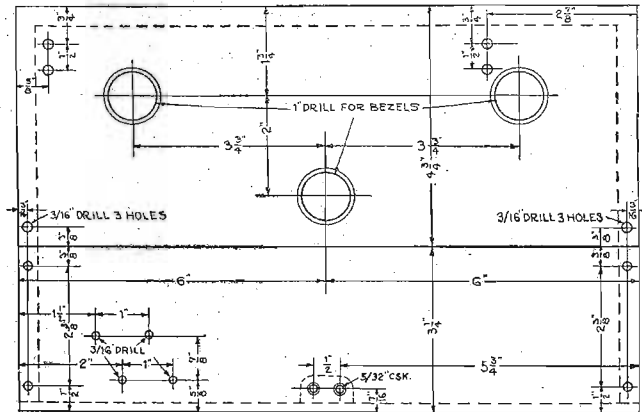


Figure 2

receivers being used merely for tuning the set in.

Here again the installation left sufficient room under the set so as to permit perfect comfort for the passenger of the front seat. The set used is again the one being described as the portable for automobile use, especially to be contained in the suitcase as desired.

#### Cover Panels

Figure 2 shows the dimensions and layout of the two cover panel. This cover panel was made in two sections. The front section becomes an intricate part and is permanently fastened to the base panel and front panel unit. The rear section of the cover panel just carries three holes for bezels, to observe the illumination of the tube filaments and also for a slight circulation of air. In this

compact arrangement where the set is entirely enclosed the heat of three vacuum tubes becomes excessive and will be found to effect the operation of the set unless some means of escape for the heated air is provided. In addition this rear cover must be made removable in order to permit accessibility for changing tubes when necessary or occasional examination of the internal connections.

The dash line running across the front edge indicates the front panel, as this top piece overlaps it. A dash line around the other three sides indicates either the sides and back of a wooden cabinet to enclose the set when used for automobile installation or the interior strips of the suitcase when assembled therein. At the top the two sets of two holes in pairs were used for connection to two

(Continued on page 18)

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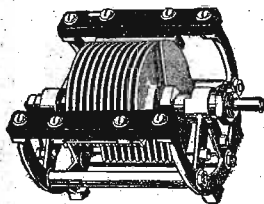


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  - 27 Ft. Insulated Telling
  - 27 Ft. Tinned Bus Bar
  - 2 Fixed Condensers .005 Mfd.
  - 1 Fixed Condenser .0025 Mfd.
  - 1 Grid Leak

Complete parts for Fada 5-Tube Neurodyne Sets—ALL GENUINE FADA PARTS. LIST PRICE \$55.00. OUR PRICE \$51.00. Assembled in cabinet ready to operate, \$71.50.

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Fada 160 Neurodyne Factory-made machines. LIST PRICE \$120.00. OUR PRICE \$89.50.

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Fada Neurodons Kit 3 NEUROFORMERS—2 NEURODONS. LIST PRICE \$25.00. OUR PRICE \$21.00.

Fread-Eisemann Neurodyne Kit NEUROFORMERS—2 NEURODONS. OUR PRICE \$22.50. SHARROCK KIT NEUROFORMERS—2 NEURODONS. OUR PRICE \$15.45. ROYNE COILS \$5.75.

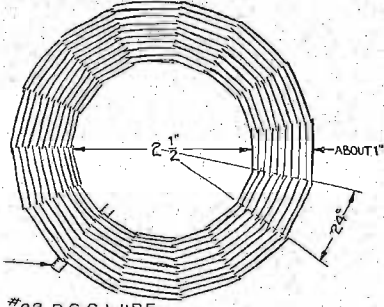
**PORTABLE AUTO SET**

(Continued from page 13)

angles which were already located in the suitcase, so that this can be altered to suit the particular requirements and



WIND ON 15 1/4" STUDS



70 TURNS #22 D.C.C. WIRE  
Figure 3

units of each construction. The three holes on each side are for wood screws to hold the panel against the wooden sides underneath. The four staggered holes in the lower left hand corner are for four binding posts. The two at the top are for the loop connection while on the bottom the left hand one is the ground and the right hand one is put in until all of the wiring is completed and then these terminals are connected by flexible leads to the proper points as indicated in the circuit diagram given in Part II of this series.

The little angle plate shown in the center of the front edge corresponds to the other side shown in the front view of

the control panel, Figure 2 of Part III of this series. This can be made of 1/16 inch sheet brass stock.

**Tuning Unit Details**

Although the appearance of these two tuning units is very similar to a product

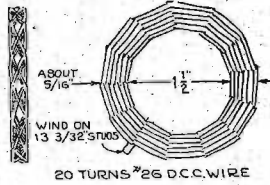


Figure 4

now on the market known as the Long 45 the windings are different. The condenser is a .0025 variable, and has a hollow shaft through which the rotor coupling shaft runs. The fixed winding in both of these units consists of a 70 turn coil of 22 d.c.c. wire wound on a form with an inside diameter at 2 1/4 inches with fifteen 1/4-inch studs spaced 24 degrees apart. This wire is wound over two studs on one side then goes across and over two

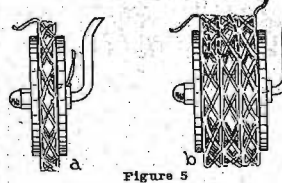


Figure 5

studs on the other side going back and forth in this method until the 70 turns are wound. This winding is the secondary of the air core Radio frequency transformers and is the same for both units. Reference to Figure 3 will make this considerably clearer.

The rotors differ in the two units. Four coils are required of 20 turns of 26 d.c.c. wire wound on 1 1/2-inch diameter form with 13 studs each 3/32 of an inch. This is indicated in Figure 4. Figure 5 shows the two rotor assemblies. The first transformer uses only a single 20 turn coil for the primary, whereas the B illustration of Figure 5 shows the triple coil assembly for the rotor of the second unit. These three coils are connected in series. That is, starting in with the inside turn on one end to be used as the first primary coil connection, the outside end of that coil is connected to the inside of the next coil

and the outside end of that coil goes to the inside end of the third coil. The outside end of the wire of this third coil is the other one of the primary windings. The assembly of the entire unit on the condenser is shown in Figure 6. This

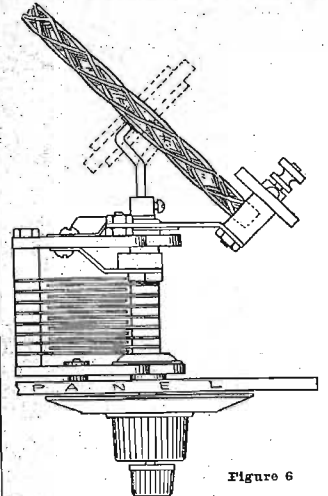


Figure 6

method permits variable coupling between the primary and secondary of each transformer unit and in this manner the control of tube oscillation for this type of tuned Radio frequency coupling becomes a decidedly simple matter.

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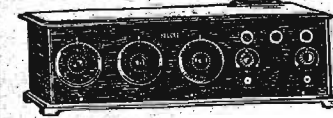
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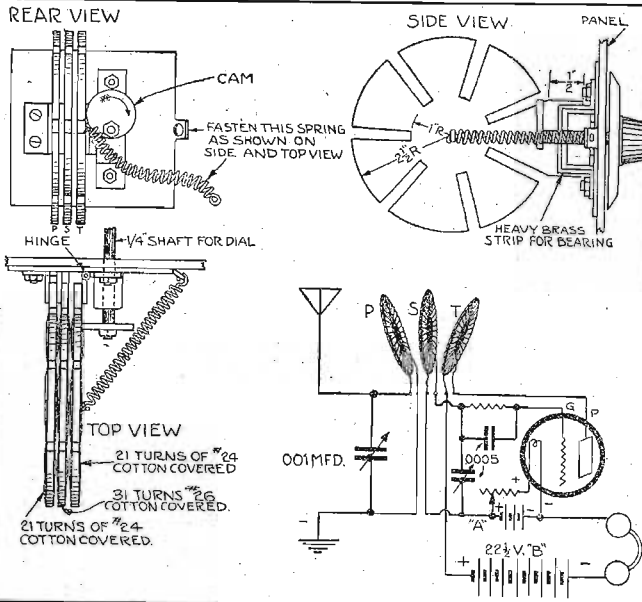
of the coils is accomplished by a dial through a 1/4-inch shaft which has an eccentric attached on the inside end.

The cores for the spider webs were cut out of hard fiber 5 inches in diameter with a solid center 2 inches in diameter. One of the arms is cut 1/2-inch longer than the others in order to fasten the hinge mounting on to an angle of brass.

The base is made of either heavy brass or formica. Brass is preferable because it makes a good bearing. The primary and secondary are bolted to a piece of angle brass and this in turn is bolted to the brass base. These coils should be as close as possible. The tickler is bolted to a small brass hinge and bolted to the base as close as possible to the secondary and primary coils.

There should be a spring to pull the coil tight against the cam. This spring is fastened to the center of the tickler coil and is run to the outer edge of the brass base. The primary and tickler coils each have a winding of 42 turns, counting both sides, with number 24 d.c.c. magnet wire. The secondary has 62 turns, counting on

## COILS OF UNUSUAL CONSTRUCTION



both sides, with number 26 d.c.c.—M. Slis-son, Boulder, Colo.

be equipped with stops to keep the rotor from revolving all the way around, thus breaking the contacts.

### Tips About Variometers

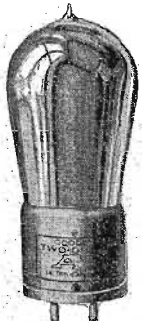
When selecting a variometer, be sure that the shaft that holds the rotor ball is of brass or copper, and not of iron or steel. This will increase resistance. The best variometers have the shaft running only part way through the rotor and not all of one shaft. The shaft should also

be equipped with stops to keep the rotor from revolving all the way around, thus breaking the contacts.

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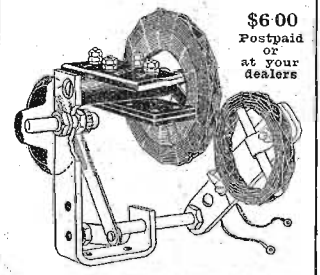
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(Continued from page 15)

Radio receiving unit, and the connections for switching from an enclosed aerial to an external antenna may be readily provided.

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The details set forth in the preceding paragraphs describe a self-containing receiving equipment using six stages of amplification, three of Radio frequency, two of audio frequency, and a detector. With slight modifications, a set of five stages of amplification, two of Radio frequency, two of audio frequency, and a detector. Unless the proper design of vacuum tubes, UV-199 preferably, and an efficient type of Radio frequency transformers are employed, difficulties are likely to be encountered by reasons of the close proximity of the loop antenna to the amplifying circuit.

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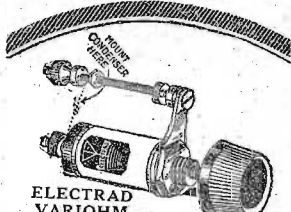
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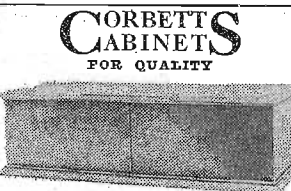


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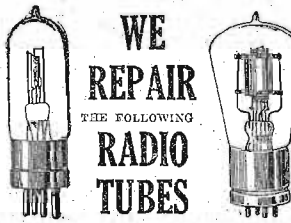
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The STAR FIXT CRYSTAL is the complete answer to this question, and you can get one from almost any five dollar in radio.

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built and adjusted for the reception of the ethereal burdens of music, each, one will naturally inquire, "How is its range?" If this portable unit is aboard a moving conveyance, the offerings of a broadcast station located twenty-five miles away may be heard, despite the noise of a moving automobile or other type of vehicle. If however, you are obsessed with the "itch for distance," the suitcase will have to be stationary and the potentiometer carefully adjusted if your log records are to be boasted of. Other than being a compact form of Radio-phone receiving unit, weighing only 23 pounds, the novelty of music and speech issuing from a leather container will certainly draw the crowds.  
(THE END)

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An outside aerial should be inspected at least twice a year. Insulators covered with soot and dirt should be cleaned thoroughly with a brush and gasoline. A layer of soot on the aerial, along the insulators to the pulley and thence to the pole or other supports, allows a lot of energy to leak off the aerial. If it can be afforded, it would be a good investment to replace the corroded and blackened aerial wire with bright new wire. Enameled wire will not corrode and is worth while.

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**Arrow Battery Co.**  
1421 South Wabash Ave. Dept. Chicago, Ill.



# Increasing the Resistance of the Wire Rheostat

## Varying the Resistance in the Filament Circuit

By J. E. Owen

THE purpose of the rheostat is to introduce a varying resistance in the filament circuit in order to control the voltage across the filament terminals of the vacuum tube. The usual wire rheostat has a constant change of resistance throughout the entire scale of its revolution. There is a critical point for some tubes, and in all tubes there is a certain setting of the rheostat that gives greatest volume with the least amount of current. Increasing the resistance a trifle gives less volume, but within a certain range, better quality of reproduction. This range is comparatively small, but the usual rheostat makes no provision for it.

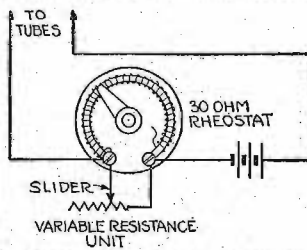
### Varying Amperage

There are a few variable resistance units on the market that may be varied from 0 to 30 ohms, for example, that one can use in the filament circuit to adapt it to the range variation spoken of above. This may be done by shunting it across a rheostat which, for most purposes, must also have a high resistance. For example, in the illustration the rheostat is 30 ohms, say, and the resistance unit is also 30 ohms. But move the slider or the adjustment member out so that only 1/2 of it is being used. Then we have 15 ohms resistance in the resistance unit, and if the rheostat is just turned on, we have 30 ohms in the rheostat. From the well-known electrical law:

$$R = \frac{Y \times Z}{Y + Z}$$

Where R is the resistance of the whole unit, and Y, say, is the resistance of the variable resistance unit and Z is the resistance of the rheostat (the resistance for the certain setting, not for the whole rheostat), we can obtain R for any combination of Y and Z. So in this case Y is 15 and Z is 30 at full scale deflection. Consequently, R solves out to be 10 ohms.

This is enough resistance to control two 1/4 ampere tubes, both tubes being controlled by the same rheostat. However, let us see how the resistance varies with the turning of the knob. Suppose we turn



the rheostat half-way on. Then we have from the above equation that R equals 7.21 ohms. But the total resistance is only 10 ohms. Therefore, for the first one-half of the rotation we have changed the resistance less than 2.8 ohms, slightly more than one-fourth the total resistance. This gives a vernier effect over the range of resistance and the place where this effect will be most pronounced can be controlled by varying Y, or the resistance unit. By setting Y at about 6 ohms. It will be 5 ohms at full resistance of the rheostat, and from the equation it will be found that the first half of the scale deflection gives a change in resistance of only 7 ohms. This means a vernier control at a resistance which will be found about right for a detector tube drawing 1 amp.

### Vernier Control

This form of resistance has the advantage that it may be varied for any type of tube, drawing any amount of current up to about twice what the manufacturer

says is maximum for the units he produces. The usual amount is 1 1/2 amperes, but this may be safely increased with the two resistances in parallel to about 2 1/2 amperes with a factor of safety allowed. Another valuable feature is that the vernier effect is most pronounced the greater the draw of current. This is a very valuable feature, as may be seen when the problem is analyzed. With a 1-ampere detector tube there is a critical point of control. This requires a vernier. However, with a 1/4-ampere tube used as a detector, say, there is no or little effect of the critical adjustment. However, when a rheostat is used that controls two, three or more of these tubes, there is a critical point in that a slight change in resistance means a greater change in the amount of current that flows through the tubes, since the resistance is less when two, three or more tubes are controlled from one rheostat. But this comes back on itself, since the vernier effect is greater with lower resistance settings of the variable resistance unit.

Another advantage is that there are no extra knobs to push in or pull out or turn in order to get the vernier effect. This form of vernier is often unsatisfactory, since it gives quite a bit of trouble. In other vernier rheostats that use one knob, it is necessary to turn the rheostat through a great many revolutions in order to cover the entire range, since the vernier effect is used over the entire scale. As may be seen, however, this is unnecessary, and in fact undesirable. This form of rheostat unit has none of the above faults. It will be found to give entire satisfaction in any Radio circuit.

Don't take a reading of your B batteries with an ammeter. Use a voltmeter. One test with an ammeter will draw as much current from the battery as you would in a month of regular service.

### Connection for Headsets

Headphones, generally speaking, operate the best when the positive side of the phones is connected to the positive side or lead of the B battery. Some phone cords are marked with a red stripe to indicate the positive cord of the phones. But if the phones aren't marked try them connected one way and then reverse these conditions. The positive side will be indicated by the connection that gives the clearest and loudest signals.

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7x11 1/2	4.24	4.71	7.95
7x12 1/2	4.67	5.14	8.81
7x13 1/2	5.10	5.57	9.67
7x14 1/2	5.53	6.00	10.53
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Patents Pending. Name Registered

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Copyrighted diagram of this tuner, 50c, or with all parts, \$9.00. Complete instrument in walnut cabinet, ready to use, \$15.00.

A New and Wonderfully Efficient Coil for the Relnartz circuit for those who want the best. Price \$3.00, or with blueprint for either one or three tubes, \$3.50. This circuit brings in both coasts loud and clear and is the most successful Relnartz modification yet produced.

All goods prepaid. These instruments are easy to build, easy to operate. Everything clearly shown.

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CHICAGO

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# Questions and Answers

### D.C. Charging

(02953) ELS, Smithland, Iowa.  
I have access to 110 volt direct current. Can I use this profitably for charging 6 volt or 2 1/2 volt storage batteries? The current is furnished me free. Will you explain a diagram for same. Would you recommend carbon filament, or tungsten filament lamps or resistance coil? If lamps use rate of watts per hour. How can I determine the polarity of the wires? Could I measure the amperage and voltage going into batteries with an ammeter and voltmeter used for dry cells?  
A.—We are advising in your inquiry that a 110 volt direct current system is available for charging storage batteries. Connect the positive of 110 volt system through a 40 watt lamp to the positive B battery and the negative of system to negative of B battery.  
Connect six volt battery through a 200 watt, or its equivalent, in the same manner.  
The correct polarity can be determined by placing two wires from the 110 volt

system in a glass of water, spacing them at 1/2 inch, when the negative will produce twice as many bubbles as the positive. The voltmeter used for dry cells is not suitable for storage batteries.

### Crystal Set

(07324) RMDeR, Hollywood, Calif.  
In Feb. 2nd issue of the Digest, on page 18, a Mr. Amundsen describes a crystal set. Being a beginner I would like to ask a question or two.  
First, which is the 23-plate condenser? The diagram is not marked showing that everyone, perhaps, should know, but Mr. Amundsen must not forget, that there are still some who would not know.  
Also, how many turns, and of what size wire on the honeycomb coil?  
A.—In the circuit of your inquiry, a forty-three plate condenser is connected in series with the antenna and a twenty-three plate condenser is connected across the honeycomb coils. A .001 mfd phone

condenser is indicated connected across the phones.

Honeycomb coils are generally wound with number 24 dec. wire. Fifty turn coil is specified.

### Variocoupler Windings

(08102) GM, Nappanee, Ind.  
I have a standard 180 degree variocoupler. I want to have the windings so I can receive between 130 and 400 meters. How many turns should the stator have? The rotor? I will use it in the Haynes D. X. set. I will use a 26-plate condenser across the secondary.

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11 FEET LONG  
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Full instructions and Blue Prints furnished with each kit. Absolutely guaranteed. These transformers are suitable for any Super-Heterodyne circuit. Put up in handsome kit display box. Special discount to dealers. Prompt delivery. Write for special circular.

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Box of Instructions with template, Blue Print, 1.00  
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10-ft. Bun Bar—Spaghetti—Blue Print.  
This unusual low price offer puts this most wonderful Four Tube Superdyne Set, which is the last word in radio, within the reach of all. Each set comes with complete blue print, so that it is perfectly easy to assemble by anyone in a few hours. Absolute satisfaction guaranteed or money back. Send Cash, Check or Money Order.  
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**A67.** Canton, O. 425 meters. Edgts. 1320th Field Artillery Co. Central.

**A76.** St. Paul, Minn. 400 meters. 6th Inf. Minn. Nat'l Guard, St. Paul Armory. Irregular schedule. Central.

**AWS.** Dayton, O. McCook Field, U. S. Army. Experimental music only.

**B1.** Tacoma, Wash. 480 meters. 50 watts. Camp Lewis, U. S. Army, Third Signal Corp. Discontinued indefinitely.

**CFAC.** Calgary, Alta. Can. 430 meters. 1000 watts. Calgary Herald, Daily ex Sun, 1 pm; Tues, Wed, Fri, Sat, 7:45-8:45; Mon, Thurs, 8-11; vocal, dance music, news, market, weather, Sun, 11 am, 7:30-9 pm, church services, Mountain.

**CFCA.** Toronto, Ont. Can. 460 meters. Toronto Star, Daily ex Sun, 12 m, weather, news, stock; 5:30-6 pm, news; 8-9 pm, music, Sun, 7 pm, church services, Eastern.

**CFCF.** Montreal, P. Q., Can. 400 meters. 100 watts. Montreal Wireless Telegraph, Daily 12-13 pm, Mon, 7:30-12 midnight; Wed, 8-8 pm; Fri, 7:30-12 midnight, music, entertainment, reports, Eastern.

**CFCH.** Quebec, Que. Can. 410 meters. La Cite de l'Événement.

**CFCK.** Edmonton, Alta. Can. 410 meters. 115 watts. Radio Sports Co. Ltd. Daily ex Sun, 8:45-9:45 pm, music, Sun, 7:30-9 pm, concert, lecture.

**CFCL.** Victoria, B. C., Can. 500 meters. 300 watts. Confessional Methodist Church, Slogan, "Where Religion Meets the People," Daily ex Sun, 7:30-8:30 pm, church services, Pacific.

**CFCN.** Calgary, Alta. Can. 400 meters. 300 watts. W. W. Grant Radio Ltd. Slogan, "Voice of the West," Daily ex Sun, 7:30-8:30 pm, news, reports, Sat, 10-12 pm, dance music, Sat program, Sat afternoon, Mountain.

**CFCD.** Bellevue, B. C., Can. 450 meters. Semmelbach-Dickson, Ltd. Daily ex Sat, Sun, 8:45-10:30 pm, news, markets, reports, sports, time, music, Sat, 8:30-11 pm, entertainment, Sun, 9:10-10:30 pm, church services, Eastern.

**CFCE.** Vancouver, B. C., Can. 350 meters. 10 watts. Radio Specialties, Ltd. Tues, Thurs, Sat, 7:30-8:30 pm, music, Wed, 4-5 pm, music, Sun, 8:30-9:30 pm, classical music, Central.

**CFER.** Sudbury, Ont. Can. 410 meters. 100 watts. Laurentide Air Service, Ltd. Daily ex Sun, 1 pm, 7 pm, stock, financial news, Wed, 8:30-9 pm, music, W. W. Grant Radio Ltd. Slogan, "Voice of the West," Daily ex Sun, 7:30-8:30 pm, news, reports, markets, entertainment, Sun, 9:30-9:45 pm, church services, Mountain.

**CFER.** Kingston, Ont. Can. 460 meters. 500 watts. Queen's University, Kingston, Ontario, Slogan, "The Queen's Voice," Daily ex Sun, 7:30-8:30 pm, news, reports, markets, entertainment, Sun, 9:30-9:45 pm, church services, Mountain.

**CFEX.** New Westminster, B. C. 440 meters. Westminster Post Co. Central.

**CFYV.** Vancouver, B. C. 400 meters. Victor W. Oullum, CHAC, Halifax, N. S., Can. 400 meters. 20 watts. Radio Engineers.

**GHBC.** Calgary, Alta. Can. 410 meters. The Alberta Pub. Co. Daily ex Sat, 8:45-9 pm, news, stock quotations, music, Mountain.

**GHCC.** Toronto, Ont. Can. 400 meters. Marconi Wireless Tel. Co. Central.

**GHQC.** Quebec, Que. Can. 410 meters. Canadian Wireless and Electric Co. Mon, 7:30-8 pm; Wed, 8-8:30; Sat, 8-10, music, Eastern.

**GHVE.** Victoria, B. C., Can. 310 and 400 meters. Western Canadian Radio Supply, Ltd. Slogan, "The Voice of the Island," Daily ex Sun, 7-8 pm, music, stock reports, entertainment, Sun, 9:30-9:45 pm, church services, Pacific.

**GHVL.** Vancouver, B. C., Can. 440 meters. 2000 watts. The Vancouver Merchants Exchange, Ltd. Eastern.

**GHVM.** Calgary, Alta. Can. 430 meters. 500 watts. Hiley & McNeil, Ltd., Thurs, 7:30-8:30 pm, musical, Mountain.

**GHVN.** Hamilton, Ont. 410 meters. Hamilton Spectator Daily.

**GHVC.** Montreal, Que. Can. 341 meters. 500 watts. Sorbonne Elec. Wed, 8:20 pm, Sun, 7 pm, Eastern daylight saving.

**GJCA.** Edmonton, Alta. Can. 450 meters. 500 watts. Edmonton Journal, 440 meters. 800 watts. Sun in Sunny Alberta, Club, "Jingo Hut," Daily ex Thurs and Sun, 12:30 pm, weather, markets, 7:30-8 pm, children's half hour, 8:30-9:30 pm, concert, lecture, Thurs, 10-12 pm, Jingo Hut meetings, Mountain.

**GJCD.** Toronto, Ont. Can. 410 meters. 300 watts. GJCO. Daily ex Sat, Sun, 4-4:30 pm, music, Eastern.

**GJCE.** Vancouver, B. C., Can. 420 meters. Sport-Shop Radio Co. Daily ex Sun, 12:30-1 pm, music, Pacific.

**GJCL.** St. John, N. B., Can. 400 meters. Maritime Radio Corp. Ltd. Daily ex Wed, Fri, 7:30-9 pm, music, Sat, 9-11 pm, music, Eastern.

**GJCM.** Montreal, Que. Can. 312 meters. 250 watts. Dr. J. L. P. Landry. Slogan, "Three weeks below Quebec where civilization nearly ends," Daily ex Sun, 7:30-8:30 pm, news, market, news, Sun, 8-10, music, Pacific.

**GJCN.** Toronto, Ont. Can. 410 meters. Shamos Agency & Co. Slogan, "The Voice of the West," Daily ex Sun, 7:30-8:30 pm, news, market, news, Sun, 8-10, music, Pacific.

**GJCO.** Ottawa, Ont. Can. 400 meters. 200 watts. Perle's W. Shackleton, Ltd. Slogan, "The Voice of the West," Daily ex Sun, 8:45-9:45 pm, news, market, news, Sun, 8-10, music, Pacific.

**GJCP.** Toronto, Ont. Can. 430 meters. 100 watts. London Free Press. Daily ex Sun, 7:15-8:15 pm, news, market, weather, music, entertainment, Eastern.

**GJCC.** Montreal, Que. Can. 425 meters. 2000 watts. La Presse, Wed, Fri, Mon, 1:45 pm, orchestra, Daily ex Sat, Sun, 4 pm, music; 4:30, weather, markets, stocks; Tues, Thurs, Sat, 7 pm, children's hour; 7:30-8:30, concert; 10:30, special, Sun, 4:30 pm, sacred music, Eastern daylight saving.

**GJCB.** Vancouver, B. C., Can. 410 meters. 2000 watts. Vancouver Daily Province, Daily ex Sun, 7:30-8:30 pm, news, market, news, entertainment, Pacific.

**GJCE.** Toronto, Ont. Can. 450 meters. 750 watts. Can. Ind. Telephone Co. Occasional programs.

**GJCH.** Ottawa, Ont. Can. 415 meters. 500 watts. Canadian National Railway, West, Sat, 7:30 pm. Eastern daylight saving.

**GJCF.** Saskatoon, Sask. Can. 420 meters. 500 watts. Leader Pub. Co. "The Queen City of the West," Daily ex Sun, 9:54, 10:10-10:50 am, 2:15-3 pm, 7:30-8:15 pm, news, market, news, Sun, 8-10, music, Pacific.

**GJCG.** Ottawa, Ont. Can. 410 meters. 200 watts. Montreal World-Supply Co. Ltd. Slogan, "The Voice of the West," Daily ex Sun, 7:30-8:30 pm, news, market, news, Sun, 7-8 pm, church services, Eastern.

**GJCV.** Winnipeg, Man. Can. 450 meters. 500 watts. Manitoba Tel. System, Daily ex Sun, 12:30-1:30 pm, music, lecture, ex, 1:15-2 pm, music, news, weather, Tues, Thurs, Fri, 8:15-8:45 pm, bedtime story; 8:25-10 pm, lectures, Sun, 7-9 pm, church services, Central.

**GJCW.** Paris, France. Eiffel Tower. 7300 meters. Central. Wed, 8:15-9:35 pm.

**GJCB.** Mexico City, Mex. 370 meters. 500 watts. E. Buco, Thurs, Sat, 7:30-9 pm, Thurs, 8-10 pm, concert, Mexico City, Mex. 510 meters. 500 watts. La

**GYX.** Mexico City, Mex. 320 meters. 300 watts. Excelsior Park, Slogan, "Land of the Aztecs," Mon, 8-10:30 pm, Thurs, 7:30-9 pm, Mountain.

**ESP.** Paris, France. 600 meters. 1000 watts. Superior School P. F. T. Mon, Wed, Fri, Sat, Sun, 8:30 pm, talks, music, Tues, 3 pm, English course, Thurs, 8:45, tonic of the day, G. M. T.

**H1.** Geneva, Switzerland. 1100 meters. 600 watts. Miropac & Wireless Telegraph Co. Ltd. Daily ex Sun, 8:15 pm, music, news, Swiss.

**KELV.** Prague, Czechoslovakia. 1150 meters. 1000 watts. Radio-Journal Broadcasting, Daily ex Sun, 10 am, 11:30, 1:30, 5, 6, exchange rates, stocks, markets; 7:15-8 pm, concert; 8:45-9:30 pm, European mean time, one hour in advance G. M. T.

**KDKA.** Pittsburgh, Pa. 320 meters. 1000 watts. Westinghouse Elec. Co. Daily ex Sun, 8:45-10:10 am, 12-1 pm, market reports, music; 6-10 pm, news, features, market, concert; 9:55-10:10 pm, time, Sun, 10:45 am, church services; 5:30, dinner concert, Eastern.

**KOPM.** Cleveland, Ohio. 275 meters. 500 watts. Westinghouse Elec. & Mfg. Co. Central.

**KOPT.** San Diego, Calif. 324 meters. 50 watts. Southern Calif. Slogan, "At the End of the Trail," Daily ex Sun, 1:30-3:30 pm, 6:30-6:45.

**KDYL.** Salt Lake City, Utah. 1900-11:30 am. Pacific.

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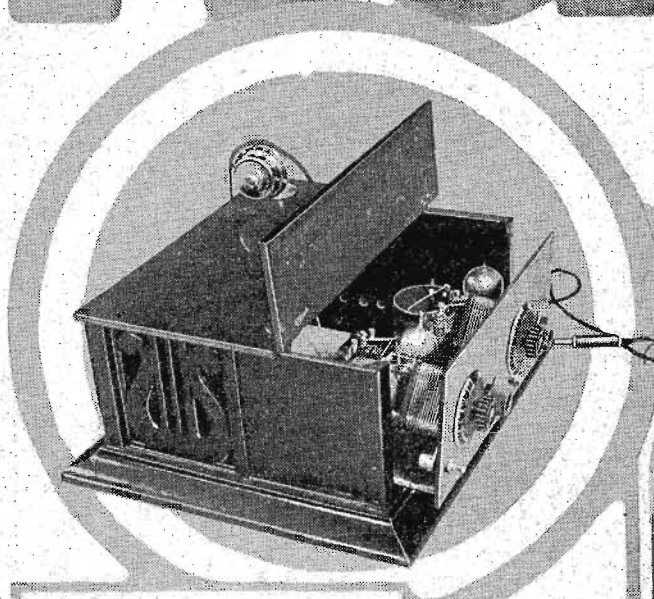
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# Radio Illustrated



A two-tube reflex has been installed in an old phonograph cabinet, by an ardent Philadelphia Radiophan. Everything has been removed from the case but the horn, and that is connected direct to the set. ©Keystone



One of Chicago's youngest Radiophans, Billy Miller, listening in with a crystal set which his father has built for him. From little Billy's expression, the announcer must have struck his fancy with a funny story. P. & A. Photo



Vacation time is almost here. What could be sweeter than a balmy summer's day at Atlantic City, a Radio set and a broadcast full of pretty girls

Buffalo, N. Y. (Eastern Daylight Saving) 7:00-8:00 p. m. organ, George Albert Bonchard; 8:30-9:00 p. m. The Radio Dealers Musical program; 9:30-10:00 p. m. Lopez Hotel Statler orchestra; 8:45-9:00 p. m. Dibble, tenor; 9:00-10:00 p. m. concert, Melody Music. KFAF, Denver, Colo. (mountain) 7:00-8:00 p. m. KFAF Gloom Busters; talk, Denver Heat change.