

# Radio Digest

EVERY WEEK

# Illustrated

TEN CENTS

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

Vol. VI

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SATURDAY, SEPTEMBER 8, 1923

No. 9

## HANDWRITING BY RADIO



Mrs. Calvin Coolidge, right, first lady of the land, is a Radiophan. She is shown with the set in her apartment at the New Willard Hotel where she and President Coolidge lived in Washington prior to their removal to the White House. Above is Mary Lee, known as the "Radio Queen" of Chicago on account of her singing from KYW and WJAZ @U.&U.

### BOWDOIN MUM; FIRST DX TALK TO GET SET

WJAZ, Worried Over Ship's Silence, Offers Receiver

CHICAGO.—Anxiety caused by lack of recent word from the Polar expedition, headed by Dr. Donald MacMillan, has led Station WJAZ, Chicago Radio Laboratory, to offer to the first amateur in the United States or Canada communicating with the Bowdoin, on which the MacMillan party is making its way through the Arctic, a complete regenerative tuner and amplifier, an exact duplicate of the set aboard the Bowdoin.

### DIRECTION FINDERS HELP LAKE BOATS

VESSELS REDIRECTED TO PATHS BY AIR GUIDE

Pointer on Movable Loop Over Compass on Chicago's Pier Fixes Crafts' Position

CHICAGO.—So that ships lost on the Great Lakes may learn their bearings, the United States government has established a new system in conjunction with the naval station at Great Lakes and its control on the municipal pier, Chicago. The method is similar to that applied to shipping on the east and west coasts and to the Gulf marine.

Heretofore, when vessels on the lakes were in doubt as to their positions, it was necessary, especially on stormy or dark night, for their masters or navigation officers to work long and hard to re-determine their courses. This process of course was attended by an element of danger.

#### Sends QTE? Receives MO

The new system enables the master of a ship, through the Radio operator, to re-locate his path in a few minutes. On order from the captain the Radio operator sends the call (international code) QTE—"What is my bearing?" The naval station at Great Lakes, through its control on the Chicago municipal pier, then awaits the repeated MO which enables the naval operator to compute the latitude and longitude of the craft.

By means of a movable loop a pointer attached to it is swung by the naval operator over a compass. The volume of sound produced by the MO, that is, its intensity, serves as a basis for figuring the position of the transmitting station aboard the ship. The direction finder at the naval station gauges the maximum volume of the MO, then tunes out until the MO is silent. Midway between the maximum and the zero points on the compass is the position of the ship.

### New Airphone Society in Rio

RIO DE JANEIRO.—A Radio organization, known as the Radio Sociedade do Rio De Janeiro, has been formed here; it already has more than 100 members.

### FRENCHMAN TRANSMITS AIR SCRIPT

Sends Long Actual Written Message in Only Six Minutes

Dollar Is Total Expense

Revolving Cylinder, Lights and Mirrors Feature Device Which Also Copies Photos

PARIS.—Absolute facsimiles of Radio telegraph messages in the original handwriting of the sender are now being sent every day over the French Government stations by the Belin system, which is an adaptation of the inventor's method of transmitting photographs by wire.

The sender of the telegram writes it on ordinary paper which is placed on a re-

(Continued on page 2)





# PARTS BUYERS HEED CALL OF WEATHER

## NEED FOR DEVICES RISES AS TEMPERATURE DROPS

### Ill Wind That Blew Cold Causes Greater Demand All Over Land for Apparatus

**SPECIAL REWARD OFFER**  
**Coupon Number 15**

This Special Reward Coupon appears each issue in Radio Digest until further notice. When sent in, accompanied by necessary remittance, according to the rules governing same, apparatus can be secured. See apparatus list and rules of offer below.

**Save Me—I Am Valuable**

The recent ill wind that blew chill and damp over almost all the United States blew good in that it aided considerably the reception of Radio signals. The same meteorological phenomenon caused readers of the Radio Digest to increase their interest in the offer to supply parts at low prices.

Where low temperatures prevailed, where clear starry nights marked the season, the demand for parts rose highest. As the year grows and the summer wanes inquiries as to the parts offer will gain in number.

#### Rules to Remember

One point must be emphasized to those contemplating taking advantage of the special offer; that is, that the coupons turned in for any item must be numbered consecutively, as for example, 1, 2, 3, and 4 or 3, 4, 5 and 6. The number of coupons necessary and the cash remittance, of course, depend on the item sought by the reader. There is no limit to the number of series turned in by any one reader.

Another point to remember is that cash, checks and money orders but no postage stamps will be accepted.

To make selection more simple the items have been divided into eight classes, each class depending on the number of consecutive coupons and amount of cash remittance necessary. The eight classes of items follow:

#### Class A Articles

For two consecutively numbered coupons and thirty cents (\$0.30) any one of the following articles will be sent: 1 Carter Imp Jack and Plug; 1 Carter 15-Ohm Resistance Unit; 1 Schindler .00025 mfd. Build-up Mica Condenser; 1 Schindler .0005 mfd. Build-up Mica Condenser; 1 Schindler .001 mfd. Build-up Mica Condenser; 1 Schindler .0025 mfd. Build-up Mica Condenser; 1 Martin-Copeland Sta. Fut Plug; Walnut Standard Tube Socket; Walnut UV-199 Socket; Ray-O-Vac Dry Battery, 1½ volts; Dubilier Micacons Type 601 (.0001, .00025, .0005, .001, .002, .0025, .003 or .004 mfd.); Premier Grid Condenser (.00025 or .0005 mfd.); Premier Variable Resistance; 1 Carter 25-ohm Resistance Unit; Standard Socket Adapter for Delta Midget Tube; Electrad Grid Leak (1, 1.5 and 2 megohms, with clips); Amco 3-inch Dial; Amco Inductance Switch; Freshman Micon Condensers, (.00005, .00025, .00035, .0005, .001, .0015, .002, .0025, or .003 mfd.); Teleradio V. T. Socket; B-Metal Mounted Crystal; Aerovox Lightning Switch; Aerovox Series Parallel Switch; Aerovox Contact Lever; Na-Ald Small Space Socket; Se-Ar-De Vernier Adjuster; Basco Switch Lever Assembly; 3" Radion Dial, black; 2¼" Radion Dial, black; 3"x1" Radion knob with shafts, ⅜" or ½", black; 3" Radion Dial, ribbed surface.

#### Class B Articles

For four consecutively numbered coupons and sixty cents (\$0.60) any one of the following articles will be sent: 1 Carter .04 mfd. Special Fixed Condenser; 1 Carter Jack Switch; 1 Carter Hold-Tite Jack, One Spring Open Circuit; 1 Carter Hold-Tite Jack, Two Spring Closed Circuit; 1 Carter Hold-Tite Jack, Three Spring Filament Control; 1 Carter Hold-Tite Jack, Four Spring Closed Circuit; 1 Carter Hold-Tite Jack, Five Spring Filament Control; 1 Pudlin Variable Grid Leak with .00025 mfd. Condenser; 1 Federal Universal Phone Plug; 1 Federal Open Circuit Jack; 1 Federal Closed Circuit Jack; 1 Federal Double Circuit Jack; 1 Martin-Copeland Shur Grip Plug; 1 Martin-Copeland WD-11 Socket; 1 Martin-Copeland WD-11 Adapter; 1 Martin-Copeland UV-199 Socket; 1 Martin-Copeland UV-199 Adapter 1 Martin-Copeland Pull Switch; 1 Martin-Copeland 5-point Inductance Switch; 1 Martin-Copeland Variable Grid Leak; 1 Martin-Copeland SPST Knife Switch; 1 Martin-Copeland SPDT Knife Switch; 1 Martin-Copeland DPST Knife Switch; 1 Martin-Copeland DPDT Knife Switch; Walnut Variable Grid Leak; Walnut Inductance Switch; Dubilier Micacons Type 600 (.0001, .00025, .0005, .001, .002, .0025, .003, .004, or .005 mfd.); Dubilier Micacons Type 610 (.001, .002, .0025, .003, .004, or .005 mfd.); Dubilier Micacon Type 601 (.006 mfd.); Dubilier By-Pass Condenser (.1, .25, or .5 mfd.); Premier Universal Tube Socket; Premier Radio Dial (3/16, ¼, or 5/16 in. black or white face); Premier Universal Radio Jack, Open Circuit; Premier Universal Radio Jack, Two-Circuit Three Spring; Premier Universal Radio Jack, Two-Circuit Four Spring; Premier Universal Radio Jack, Filament Control Three Spring; Premier Switch Lever and 10 Points; Turney Spider Web Coil (SW-10 with .038 millhenry inductance, SW-15 with .066 MH., or SW-20 with .300 MH.); Amco 6-Ohm Rheostat; Freshman Fix-O Grid Leak and Condenser; Freshman Variable Resistance Leak (with or without condenser); Freshman Micon Condensers (.006 or .005 mfd.); Teleradio 6-Ohm Rheostat; Teleradio 30-Ohm Rheostat; Teleradio Lightning Arrester; B-Metal Crystal Tube Detector Type A; B-Metal Adjustable Detector Type D; Aerovox Rheostat; Se-Ar-De Vacuum Tube Socket; Basco Crystal Detector Assembly; Basco Rheostat, 3-ohm or 6-ohm; 3¼" Radion Dial, black; 4" Radion Dial, black; 4" Radion Dial, black, ribbed surface.

#### Class C Articles

For six consecutively numbered coupons and ninety cents (\$0.90) any one of the following articles will be sent: 1 Carter 6-Ohm Vernier Control Rheostat; 1 Carter

"Tu-Way" Plug; 1 Federal Panel Mount Socket; 1 Federal 6-Ohm Rheostat; 1 Federal 3-Ohm (Power) Rheostat; 1 Amperite Automatic Filament Control (with mounting); 1 Martin-Copeland Marco Rheostat; 1 Martin-Copeland Serles Parallel Switch; 1 Martin-Copeland DPDT Panel Switch; 1 Martin-Copeland 7-Point Inductance Switch; 1 Martin-Copeland 9-Point Inductance Switch; 1 Martin-Copeland 11-Point Inductance Switch; Walnut Variable Grid Leak with .00025 mfd. Condenser; Walnut Variable Condenser (3-plate .00006 mfd.); Ray-O-Vac Dry Battery, 2 cells 1½ volts; Dubilier Ducon; Dubilier Micacon Type 600 (.006 mfd.); Dubilier Micacon Type 610 (.01 or .02 mfd.); Dubilier By-Pass Condenser (1 mfd.); Premier Universal Radio Jack, Filament Control Five Spring; CRL Variable Grid Leak, without condenser; Premier No. 250 Variable Resistance, panel mounting; Thordarson Vernier Rheostat; Ritter Loop Aerial; Martin Copeland Variable Grid Leak; Amco Multiple Point Inductance Switch; Amco 20-Ohm Rheostat; Amco 50-Ohm Rheostat; Freshman Antenna; Freshman Micon Condenser, .01 mfd.; Teleradio Variable Condensers, (3-plate or 11-plate); Set "Read EM" Binding Posts (9); B-Metal Crystal Tube Detector Type B; Illinois Cushion Resilient Socket; Aerovox Antenna Plug; Aerovox Potentiometer; Aerovox Crystal Detector; Se-Ar-De Adjustable Vernier Condenser; Basco Tuning Coil; Basco Vernier Rheostat; Radion Panel ⅜"x7"x9", black or mahogany; Radion Panel ⅜"x7"x12", black.

#### Class D Articles

For eight consecutively numbered coupons and one dollar and twenty cents (\$1.20) any one of the following articles will be sent: 1 Carter 20-Ohm Vernier Control Rheostat; 1 Schindler Radio Frequency Transformer; 1 Martin-Copeland 13-Point Inductance Switch; 1 Martin-Copeland 15-Point Inductance Switch; 1 Martin-Copeland 19-Point Inductance Switch; Walnut Variable Condenser (5-plate .001 mfd.); Ray-O-Vac No. 451 B Battery, 2½ volts; Ray-O-Vac Dry Battery, 3 cells 4½ volts; Electrad Variom, with mica condenser; Dubilier By-Pass Condenser (2 mfd.); CRL Variable Grid Leak with Condenser; Resistometer (Type A or 2A); Thordarson Variable Condenser, .00025 mfd.; Amco 300-Ohm Potentiometer; Freshman Micon Condenser, .015 mfd.; Teleradio Variable Condenser, 23-plate; Aerovox Crystal Detector and Condenser mounted; Se-Ar-De Variable Grid Leak, with condenser mounting; Fil-Ko-Stat; R. S. C. Vernier Condenser, 3-plate; Radion Panel ⅜"x7"x12", mahogany; Radion Panel ⅜"x7"x18", black; Radion Panel ⅜"x9"x14", black; Radion Panel ⅜"x10"x12", black.

#### Class E Articles

For ten consecutively numbered coupons and one dollar and fifty cents (\$1.50) any one of the following articles will be sent: 1 Carter 6-Ohm Automatic Control Rheostat; 1 Carter 20 Ohm Automatic Control Rheostat; 1 Demcal 3-Plate Variable Condenser; Walnut Variable Condenser (13-Plate .00025 mfd.); Ray-O-Vac Dry Battery, 4 cells 1½ volts; Dubilier Variom (.0004 or .0006 mfd.); Resistometer (Type B); Delta Midget Tube and Socket; Thordarson Variable Condenser, .0005 mfd.; Freshman Micon Condenser, .02 mfd.; B-Metal Crystal Tube Detector Type C; Aerovox 3-Gang Socket;

Aerovox Double Slide Tuning Coil; Na-Ald 3-Plate Vernier Condenser, with dial; Radion Panel ⅜"x7"x18" mahogany; Radion Panel ⅜"x7"x21", black.

#### Class F Articles

For twelve consecutively numbered coupons and one dollar and eighty cents (\$1.80), any one of the following articles will be sent: 1 Acme Pot-Rheo (potentiometer and rheostat); Walnut Variable Condenser (23-Plate .0005 mfd.); Ray-O-Vac No. 2151 B Battery, 2½ volts; Dubilier By-Pass Condenser (3 mfd.); Premier Variable Condenser without dial (.00039 mfd.); Thordarson Variable Condenser, .001 mfd.; Amco Compensating Grid Condenser; Freshman Micon Condenser, 0.25 mfd.; Teleradio Variable Condenser, 43-plate; Se-Ar-De 3-Plate Condenser; Radion Panel ⅜"x7"x21", mahogany; Radion Panel ⅜"x7"x24", black; Radion Panel ⅜"x10"x12", black; Radion Panel ⅜"x9"x14", mahogany; Radion Panel ⅜"x10"x12", mahogany.

#### Class G Articles

For fourteen consecutively numbered coupons and two dollars and forty cents (\$2.40) any one of the following articles will be sent: 1 Federal 7-Plate Variable Condenser; 1 Federal 11-Plate Variable Condenser; 1 Federal 21-Plate Variable Condenser; 1 Federal Anticapacity Switch; 1 Demcal Variable Condenser 11-Plate Walnut Variable Condenser (43-Plate .001 mfd.); Dubilier Variation (.001 mfd.); Dubilier By-Pass Condenser (4 mfd.); Premier Variable Condenser with dial (.00078 mfd.); Premier Hegehog A. F. Transformer, 4 to 1 Ratio; Thordarson A. F. Transformer, 3.5 to 1 Ratio; Thordarson Variable Condenser, with vernier, knob and dial (.0005 mfd.); Thordarson Variable Condenser, with vernier, knob and dial (.00025 mfd.); Ritter Grand Crystal Set; Amco Double H. C. Coil Mounting; Na-Ald 13-Plate Precision Condenser, with dial (.000297 mfd.); Na-Ald 23-Plate Precision Condenser, with dial (.000523 mfd.); Se-Ar-De 9-Plate Condenser; Se-Ar-De 17-Plate Condenser; B. S. C. Variable Condenser, 23-plate; Radion Panel ⅜"x7"x24", mahogany; Radion Panel ⅜"x10"x12", mahogany; Radion Panel ⅜"x12"x21", black; Radion Panel ⅜"x14"x18", black.

#### Class H Articles

For sixteen consecutively numbered coupons and three dollars (\$3.00) any one of the following articles will be sent: 1 Federal Audio Frequency Transformer No. 228 W; 1 Demcal 23-Plate Variable Condenser; 1 Acme Frequency Transformer; 1 Acme Radio Frequency Transformer (R-2, R-3, or R-4); Walnut Variable Condenser (13-Plate vernier); Walnut Variable Condenser (23-Plate vernier); Ray-O-Vac No. 2301 "B" Battery 45 volts; Ray-O-Vac Dry Battery, 6 cells 1½ volts; Dubilier Duratran (R. F. transformer); Premier Micrometer Variocoupler with dial; Premier Variable Condenser with dial (.0015 mfd.); Premier Variable Condenser with vernier (.0004 mfd.); Premier Hegehog A. F. Transformer, 10 to 1 Ratio; Premier Hegehog A. F. Transformer, Tube Socket Type, 4 to 1 Ratio; Turney Spider Web Coil Mount, Type B; Thordarson A. F. Transformer, 6 to 1 Ratio; Thordarson Variable Condenser, with vernier, knob and dial (.001 mfd.); T. B. H. Radio Heat Set, 2,000 ohms; Tulip Loud Speaker, 15-inch, white; Teleradio Vernier Condenser, 23-plate; Teleradio 2,000-Ohm Head Set; Na-Ald Tuned R. F. Transformer, one stage; Na-Ald 43-Plate Precision Condenser, with dial (.001 mfd.); Se-Ar-De 35-Plate Condenser; R. S. C. Variable Condenser, 43-plate; Basco Radio Frequency Transformer; Radion Panel ⅜"x12"x21", mahogany; Radion Panel ⅜"x14"x18", mahogany.

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## Looking Ahead

**A New One Worth Trying—The Miloplex Circuit—Soon to be described in the Digest.** This new hook-up rivals the famous Flewelling Flivver with its results. We introduced you to the flivver last fall, and the world is still talking about it. The world will shout about the Miloplex. Simple, costs little, and gets the country!

**Conclusion of the Five Tube Neutrodyne Set Series—Next issue Mr. Marx will give the instructions for neutralizing the capacity coupling between the tube by the adjustment of the small neutrodons.** He will also tell how to operate the set. Don't miss the conclusion whatever you do.

**Plate or B Batteries—All About Them—The sixteenth chapter of Mr. Benson's series for Radio beginners will appear next week and be devoted to a discussion of plate batteries, their maintenance and failing points.** Worth knowing.

**Simplex Diagram Means Simple Picture Illustrations of Simple Sets—Efficient but easy for the new fans to set up and operate.** A new, inexpensive, single tube hook-up will be given next issue.

**Better than a Super is R. D.-97 to Appear Next Week—This layout may be described roughly as being a single tube reflex circuit using three honeycomb coils, but not as tuning units.**

**Soon Coming—Photo Diagram of the Melco Supreme Receiver—Using the popular Acmedyne circuit.** A different type of set from the usual.

**Newsstands Don't Always  
Have One Left**

**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,  
123 West Madison St.,  
Chicago, Illinois.

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

Name .....

Address .....

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

## RADIO HANDWRITING

(Continued from page 1)  
wolving cylinder and by the play of lights and mirrors, as in the case of transmission of photographs the exact script is sent over the wire. It is much cheaper than the ordinary Radiogram. A flat rate of twenty francs is charged, the number of words being limited only by the size of the writing.

**Sends 1,453 Words for Dollar**  
For instance, in one case a stenographer sent from Lyons to Paris a message of 1,453 words, in shorthand notes, which was written on the cylinder of about the same size as an ordinary telegraph blank. The cost was only one dollar. In this way about one column of a newspaper could be sent for about \$1.25. The system is very fast. The operation of sending the stenographic message from Lyons took only six minutes.

If the telegram had been written in ordinary script and sent by a fast telegrapher it would have required twenty-five minutes at the rate of sixty words a minute, and the cost, at the current rate, would have been about \$16. This method of automatic transmission of telegrams is now open to the public, the necessary apparatus having been installed in the French government telegraph offices of the larger cities. There is no reason why a person could not send his own photograph with an inscription this way.

## WDAR Balks at "Operators' Night" but Permits Dance

PHILADELPHIA.—Station WDAR, Lit Brothers, recently had an "operators' night," the first of its kind in this city, probably in the country. Although the program was to have been put on the air, not one listener in heard the fun, because the transmitter quit "cold" about two hours before the start and stayed that way all night.

Operators and announcers in all the stations here and newspaper Radio editors were invited to participate. It was planned that all of them would speak via Radio. Station WOO, after broadcasting the time signals and weather reports, announced the break-down of WDAR. But everybody enjoyed himself. Mrs. B. F. Marshall was hostess, assisted by A. S. Crooks. After speeches by several of the announcers there was a "Radio dance."

## Positive Radio Helps

For Storage Battery Tubes Use *Eveready Storage "A" Batteries.*

For Dry Cell Tubes Use *Eveready Dry Cell Radio "A" Batteries.*

For all Vacuum Tubes Use *Eveready "B" Batteries.*

# EVEREADY Radio Batteries

—they last longer



# YELLOW TIP MICROMETER ADJUSTING CRYSTAL DETECTOR

Any adjustment made in a moment—fixed instantly! Hold indefinitely, until you wish to change, then—"A Twist of the Wrist—It's Set." Ideal for reflex and other circuits. \$2

Write for folder, and name of your nearest dealer

**Wholesale Radio Equipment Co.**  
Exclusive Factory Representatives  
35 William Street, Newark, N. J.  
Dealers and Jobbers—Write for Attractive Proposition



# WGY OFFERS \$500 FOR RADIO DRAMA

## NEW ART UTILIZES VOICE TO BUILD SCENERY

General Electric, Fostering Novel Theatrics, Encourages Use of Sound Imitating Devices

SCHENECTADY, N. Y.—Station WGY, General Electric Company here, is offering a prize of \$500 for the best Radio drama submitted in competition during the three months' period beginning September 1.

The prize-winning play will be presented by the WGY players during the winter when transmission conditions are best and when perhaps 1,000,000 persons will be listening in. An audience of this size will be equivalent to the attendance at 500 performances of a stage production in a theater seating 2,000 persons. Other plays offered in competition will be produced via the air, if found suitable, and the authors remunerated.

### Public Demands Radio Drama

One year's production of Radio drama by the WGY players has convinced Martin P. Rice, director of broadcasting, that there is a public demand for this type of entertainment and that the peculiar requirements of the Radio drama as compared with that of the stage and the screen will result in a new form of dramatic art. The screen has evolved a distinct type of drama which depends solely on the eye for its appreciation; tomorrow the Radio drama may be so written that the ear and the imagination unaided by the eye may be satisfied. It is to stimulate the development of the Radio drama that the General Electric company has inaugurated the contest.

The author of the Radio drama must place himself in the position of writing for a blind man. The words or lines of the actors must convey a picture of the scene in which the action takes place.

### When Speech Is Scenery

This apparent limitation or handicap becomes an aid to the action, as the writer need not restrict his play to three, four or five scenes. For example, he can depict an automobile race and carry his audience through its exciting phases by means of the lines. He may take his listener from room to room or floor to floor in a dwelling, if farce or melodrama call for such action. The chase, long a popular feature in the early motion pictures, may be brought into the Radio play by means of speech. The spoken word builds the scenery. Dramatic situations may be built by the voice and by sound-making devices. The writer is encouraged to make use of the latter so as to simulate rain, thunder, surf, roar of a moving train, a pistol shot, an airplane, a telegraph key or an automobile motor.

## IT COST HIM \$110 TO LISTEN TO KPO MUSIC

### San Francisco Radiophan Robbed by Fair Hotel Guest

SAN FRANCISCO.—It cost J. W. Phillips \$110 to have a strange but pretty woman share a KPO Radio concert with him in his room in the Ventura hotel here recently, he told the police. Phillips, explaining that he was a Radiophan, installed a receiving set in his room. Shortly after he had tuned in and was intently listening to a musical program broadcast by Hale Brothers, he said he heard a gentle knock at his door.

"Come in!" he called. The door opened, a pretty girl begged pardon, but asked if she could listen in with him. Leaving the door ajar, Phillips told the police, the young woman pressed her head closely to his and shared with him the receiver.

"While listening in she was 'dipping in' to my pockets," said Phillips, "for after she had thanked me and hastened away, I missed \$110 I had in my vest pocket."

## WOC OFFERS PRIZE TO BACK ITS CORN TALE

DAVENPORT, IA.—So that the thousands of listeners in may see proof of the usual announcement of Station WOC of this city that it is "where the West begins" \$50 in prizes will be awarded to boys and girls in Iowa who report and exhibit the tallest stalks of corn.

## SUNDAY'S "DRY" TALK WILL BE SENT BY WGR

BUFFALO, N. Y.—WGR announces the tentative engagement of Billy Sunday during the week of October 15. The Rev. Mr. Sunday is scheduled to speak to the national convention of the W. C. T. U. All of the addresses will be given before microphones of the Federal Telephone and Telegraph Company station.

# CHAIN OF THEATER STATIONS PLANNED

## PLANT IN BOSTON SECOND IN LOEW'S PROJECT

Line of Playhouses Broadcasting Own Feature Acts Part of New Yorker's Scheme

By F. N. Hollingsworth

BOSTON, MASS.—This city is to be the second in a chain of broadcasting stations to be established by Marcus Loew in connection with his chain of vaudeville and motion picture houses across the country. Mr. Loew has already transferred Station WHN from Ridgewood to the Loew State theater building in New York City.

It is planned to extend this service; part of the plan calls for the erection of a similar station in Boston, at the new theater under construction in the former Siegel building, which will be the third Loew theater in Boston.

### Will Broadcast Headliners

It is his intention to broadcast headline acts. Theaters not in the same building with the broadcasting station will be connected by telephone and microphone service with the broadcasting studio. Mr. Loew's finest orchestras will also feature the broadcasting as will celebrities of the stage and screen who will discuss topics of interest to Radiophans.

Station WHN has been heard in all of the eastern states and as far as Dallas, Tex., and Butte, Mont. Mr. Loew plans to increase its range to 2,000 miles.

### Will Help Theater Patronage

Leading theatrical men say that the plan of Marcus Loew points the way for other theatrical men and that it will have a marked effect in raising the plane of Radio programs throughout the country.

Viewed in the light of the results attained by grand opera broadcasting last winter, when many thousands hitherto unfamiliar with grand opera became enthusiasts and many hundreds became patrons, the project of Mr. Loew will undoubtedly result in largely increasing the interest in and direct patronage of theaters.

Room will be reserved in the studio of the Boston theater so that famous orchestras may send their repertoires readily by Radio. Proper acoustics and every detail necessary to successful broadcasting will be provided. The studio will be connected by telephone lines with Station WHN in New York so that any important event in Boston or New York can be broadcast simultaneously from both stations.

## Word from Arctic Ship and Back in 10 Minutes

### Message from Bowdoin's Operator Is Relayed to Mother

WATERBURY, CONN.—Ten minutes was the record time consumed for the sending of a Radio message from Donald B. MacMillan's Arctic-bound schooner, Bowdoin, to Bristol, Conn., via a local amateur station, and the relaying of a reply to the ship somewhere northeast of Labrador on the way to Greenland.

The prophecy that the Radio installation on the Bowdoin could be utilized by members of the crew to communicate with friends and relatives at home, thereby relieving the tedium of Arctic loneliness, has proved true, the feat demonstrating the efficiency of the American amateur traffic system.

The message was a personal greeting from Donald H. Mix, Radio operator with the exploration party, to his mother in Bristol. Communication was established with WNEP, the Bowdoin's Radio, shortly after midnight by Allen C. Lawson here, who immediately called Mrs. Mix by telephone. The reply was soon on its way north; Lawson heard Mix thankfully acknowledge its receipt.

## THEY'LL NICKNAME HIM WGM



"Lasso" Moseley, director-announcer, Station WGM, The Atlanta Constitution, "christening" the two-months-old baby boy of Mr. and Mrs. George F. Pollock, of Atlanta, Georgia. William Grady Moseley, whose initials represent the call letters of "Old Reliable" of the South, was the name given the youngster. Mrs. Pollock is shown "standing by" during the ceremony

## New Station KGB, Built by Operator, Is Opened

### Newspaper Plant in Tacoma Operates Temporarily on 50 Watts

TACOMA.—Station KGB, the new plant of the Tacoma Daily Ledger, one of the most powerful in the northwest, was opened here recently by means of a fine musical program. The station, which was built by Alvin Stenso, chief operator, who also constructed The Ledger's two preceding plants, is designed for facilitating reception by crystal and less powerful tube sets in a wide area. KGB will operate temporarily on 50 watts; it is a 100-watt station.

## WOR AGAIN PRESENTS PLAY FROM BROADWAY

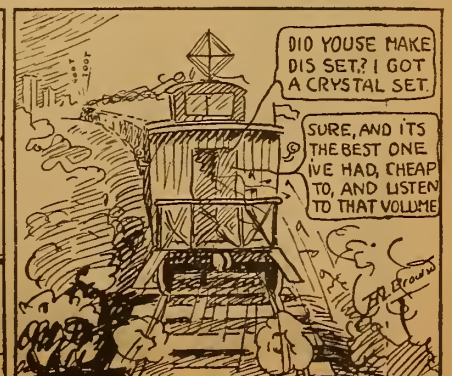
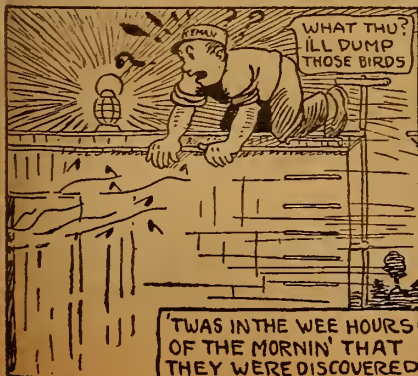
### Writer of "Thrillodrama" Introduces Characters

NEWARK, N. J.—Another Radio matinee of a current Broadway success was staged at Station WOR, L. Bamberger and company, here recently. It was Myron C. Fagen's "thrillodrama," "Thumbs Down" A prologue, especially written, was read by the author, who also described each scene and each character and personally introduced each player to the listeners in. The rise and fall of the curtain was indicated by a gong; there was orchestral music between acts.

## THE ANTENNA BROTHERS

## Spir L. and Lew P.

## Radio Hoboes DeLuxe





# ETHERIC 'BELLHOP' NEW HOTEL DEVICE

## HOSTELRY IN PHILADELPHIA PLANS STATION

"Meesta Hmpmp" Called by Airphone  
—Page One of Several Innovations in Apartment

PHILADELPHIA.—Three new large apartment buildings in this city are making elaborate Radio installations. In the Pennsylvania apartment hotel, which is nearly completed engineers are installing receiving apparatus on the roof, which device will supply Radio programs in the main dining room, banquet hall and grill. The Garden apartments and the Lincoln Drive apartments, the latter of which will be built soon, also plan complete Radio installations. Each apartment in the two structures will be equipped with headphones and loud speakers. Receiving equipment will be placed too in the lobbies and dining halls.

### Will Page by Apparatus

The Lincoln Drive apartment equipment will permit reception from three stations simultaneously; the circuits are designed so that any of three broadcast features can be given to the entire building or to individual tenants as they may choose. It is also planned to establish a small broadcasting station in a room by which orchestral music or the voice of a speaker may be transmitted to all other rooms. Durham and Company, Radio engineers who are installing the apparatus, say it will be the most elaborate ever attempted.

In the Pennsylvania apartments the engineers have connected a novel paging system with the Radio equipment so that the telephone operator may by plugging in a microphone talk to any one or all of the output stations and make what announcements may be necessary. This system will be used also for paging guests.

## New Jersey Radio Makers to Show in Few Weeks

Manufacturers Propose to Work  
with Electrical Firms

NEWARK.—More than thirty Radio manufacturers in New Jersey, who recently formed an organization for the betterment of the industry, known as the Radio Manufacturers' Association of New Jersey, have announced that plans are almost complete for a Radio show, to be held probably the latter part of October or the early part of November, in the 6th Infantry armory, Newark.

They have decided, owing to the fact that Radio is so closely connected with the electrical industry, that electrical firms will be invited to participate in the exhibition.

### Radio Exports Show Gain

WASHINGTON, D. C.—Export shipments of radio apparatus varied widely from month to month during 1922, according to R. A. Lundquist, chief of the electrical equipment division of the department of commerce, who reported recently that a much wider distribution was shown this year by the manner in which the quantity of exports maintained a steady high level. During the first six months of this year the shipments were valued at \$1,209,389.

# FLEWELLING ANSWERS TO QUERIES

By E. T. Flewelling

(Editor's Note.—This department is written by Mr. Flewelling, the inventor of the famous super circuit. From the questions sent him each week care of Radio Digest, he picks the one considered most informative for all and answers it in this column.)

### Dyed in the Wool Radio Men

(Submitted by R. L. B., Denver, Col.)

Question. In my experience with the Flewelling I had great difficulty in obtaining a grid leak that would give the proper control of the circuit. Finally I was able to pick out two that worked. From then on in each set I received tremendous regeneration. Your comparison of dumping a ton of very hard coal is very good. It is all that. But while I can get all the local stations on any antenna or ground or nothing, yet I can do no distant work. Why? We certainly know how to tune our sets but this point seems to be beyond us. Can you help us?

Answer. You chaps are real dyed in the wool, experienced Radio men and above all others should make the Flewelling work, but I'll bet you a baker's cooky that

you are overlooking one point. Here goes—a million persons asked for all the information that we could give them about the circuit. Emphasize the word *all*. That means that we had to tell them about using a tickler for feedback and also about a variometer in the plate circuit. You know as well as I that a tickler means constant regeneration over a greater band of wave length; it is therefore easier to tune with than a plate variometer. Using a plate variometer means that we must operate both tuning elements and variometer together because of the fact that one setting will change the other. We already have a few actions going on in the Flewelling without adding a further complication such as tuning the plate circuit. Let me tell you that if you are using a variometer in the plate circuit of a Flewelling you are at the present development of the set undertaking a man's sized job when you start to tune in a distant station. Do not use a plate variometer but stick to the good old fashioned tickler coil; you will not have much difficulty in tuning in the distant stuff.

# ARMY'S EAR SHOWS ADVANCE, REPORT

Tests on Aviation Field, East,  
Shows Spark Bests Phone  
on Airplane

NEW YORK.—One of the most interesting applications of Radio is found in the modern airplane, according to military experts here. The aviation service is known as the "eye" of the army, but that eye is blind unless it can signal back its observations.

During the last war compact Radio outfits were constructed for plane-to-ground communication, but as there was little time to do experimental work with them, they did not perform as well as desired. Since the war, however, rapid strides have been made on the aviation field of the 102d observation squadron of the New York national guard at New Dorp, Staten Island.

Here are eight airplanes, two of which have been equipped with complete receiving and transmitting apparatus by Lieut. James K. Noble, who is in charge of Radio work.

It has been found that the spark equipment is much more reliable than the phone. There is less to become out of order, and the parts withstand more easily the terrific vibration.

# Steamer Line Orchestras

Give Concerts Over CKAC

MONTREAL.—If Canadian and American Radiophans have heard high-class orchestral programs every Thursday evening this summer they are indebted to the White Star Dominion line, which, in co-operation with Station CKAC, the La Presse of this city made arrangements to broadcast the music of ships' orchestras while in port. These programs will continue until November 8.

# TWO SUPERSENSITIVE CIRCUITS

(Both Copyrighted)

My Highly Improved Reinartz brings in all important stations on both coasts and Mexican border, loud, clear and without distortion. We dance to music from Atlanta received on one loud Baldwin unit. Build one of these wonderful sets from my blueprints and specifications, price 50c, or with a perfect and complete double wound spiderweb coil, \$3.00 by mail. No other windings used. Photo of my set on a glass panel with every order.

This copyrighted circuit is the most successful of any Reinartz modification yet produced, and is imitated the most. Thousands are in use. My W. D. 11 Circuit is especially designed for use with the "Pickle" tube and brings out the full value of that little tube as no other circuit can. Stations 1000 miles away come in clearly on one tube. This set is small, complete, portable. For the man who wishes the highest efficiency, this is the set to build. Price of blueprint and specifications, 50c, or with complete and perfect windings, \$3.00. Photo of set with every order.

Sets built from these plans will receive all broadcasting stations operating under the new laws. Their wave length range is from 170 to 800 meters.

# AUXILIARY TUNER

This new instrument connected to your present receiving set with one wire enables you to easily bring in both the long and short wave stations which you cannot get with your present equipment. It also enables you to eliminate that local interference so you may listen to distant stations.

Copyrighted diagram and complete instructions for building and operating this instrument, 50c, or with all parts, including Condenser, Coils, Switches, and Panel, \$8.50. Complete instrument, \$15. All goods prepaid.

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

S. A. TWICHELL

1925 Western Avenue, Minneapolis, Minn.

# Bunch Your Orders Don't Scatter Them

Dealers who form the good habit of "putting all their eggs in the H-R basket" WIN OUT—save a lot of time, worry, mistakes, delays and money.

We are distributors of the largest and most responsible manufacturers of nationally advertised radio equipment in the U. S. and carry complete stocks, for immediate shipment in any quantity. We have abolished mistakes and delays by our double-check, time-stamp system of handling orders. We represent:

- Atwater-Kent
- Erla
- United Mfg. Co.
- Murdock
- General Radio Corp.
- Carter
- Dubilier
- All American
- Howard
- Federal Tel. & Tel.
- Brands
- Radi-Un Loops
- Baldwin
- Coto Coil
- Tungar Chargers
- Bradleystats
- Univertler
- Eveready B's and A's
- Celeron Panels
- C. R. L.
- Ame
- Hilco

Send for literature and discounts, stating lines on which you wish immediate quotations.

We are the largest exclusive Radio Jobbers in the middle west.

Note: ERLA Bulletin 14 on one, two and three tube REFLEX, FREE for the asking.

**HUDSON-ROSS**  
123 W. Madison St. Chicago

# AIR TELLS STROKES OF GOLF CHAMPION

Various "Plays" of Bobby Jones  
on Long Island Links Are  
Broadcast to Atlanta

ATLANTA.—An odd sidelight on the victory of Bobby Jones as American open golf champion was the Radio reception of the news by scores of his friends and admirers playing on the young amateur's home course in Atlanta.

Dotting the course were refreshment stands, all Radio equipped. While the sensational match was under way, a leased telegraph wire connecting the Inwood Links on Long Island, N. Y., and the Atlanta Journal building, enabled Station WSB to keep a stroke-by-stroke narrative of the battle.

As the news of Jones' victory reached the East Lake stations, it spread over the entire course. A great crowd at the clubhouse surrounded a loud-speaker.

# Zion Opens Another Studio

ZION, ILL.—Zion's second Radio studio was opened recently for broadcasting band and orchestra selections from WCBD. The studio is in the southeast corner of Shiloh tabernacle.



Guarantee an unusually uniform and steady contact. For base or panel mounting. Condensite base, high-grade resistance unit, attractive knob. Adjustable shaft to any thickness panel.

- 6 Ohms.....\$1.00; with dial.....\$1.25
- 20 Ohms.....1.25; with dial.....1.50
- (For UV-201A Tubes)
- 50 Ohms.....1.30; with dial.....1.55
- (For UV-199 Tubes)

At All Good Dealers  
**AMSCO PRODUCTS, INC.**  
Broome & Lafayette Sts., New York City



**RADIO VIA PARCEL POST**  
AT N. Y. PRICES  
Standard Parts Only, in Original Packing  
NO SALVAGED GOODS SOLD  
Where "Money Back Policy Prevails"

PHONES	For Parcel Post	Ins. Add
Dietzen 3,000 Ohm.....	\$3.75	\$0.12
Brands.....	5.75	.14
Dietzgraph.....	5.75	.14
VARIABLE CONDENSERS		
Dietzen 14-Plate Vernier.....	2.65	.14
Dietzen 24-Plate Vernier.....	2.95	.16
Dietzen 46-Plate Vernier.....	3.45	.18
TRANSFORMERS (Audio Frequency)		
Dietzen.....	3.45	.12
Ames 4 1/2 to 1.....	2.95	.12
TRANSFORMERS (Radio Frequency)		
Cotoco.....	2.45	.12
Owl.....	.95	.10
MISCELLANEOUS		
Reinartz Coils.....	1.25	.08
Sta-Put Plug.....	.40	.06
Freshman Grid Leak & Cond. combined.....	.85	.12
Dietzen Single Circuit Jack.....	.40	.06
Aerial Insulators.....	.10	.02
Ritter Portable Loop.....	1.00	.10
Argus Lightning Arrester.....	.95	.09
Welsh Peanut Tube.....	2.00	.08
Peanut Tube Socket.....	.50	.03
Switch Lever, Fada Type.....	.19	.06
Ammeter Testing B Battery.....	.49	.08
Hydrometers.....	.49	.08
Double Phonograph Attachment.....	.95	.08
Cockaday Coil.....	2.25	.14
2 Coil Honeycomb Mounts.....	2.95	.12
Ware Trap.....	4.95	.15
Electric Soldering Iron.....	3.95	.15
100 Feet Copper Antenna Wire.....	.39	.08

RHEOSTATS		
Dietzen, 6 ohm.....	.39	.66
Dietzen, 30 ohm.....	.45	.06

SOCKETS		
Bell V. T. & W. D. 11.....	.89	.10
V. T. Bakelite.....	.50	.10

DIALS		
2-inch.....	.25	.06
3-inch.....	.35	.08
4-inch.....	.49	.08



191 Fulton St., Dept. F-28, New York City  
9 New York Stores  
America's Greatest Radio Mail Order House

# The New Grebe Broadcast Receiver

JOHN JAY ADAMS, of Mount Vernon, N. Y., was at Charleston, Ontario, during July. With his Grebe Broadcast Receiver he enjoyed programs from fifty-three broadcasting stations, including those at Atlanta and College Park, Ga., Memphis, Tenn., Fort Worth, Texas, Omaha, Neb., Chicago, Philadelphia and New York. He reports "absolutely no interference."

Licensed under Armstrong  
U.S. Pat. No. 1,113,149

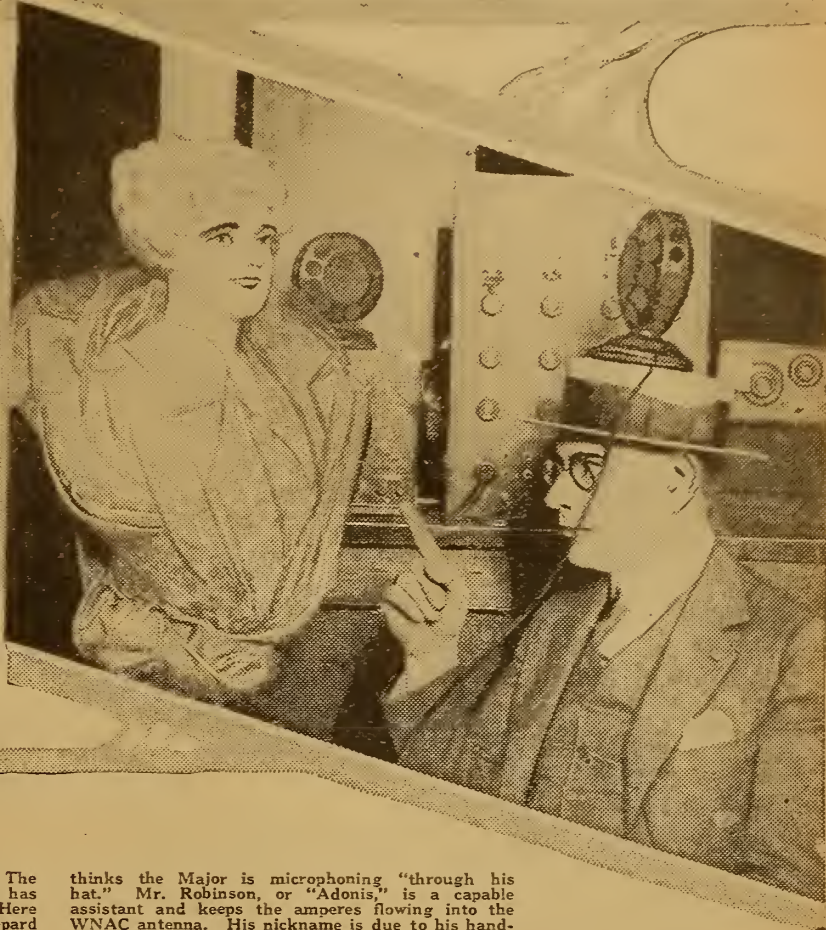
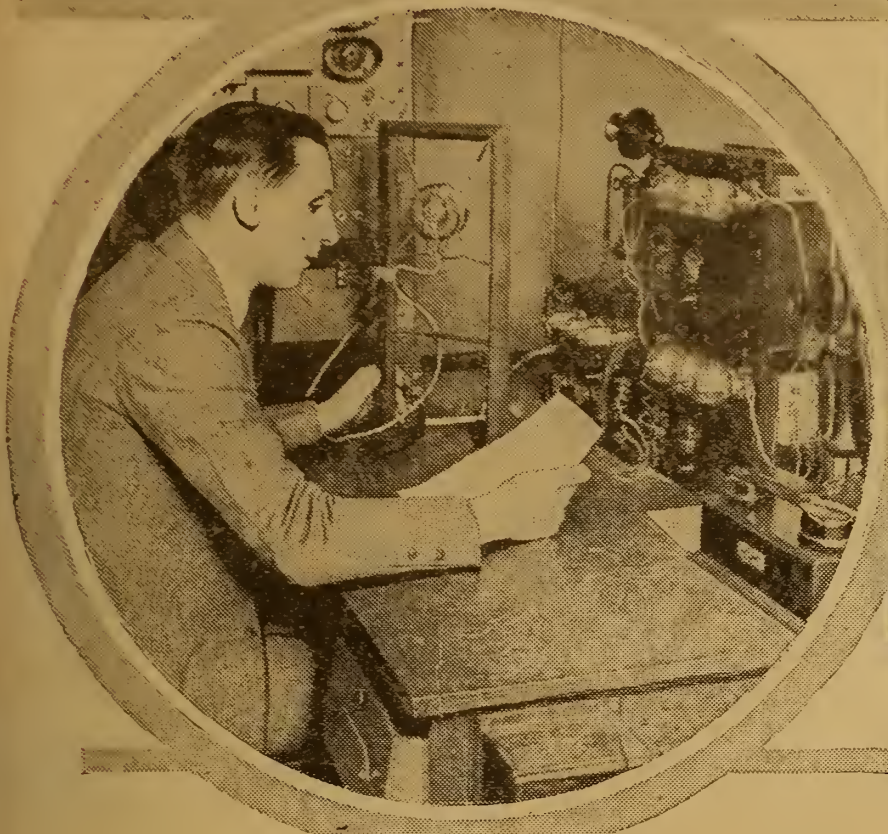
Ask Your Dealer About the  
20-foot Indoor Wire

A. H. GREBE & CO., Inc.  
RICHMOND HILL, N.Y.





# THE MAJOR AND ADONIS OF WNAC



Station WNAC, Shepard Stores, Boston, has long been recognized for the quality of transmission. Its equipment is partly responsible, but to Major John F. Fanning (right), announcer and program director, and Irving B. Robinson (left) operator and assistant

announcer, should go a great deal of credit. The Major, or "JJF" as he is known to listeners, has some very definite ideas about broadcasting. Here he is explaining some of these to one of the Shepard Stores' dummies, who, to judge from her smile,

thinks the Major is microphoning "through his hat." Mr. Robinson, or "Adonis," is a capable assistant and keeps the amperes flowing into the WNAC antenna. His nickname is due to his handsomeness and marriageability

© K. & H.

## Most Popular Voice on Air in East Is Major J. J. Fanning's, of WNAC

By F. N. Hollingsworth

BOSTON, MASS.—Probably the best known and most popular voice in the East is that of Major John J. Fanning, director of broadcasting at WNAC, The Shepard Stores station here, and heard by thousands of admirers of Radio concerts as "JJF."

As director of broadcasting since the establishing of Station WNAC last year, it became Director Fanning's duty to announce the Radio programs daily. From the very first day, when a telephone call was received by Mr. Shepard from a woman in Chelsea asking the name of the announcer with the wonderful voice, men, women and children continue to call him up, write him letters and send picture postcards, requesting his photograph and telling him complimentary things about his voice.

### Voice Liked by All

Should he ever lose that remarkable voice—deep, rich and resonant—it would be a hard blow to WNAC, as well as to thousands of Radiophans. It is necessary for him to employ a private secretary to read and answer his mail and to tell the writers who he is. It is not alone the quality of his voice, but that quiet, unassuming attitude in his announcements that has made him so popular with the great unseen audiences of the East. And personally to meet, he is just as unassuming and quiet as his voice over the Radio would indicate. He impresses one, however, as having a great reserve of forcefulness and as one who would be quick and decisive in action should occasion require.

### Arranges WNAC Programs

As director of broadcasting it devolves upon Major Fanning to make up the programs for WNAC from day to day and far in advance. It is to him in a large measure that thanks should be extended by Radiophans for some of the wonderful programs they have heard from Station WNAC, including several nights of grand opera, and for some of the remarkable "stunts" that have been sprung from time to time.

The latest feature added to WNAC's programs is announcements of the results of some of the big boxing events that have taken place lately, including the Dempsey-Gibbons battle and others. A news ticker, connecting directly with the ringside of every important "scrap," has been installed in the announcer's studio, and as the returns come in, together with other ticker news, it is announced to Radiophans who otherwise would have to call up some distant telephone station or wait for the morning papers.

### Wide Army Experience

Major Fanning is a native of Boston and a graduate of Boston schools. He served in the Signal Corps of the Massachusetts National Guard from 1907 until the outbreak of the world war, this period including a term on the Mexican border as sergeant of the Radio company. In May, 1917, he was commissioned a first lieutenant in the Signal Corps, a month later promoted to captain, and then transferred to the Signal Corps of the regular army. In January, 1918, he was again promoted to major in the regular army.

Major Fanning commanded the 301st Field Signal Battalion during its entire existence, first for a year in America and for another year overseas as part of the first and second American armies and the army of occupation. He is at present commanding officer of the 301st Signal Battalion, 21st Army Corps, U. S. Army, with the rank of major in the Signal Reserve Corps.

For ten years he has been active in Radio. He is married, so those of the feminine fans who admire his voice will have to be content with that.

### Second Announcer Eligible Catch

Irving B. Robinson is assistant broadcasting operator and announcer for WNAC. He is just twenty-four years old, girls, a likable chap, with a good announcing voice and a fine war record. He was born in Attleboro, Mass., and his father, Dr. H. S. Robinson, is one of the best known Radio amateurs in the country. When Irving was old enough to pound a key he was at the set, sending and receiving, in communication with his boy friends and his father's older amateur friends.

Young Robinson was one of a party which installed a Radio communication service in the gold camps near the South Porcupine, Africa, district. He has traveled all over the world, even at one time joining a party of gold prospectors on a trip to Labrador. He has also acted as a superior claim agent, settling some important cases.

Besides his liking for Radio, which seems to be now his life work, he has quite a hobby for amateur theatricals and has taken prominent parts in many shows, displaying no mean ability.

And girls! He is unmarried! They call him "Adonis" Robinson.

Radio communication is rapidly being adopted by Western power companies as a means of maintaining communication with their distant power plants when wire lines are inoperative.

## AN EVENING AT HOME WITH THE LISTENER IN

Station and City	Met.	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
CFCA Toronto, Ont.	400	6:00-7:00	5:00-7:00	6:00-7:00	6:00-7:00	6:00-7:00	6:00-7:00	6:45-7:45
CFCN, Calgary, Alta.	440	10:00-11:00				11:30-1:30	11:00-1:00	
CKAC, Montreal, Que.	430	5:00-9:00	6:00-9:00		6:00-9:00		6:00-9:00	3:00-4:30
KDKA, E. Pittsburgh, Pa.	326	9:00-10:00	9:00-10:00	5:00-9:00	5:00-9:00	5:00-9:00	5:00-9:00	6:30-7:30
KFAF, Denver, Colo.	360	8:45-1:00	8:45-1:00	8:45-2:00	8:45-1:00	8:45-2:00	8:45-2:00	10:00-1:00
KFL, Los Angeles, Calif.	469	8:45-12:00	8:45-12:00	8:45-12:00	8:45-12:00	8:45-12:00	8:45-12:00	10:00-12:00
KGW, Portland, Ore.	492	9:30-2:00	12:00-1:00	10:00-11:00	12:00-1:00	9:00-2:00	12:00-1:00	9:00-10:00
KHJ, Los Angeles, Calif.	395	8:45-12:00	8:45-12:00	8:45-12:00	8:45-12:00	8:45-12:00	8:45-12:00	10:00-12:00
KPO, San Francisco, Calif.	423	10:00-12:00	10:00-12:00		10:00-12:00		10:00-2:00	10:00-12:00
KSD, St. Louis, Mo.	546	8:00-10:00	8:00-10:00	8:00-10:00		8:00-10:00	8:00-10:00	
KYW, Chicago, Ill.	345		7:00-9:00	7:00-9:00	7:00-9:00	7:00-9:00	7:00-9:00	6:00-7:00
NAA, Radio, Va.	435	5:45-7:20	6:05-7:20	6:25-8:40	5:45-7:40	7:00-7:40		
PWX, Havana, Cuba.	400			8:00-10:30			8:00-10:30	
WBAP, Fort Worth, Texas.	476	9:30-10:30	9:30-10:30	9:30-10:30	9:30-10:30	9:30-10:30	7:00-7:30	7:30-8:00
WBZ, Springfield, Mass.	337	5:00-8:00	6:30-8:00	5:00-8:00	6:30-8:00	5:00-8:00	6:30-8:00	7:00-8:00
WCX, Detroit, Mich.	517	7:00-10:00	7:00-12:00	7:00-10:00	7:00-10:00	7:00-10:00	7:00-10:00	4:00-5:00
WDAF, Kansas City, Mo.	411	6:00-1:00	6:00-1:00	6:00-1:00	6:00-1:00	6:00-1:00	6:00-1:00	11:45-1:00
WDAJ, College Park, Ga.	258	7:30-11:30	7:30-11:30	10:30-11:30	7:30-11:30	7:30-11:30	7:30-11:30	7:30-11:30
WDAP, Chicago, Ill.	360		9:00-1:00		9:00-1:00		9:00-1:00	8:00-11:00
WDAR, Philadelphia, Pa.	395	5:30-6:00	5:30-8:00	5:30-9:00	5:30-6:00	6:00-1:00	6:30-6:00	
WDT, New York, N. Y.	405			5:00-5:50		9:00-10:00		
WEAF, New York, N. Y.	492		5:30-6:00	5:30-8:00	5:30-8:00	5:30-6:00	5:30-8:00	9:30-11:00
WEAA, Dallas, Tex.	476	8:30-9:30	8:30-12:00		8:30-9:30	8:30-9:30	8:30-12:00	
WFI, Philadelphia, Pa.	395	5:00-5:30	5:00-7:00	5:00-9:30	5:00-7:00	5:00-5:30		5:30-6:30
WGI, Medford, Mass.	360		6:30-8:00	6:30-8:00	6:30-8:00	6:30-8:00	6:30-8:00	6:30-10:00
WGM, Atlanta, Ga.	429	9:30-10:30	9:30-10:30	12:00-1:00	9:30-10:30	6:00-8:00	9:30-10:30	7:30-8:00
WGR, Buffalo, N. Y.	319	6:00-8:00		6:00-8:00				
WGY, Schenectady, N. Y.	380	6:45-9:00	6:45-9:00		6:45-9:00	6:45-11:00		5:30-6:30
WHA, Madison, Wis.	360	7:30-8:30		7:30-8:30		7:30-8:30		
WHAS, Louisville, Ky.	400		7:30-9:00	7:30-9:00	7:30-9:00	7:30-9:00	7:30-9:00	
WHAZ, Troy, N. Y.	380	8:00-9:30						
WHB, Kansas City, Mo.	411		8:00-10:00		8:00-10:00			8:00-10:00
WHK, Cleveland, O.	360	5:00-5:30	5:00-5:30	7:00-8:55	5:00-5:30	5:00-5:30	5:00-5:30	7:00-8:55
WIP, Philadelphia, Pa.	509	4:00-5:30	5:00-10:00	5:00-5:30	5:00-8:00	5:00-5:30	6:00-10:00	
WJAX, Cleveland O.	390		6:30-8:30					
WJAZ, Chicago, Ill.	448		9:00-1:00	9:00-1:00	9:00-1:00	9:00-1:00	9:00-1:00	5:00-8:00
WJY, New York, N. Y.	405				5:30-9:30	5:30-9:30		1:15-4:00
WJZ, New York, N. Y.	455	5:30-9:30	5:30-9:30	5:30-9:30	6:30-9:30	5:30-9:30	5:30-9:30	6:30-8:30
WKAQ, San Juan, P. R.	360		9:25-10:55					
WLAG, Minneapolis, Minn.	417	6:30-10:30	6:30-10:30		5:30-10:30	6:30-10:30	6:30-10:30	7:30-8:30
WLW, Cincinnati, O.	309	7:00-9:00	9:00-11:00	7:00-9:00	9:00-11:00			
WMAQ, Chicago, Ill.	448		6:00-9:00	6:00-9:00	6:00-9:00	6:00-9:00	6:00-9:00	
WMC, Memphis, Tenn.	500	8:00-9:30	8:00-12:00		8:00-9:30	8:00-12:00	8:00-9:30	
WMAI, San Antonio, Texas.	395		8:00-10:30		7:30-8:30			9:30-10:30
WQAW, Omaha, Neb.	424	9:00-10:00	9:00-10:00		9:00-10:00		9:00-10:00	9:00-10:00
WOC, Davenport, Ia.	596	7:00-8:30			7:00-8:30	7:00-8:30	9:30-10:30	7:00-9:00
WOO, Philadelphia, Pa.	509	5:45-9:00		10:00-11:00	7:00-8:30	5:45-9:00		
WOR, Newark, N. J.	405	6:00-10:00	5:15-6:30	6:00-9:00	5:15-6:30	5:15-6:30	6:00-9:00	
WOS, Jefferson City, Mo.	441	8:00-9:30		8:00-9:30		8:00-9:30		
WSAI, Cincinnati, O.	309		7:00-9:00		7:00-9:00		9:00-11:00	
WSB, Atlanta, Ga.	429	8:00-12:00	8:00-12:00	8:00-12:00	8:00-12:00	8:00-12:00	8:00-12:00	7:30-9:15
WSY, Birmingham, Ala.	360	8:00-8:45		8:00-8:45		8:00-8:45		7:30-8:30
WWJ, Detroit, Mich.	517	6:00-7:30	6:00-7:30	6:00-7:30	6:00-7:30	6:00-7:30		4:30-5:30

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. If in addition your city is using Daylight Saving Time, add one hour to this result.

## "Airphone Helps Us to Be Good" Hobo Pens to WGY

SCHENECTADY, N. Y.—Radio has invaded the twilight camps of the hobo. As these adventurers of the road and open spaces gather around their fires they may hear bedtime stories, stock reports, weather forecasts, music and drama.

A recent correspondent of WGY, station of the General Electric company here, who signed himself "A Wanderer for Twenty

Years," said that he always carried some sort of receiving set with him.

"I have been to hell and back in my young life," he wrote, "and have associated with business men, millionaires, ordinary folks and crooks." In his concluding paragraph the wanderer said: "Last Sunday's sermon entered through my set into a bootleg joint, and I'm sure it did some good."

Denmark is discussing the erection of a Radio station in Greenland.



# DISCORD HOLDS UP EUROPEAN STATIONS

## EUROPE'S AIR TELEPHONY BOUNDARY BLOCKED

### Observers in Washington Say Broadcasting Used for Propaganda Obstructs Its Development

WASHINGTON.—What prevents European countries from progressing as far and fast in Radio broadcasting service as the United States?

The answer, as given here by observers recently, lies in the discord prevailing over the eastern hemisphere.

There is no doubt that officially Radio is utilized to its highest efficiency, so far as present engineering can take it, in Europe. The British government has been erecting the greatest worldwide chain of powerful Radio stations.

#### Even Russia Advances

Three stations in France are among the most powerful in the world. Italy, Germany, the Scandinavian countries—even Russia—have also developed their Radio facilities to the nth degree, but only for official government purposes. The layman, who in the United States is enjoying broadcast services from all parts of the land, is strictly limited abroad as to such entertainment. If he can afford to pay a high tax, a high price for his set and a high annual fee for the broadcast services, he may at times be permitted to operate a receiving set.

The reason for these extra duties and high prices lies to the greatest extent in the existent troublesome situation in Europe.

#### Fear Causes Limitations

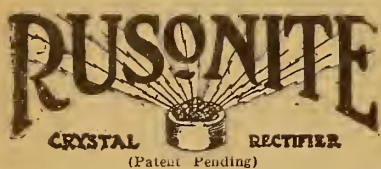
There is international fear among the countries. Jealousy and hatred clog the minds of the diplomats and other government officials. And these are conveyed to the people.

Imagine a broadcasting station with power to transmit speech beyond the boundaries of its own country. Then imagine Radio as popular socially in these European countries as it is here—no government tax, comparatively low price of material and free broadcasting service.

Propaganda would fly through the air in all directions. One country would send its propaganda into all the surrounding territories in languages. And there would be no way of preventing the reception of such propaganda.

That is why ownership even of receiving sets is under strict government control. Until that fear is foregone, Radio reception and broadcasting will remain under strict control—even in England.

Missouri was the first farming State to erect Radio broadcasting stations for market reports.



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

14 K. GOLD SUPERSENSITIVE RUSONITE CATWHISKER. Permanent. Will Not Oxidize. Price..... 25c

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## Reviews of Books

**An Introduction to Radio.** A real book for the amateur. This treatise comes in two volumes. 96 pages in each volume, fully illustrated with flexible leather covers. Price two volumes, \$1.

**How to Retail Radio.** A new book telling of tested plans and methods and policies for the dealer in Radio. Financing, location, store equipment and arrangement. Price, \$2.00.

**Vacuum Tube Receivers.** By O. F. Hessler. A book that tells how to make a simple set. How to make the cabinet. It includes a 27 by 36-inch layout blueprint. Price, 75 cents.

**The Armstrong Super-Regenerative Circuit.** By George J. Eltz, Jr., E. E. This is a De Luxe edition of this famous circuit. Profusely illustrated and fully explained. Fifty-two pages. Price, \$1.00.

**Home Radio—How to Make It.** By A. Hyatt Verrill. This book is particularly adapted for the amateur who desires to know how to make Radiophones. Twelve full page illustrations and diagrams. Price, 75 cents.

**Elements of Radiotelegraphy.** By Elery W. Stone. The text was written for the guidance and instruction of Radio students in the communication service of the Navy. It is an instruction book for Radio schools. Price, \$2.50.

**Radio for the Amateur.** By A. H. Packer and R. R. Haugh. The underlying principles of Radio thoroughly explained in simple language and understandable illustrations. This book will teach you how to construct and operate a receiving set successfully. Price, \$1.50.

**Radio Reception.** By Harry J. Marx, Technical Editor Radio Digest Illustrated, and Adrian Van Muffling. A simple treatise on Radio reception. Beginning with the elementary principles of electricity it carries the reader on into the essentials of Radio telephony. The most successful methods of Radio reception are explained and special reference given to practical tuning. 230 pages, with 130 illustrations. Price, \$2.00.

The book department of the Radio Digest is prepared to send you any of the books on Radio published, whether listed in our Book Review or not. Let us know what book you want, send us your check and we will see that the book is mailed to you. Postage stamps in payment for books not accepted. Send money order or check. Radio Book Department, Radio Digest, 123 W. Madison St., Chicago, Ill.

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The remarkable features which are making this circuit (4 circuit tuner) more popular each day are its simplicity of construction and control—wonderful selectivity—distance records—clearness and loudness of reception, and the fact that all capacity squealing, interference, etc., are eliminated.

Made as per specifications of Mr. Cockaday, using No. 18 wire with D coil bank-wound.

COMPLETE ASSEMBLED SET OF B, C AND D COILS. \$275 PRICE

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

Mail Orders Filled. Dealers Communicate

EASTERN RADIO MFG. CO.

22 Warren Street, Dept. R. D., NEW YORK, N. Y.

# FOG SIGNAL BY AIR SEEN AS SHIPS' AID

## U. S. EXPERT FORECASTS GREATER USE AT SEA

### American Methods of Protecting Marine by Airphone Studied by Several European Lands

By Carl H. Butman

WASHINGTON.—Radio within the next few years will play an increasingly important part in the work of protecting those who go down to the sea in ships, according to George R. Putnam, commissioner of lighthouses.

As a result of his experience with Radio in the lighthouse service, Commissioner Putnam is an enthusiastic supporter of that means of communication. He expressed his opinions strongly at the recent International Congress of Navigation in London, when he asserted his belief that Radio fog signals were destined to become one of the prime factors in life-saving work. Since his return to Washington he has plunged into plans for extending the use of Radio in the lighthouse service.

#### U. S. Leads World

Although not the first country to install Radio fog signals, France having done so several years before this country took the matter up, the United States today leads the world in the number and efficiency of such signals and its methods are studied abroad. The American Radio fog signals are sent out on a 1,000-meter wave length. Those of France were sent on a very low wave length and lacked efficiency; the French government is remodeling all sets so as to use the internationally adopted wave length of 1,000 meters.

Radio fog signals, as their name implies, are sent in foggy weather to warn mariners that they are near dangerous coasts. They have an all-weather range of about thirty miles, but this range can be extended if greater distance is deemed desirable. The sets are automatic, needing only to be started, and are cared for by light keepers and others; knowledge of Radio is not required.

## The Reader's View

### Flewelling Super Bouquet

Some time ago I wrote you about making the Flewelling Super. I constructed the set from the Radio Digest book (using three .006 mfd. condensers). When I had made the super the body capacity effect was very bad.

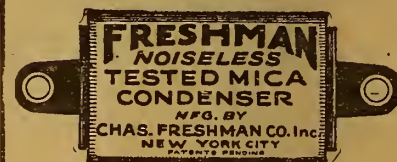
Well, I decided on the first prize set and it certainly eliminated the body capacity. With an outside aerial 60 feet long and 40-foot lead-in I receive all New York stations like wild fire, and very loud. I picked up WOC, Davenport, WDAP, Chicago, and WGY, Schenectady, the first night.

Now I have a 25-foot piece of parallel cord along the picture moulding, and all New York stations come in fine. I also pick up WGY and WDAP on it. I am using a 50 and 75-turn duo-lateral coil, and a WD-11 tube with 45 volts on the plate.

I want to thank you for your letter which indeed shows there is one Radio publication that really does help one when advice is needed. I look for Radio Digest every Tuesday and would not be without it.—Thos. H. Hughes, New York, N. Y.

Radio microphones, loud speakers and vacuum-tube amplifiers are now used in directing vast crowds and mob scenes in moving-picture spectacles.

## The Condenser Sensation of Modern Radio



Through the accuracy and dependability of Freshman Condensers, hook-ups and circuits have been perfected which have completely revolutionized the art of Radio Reception.

These little Storers of energy and rectifiers of Radio Current are the very heart of a well-built radio set.

The proper fixed condenser will make all the difference in the world in the reception, clarity and selectivity your set affords.

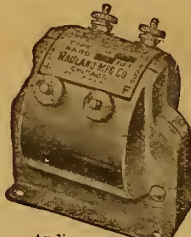
Capacity	Each	Capacity	Each
.0015	\$.35	.002	\$.40
.0025	.35	.0025	.50
.0035	.35	.003	.60
.0045	.35	.004	.75
.0055	.35	.005	.75
.0065	.35	.006	.75
.0075	.35	.008	1.00
.0085	.40	.01	1.00
.0095	.40	.015	1.50
.0105	.40	.02	2.00
.0115	.40	.025	2.50

The FRESHMAN is so designed that constant equal pressure is exerted on the condenser plates over the entire area. They are the only condensers that do this and therefore the only condensers that avoid noises, which are due to variable pressure on the plates.

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Point No. 2 A FOUR-TUBE RECEIVER in which you may use all kinds of tubes—in any desired combination.

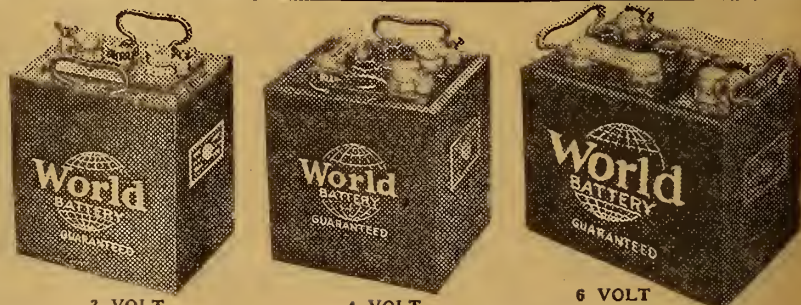
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# The Week's Advance Broadcast Programs

## Tuesday, September 4

**CFCA (Eastern, Daylight Saving, 400), 8:00-9:00 P. M.**, Selection from "Tannhauser," Star Concert Orchestra; Songs by Sydney Walsh, tenor; "Shadow," land," Star Concert Orchestra; "Hundo Chant," Manno, violinist; "Valse Bluette," "The Indian Love Lyrics," Star Concert Orchestra; "Chanson Arabe," Harry Adaskin, violinist; "Grand March," Star Concert Orchestra.

**KDKA (Eastern, 326), 11:30 A. M.**, Music, victrola, S. Hamilton Co.; 5:15 P. M., Dinner concert, Grand Symphony Orchestra; 6:45, Children's Period; 7:20, Concert, Trio of the KDKA Little Symphony Orchestra.

**KGW (Pacific, 492), 3:30-4:00 P. M.**, Woman's program, talk by Jeanette P. Cramer, editor of The Oregonian; 10:10-11:00, Dance music, George Olsen and orchestra.

**KHJ (Pacific, 395), 12:30-1:15 P. M.**, Concert; 2:30-3:30, Matinee musicale, Major and Orchestra; 6:45-7:30, Children's Hour, Wesley Peterson, flutist, age 9 years; Story by "Uncle John," 8:00-10:00, De Luxe Program.

**KSD (Central, 546), 8:00 P. M.**, Concert, Chevrolet Motors Band of St. Louis, Dr. J. M. Black, director.

**KYW (Central, 345), 1:35-2:00 P. M.**, Concert, Lyon & Healy Concert Dept.; 5:50, Children's bedtime story; 7:00-7:58, Musical program, Mark S. Love, bass; Howard Neumiller, accompanist; Evelyn Freedman, violinist; Mrs. D. D. Sells, accompanist; Isham Jones and his orchestra; 8:05, Book reviews, Llewellyn Jones.

**WBZ (Eastern, Daylight Saving, 337), 7:30 P. M.**, Bedtime story for children; 8:00, Concert, Anna Willman, soprano; Mrs. Dorothy Birchard Mulrooney, accompanist; Italo Bisesti, violinist; 9:00, Bedtime story for grownups, Orison S. Marden.

## Wednesday, September 5

**CFCA (Eastern, Daylight Saving, 400), 8:00-9:00 P. M.**, "Merrie England," Star Concert Orchestra; Eileen Law, contralto; "Sonata," Jacques Stern, cellist; "Orientale," Spanish Dances, Star Concert Orchestra; "Rondo," Jacques Stern, cellist; "June Love," Star Concert Orchestra.

## Thursday, September 6

**CFCA (Eastern, Daylight Saving, 400), 8:00-9:00 P. M.**, "Kammmol Ostrow," Star Concert Orchestra; "Come to the Fair," Kate Jackson, contralto; "Vivienne," Star Concert Orchestra; "Elli, Elli," Harry Adaskin, violinist; "My Dreams," Star Concert Orchestra; "Down to the Burn," Kate Jackson, contralto; "Gold and Silver," Star Concert Orchestra; "Canzonetta," Harry Adaskin, violinist; "The Slave Song," Kate Jackson, contralto; "Dreaming," Star Concert Orchestra.

**KDKA (Eastern, 326), 11:30 A. M.**, Music, victrola, S. Hamilton Co.; 5:15 P. M., Dinner concert, Grand Symphony Orchestra; 6:45, Children's Period; 7:20, Concert, Carlouo Brothers Instrumental Quintet; Laura Staska, soprano.

**KGW (Pacific, 492), 3:30-4:00 P. M.**, Child training program; 10:10-11:00, Dance music, George Olsen and orchestra.

**KHJ (Pacific, 395), 12:30-1:15 P. M.**, Concert Program; 2:30-3:30, Matinee Musicale; 6:45-7:30, Children's Hour, "Uncle John"; 8:00-10:00, De Luxe Program; Charles Wakfield, Cadman, and Harry James Beardley; "Main Street," Rev. Thomas Lutman, lecturer.

**KYW (Central, 345), 5:50 P. M.**, Children's bedtime story; 7:00-7:58 P. M., "Musical program, Elyn Swanson Engel, contralto; Sylvia Jackson Hultberg, accompanist; John Stamford, tenor; Sallie Menkes, accompanist; G. A. Bruno, French horn; Joseph Izzo, flutist; Herbie Mintz, pianist.

**WBZ (Eastern, Daylight Saving, 337), 7:30 P. M.**, Bedtime story for children; 8:00, Concert, Margaret Regal, soprano; Willard Clark, baritone; Francis Regal, cellist; Mrs. Francis Regal, accompanist; 9:00, Bedtime story for grownups, Orison S. Marden.

**WDAR (Eastern, Daylight Saving, 395), 12:00-12:54 P. M.**, Organ recital, Stanley Theater; Dinner music, Arcadia Cafe Concert Orchestra; 2:00-3:00, Musical program, Arcadia Cafe Concert Orchestra; 4:30-5:55, "Affairs of the Heart," Betsy Logan; Song recital; 7:30-8:00, Bedtime stories, Dream Daddy.

**WDT (Eastern, Daylight Saving, 405), 12:00-12:55 P. M.**, "T've Got The Yes We Have No, Bananas Blues," "Last Night on the Back Porch," "Somebody Else Took You Out of My Arms," "Oh Min," "Mammys Silver Lining," "The Gold Diggers," "Annabelle," "Stingo, Stango," "Underneath the Slip Slip Slippi Moon," Fred Whitehouse and Jack Stanley, soloists; Comedy Recitations, Fred Whitehouse; "Where The Sacramento River Flows," "Susan," "Hawallah Nightingale," Jack Stanley, pianist.

**WFI (Eastern, Daylight Saving, 395), 1:00-2:00 P. M.**, Dinner dance music, Meyer Davis Bellevue Stratford Concert Orchestra; 3:00, Musical program; 7:00-7:50, Children's Own Half Hour, Stories by Cousin Sue; 8:00, Boy Scouts Radio Corps, supervision of Boy Scouts of America; 8:30, Piano recital; 10:30, Dance music, Meyer Davis Bellevue Stratford Concert Orchestra.

**WGR (Eastern, Daylight Saving, 360), 12:00-12:30 P. M.**, George Albert Bouchard, organist; 6:30-7:00, George Albert Bouchard, organist; 7:00, Digest of the Day's News, topics of scientific interest.

**WJ (Eastern, 360), 1:00 P. M.**, Music and reading, Mrs. Katherine Steers; 7:45, "Peg O' My Heart," drama; Cast: Ruth Bentley, Edward H. Smith, Rose Cohn, W. H. Ward, Jerome Lovenheim, Chas. Baumls, Frances Ford, Earle Harvey, Arliue Montgomery; Orchestral selection, "Irish Rhapsody."

**WHAS (Central, 400), 4:00-5:00 P. M.**, Concert by the Mary Anderson Theatre Orchestra; Ollie Jones, conductor; Organ selections, Roy C. Parks; 7:30, 9:00, Concert by Ray Pfaff and his orchestra; Reading, "An Interesting Historical Episode."

**WIP (Eastern, Daylight Saving, 509), 1:00-2:00 P. M.**, Organ recital, Karl Bonawitz, Germantown Theater; 3:00, Piano recital; 6:00, Dinner music, Dick Regan and his WIP Little Symphony orchestra; 7:00-7:50, Bedtime stories, Uncle Wip; 8:30, Organ recital, Karl Bonawitz.

**WIAX (Eastern, 390), 7:30 P. M.**, Concert, Cleveland News-Leader, Emerson Gill Orchestra, program of popular dance music; Dorothy Maskell, Miss Edith Cannon, Miss Rose S. Seton, vocal solos and trios.

**WIJ (Central, Daylight Saving, 447), 10:00 P. M.**, 2:00 A. M., Musical program selections Oriole Orchestra, Dan Russo, director, Ted Firolo, coach; Jane Holter, soprano; F. Lelloy, pianist; Russell Loug-meyer, baritone.

**WLW (Eastern, 309), 10:00 P. M.**, Selections by the Oriole Orchestra; "One Fine Day," "For You Alone," "Life," "Carry Me Back to Ole Virginia," "Spirit Flower," "Love Sends a Little Gift of Roses," "Love's Old Sweet Song," Idella Banker, soprano; One-Act Play, "The Lollard," Olive Vail, An Old Maid; Dorothy E. Hecker, The Young Married Woman; "She Got That Too," "Steering for Erin," "Missing," "Old Fashioned Days," Oriole Orchestra.

**WMAQ (Central, Daylight Saving, 447), 9:00 P. M.**, La Salle roof garden orchestra, E. E. Sheetz, Jr., Conductor; 9:15, Program arranged by Corydon Smith.

**WOC (Central, 484), 12:00 noon, Chimes concert; 3:30 P. M.**, Educational program, A. G. Hinrichs lecturer; 5:45, Chimes concert.

**WOO (Eastern, Daylight Saving, 509), 11:00-11:30 P. M.**, Organ recital, Mary E. Vogt; 12:00-12:55 P. M., Luncheon Music, Wanamaker Tea Room Orchestra; 4:45-5:00, Organ recital, Mary E. Vogt; 7:30.

**WWJ (Eastern, 517), 9:45 A. M.**, "Irving Day," program, Fred Shaw, pianist and soloist; Margery Richmond, pianist; 12:00 P. M., Detroit News Orchestra; 7:00, Detroit News Orchestra; the Town Crier; G. P. Pitson, tenor; F. W. Durkee, tenor; Bertha Cavanagh, soprano.

## What Time Is It?



Pacific Mountain or Pacific Daylight Saving Central or Mountain Daylight Saving Eastern or Central Daylight Saving Eastern Daylight Saving

THE above clock dials are shown to clear up the misunderstanding which the various time bands and the Daylight Saving plan are creating. Although each dial registers time one hour ahead or behind of its neighbor, the exact period indicated on each dial is the same as that on every other. This chart will aid in the use of the advance programs and the schedules in the Radiophone Broadcasting Station Directory, both of which give the hours stated in the particular kind of time in use at each station. Only features are listed in the advance programs below. Much additional data and such parts of station schedules as are regular features week in and week out, will be found in the station directory which appears serially continuously on page eight.

**KDKA (Eastern, 326), 11:30 A. M.**, Music, victrola, S. Hamilton Co.; 5:15 P. M., Dinner concert, KDKA Little Symphony Orchestra; Victor Saudek, director; 6:35, Literary program, Marjory Stewart; 6:45, Children's period; 7:20, Concert, KDKA Little Symphony Orchestra.

**KGW (Pacific, 492), 3:30-4:00 P. M.**, Children's program, story for tiny tots by Aunt Nell; 8:00-9:00, Helen Van Houten, pianist; 10:00-11:00, Dance music, George Olsen and orchestra.

**KHJ (Pacific, 395), 12:30-1:15 P. M.**, Musical features; 2:30-3:30, Matinee Musicale; 6:45-7:30, Children's Hour, "Uncle John"; 8:00-10:00, De Luxe Program, Mrs. A. F. Borden, director.

**KSD (Central, 546), 8:00 P. M.**, Concert, Edwardsville Concert Band, Joseph A. Raffaele bandmaster.

**KYW (Central, 345), 5:50 P. M.**, Children's bedtime story; 7:00-7:58 P. M., Musical program, Harry Geise, pianist; Sallie Menkes, pianist; Isham Jones and his orchestra.

**WBZ (Eastern, Daylight Saving, 337), 6:00 P. M.**, Dinner concert, WBZ Trio; 7:30, Bedtime story for children; 8:00, Concert, Walter Marsh, baritone; Mrs. Eleanor Turner Lazizzera, accompanist; WBZ Trio; 9:00, Bedtime story for grownups, Orison S. Marden.

**WDAR (Eastern, Daylight Saving, 395), 12:00-12:54 P. M.**, Organ recital, Stanley Theater; Dinner music, Arcadia Cafe Concert Orchestra; 2:00-3:00, Musical program; 4:30-6:30, Fashion Talk and piano recital; 7:30-8:00, Bedtime stories, Dream Daddy; 8:00, Song recital and dance music.

**WDT (Eastern, Daylight Saving, 405), 7:00-8:00 P. M.**, "La Colomba," "Mattinata," "Two Roses," "Bargarola Nocturna," "Love is a Song," "Chanson De Le Lune," "Si Mes Vets Avaient," "Villanelle," Louise Dorr, soprano; "Ah Moon of My Delight," "It Was a Lover and His Lass," "Who Is Sylvia," "Sultima Cenzone," "The Garland," "Elegie," "So We'll Go No More a Rovins," "Now Sleeps the Crimson Petal," "Thank God for a Garden," William Dawson, tenor.

**WFI (Eastern, Daylight Saving, 395), 1:00-2:00 P. M.**, Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 3:00, Song recital; 6:30, Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 7:00, Children's Own Half Hour, Stories by Cousin Sue.

**WGR (Eastern, Daylight Saving, 360), 12:00-12:30 P. M.**, George Albert Bouchard, organist; 6:30-7:00, George Albert Bouchard, organist; 7:00, Digest of the Day's News; 9:00, Concert, American Artists' Club, direction, A. A. Van De Mark.

**WHAS (Central, 400), 4:00-5:00 P. M.**, Concert by the Mary Anderson Theatre Orchestra; Ollie Jones, conductor; Selections on the Rialto Theatre Organ; 7:30-9:00, Concert, auspices Mrs. Jane Webster Murrell; Reading, "An Interesting Historical Episode."

**WHK (Eastern, 360), 8:00 P. M.**, WHK Trio, musical program of popular selections; Babson's Radio Releas.

Cardinal Boy's Band, Maysville, Kentucky, Studio Program, Hilda Gear, soloist; Jack Keefe's Hotel Alms Orchestra, Merrill Van Pelp, violinist and director; Edgar Schmeel, saxophonist; Eddie Rahn, clarinetist; Rex Atkins, trumpeter; David Crawford, trombonist; Arthur Meese, pianist; Nelson Miller, banjo player; Jack Keefe, drummer.

**WMAQ (Central, Daylight Saving, 447), 9:00 P. M.**, La Salle roof garden orchestra; 9:15, Program arranged by Thomas MacBruney, vocalist.

**WOC (Central, 484), 12:00 noon, Chimes concert; 3:30 P. M.**, Educational program, Clyde G. Kern, lecturer; 6:30, Sandman's visit; 8:00, Pipe Organ recital, Mrs. Frank W. Elliott, organist; 10:00, Artist Musical Program, Erwin Windel, Musical Director; "Rosey" Wright, tenor; E. H. Hass, reader; Katherine Effandt, whistler; Edith McCulloch, soprano; Pauline Mount, soprano.

**WOO (Eastern, Daylight Saving, 509), 11:00-11:30 A. M.**, Organ recital, Mary E. Vogt; 12:00-12:55 P. M., Luncheon music, Wanamaker Tea Room Orchestra; 4:45-5:00, Organ recital, Mary E. Vogt.

**WWJ (Eastern, 517), 12:00 P. M.**, Detroit News Orchestra; 7:00, Detroit News Orchestra; the Town Crier; Vocal numbers by pupils of George Carr.

### The B.-T. Universal Tuning Unit

There is nothing on the market you can compare with the Bremer-Tully Universal Tuning Unit. It is a completely new instrument, that gives unequalled selectivity and control on practically all modern circuits. It replaces coils in Reinartz, Ultra Audion and other regenerative and non-regenerative circuits. Its most circuitous parts are not required. Also gives remarkable results in Radio Frequency and all Reflex Circuits.

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### BATTERIES

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### TUBES AND SOCKETS

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UV-199—King of radio tubes. Use them in your present receiver without changing sockets, batteries or rheostats! The Resist-O-Dapter has a built-in resistance unit which makes your rheostat a vernier filament control. Designed for use with UV-199 tubes and 6 volt batteries (dry or storage).

Order Today!  
\$2 each; 3 for \$5

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INVENTORS OF AMERICA  
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Dealers: Discounts on Request

## LARGEST RADIO STORE IN AMERICA

## BUILD YOUR OWN SET

ALL INSTRUCTIONS INCLUDED ALL PANELS DRILLED—READY TO MOUNT

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CIRCUIT COMPLETE!!

	Reg. Price	Our Price
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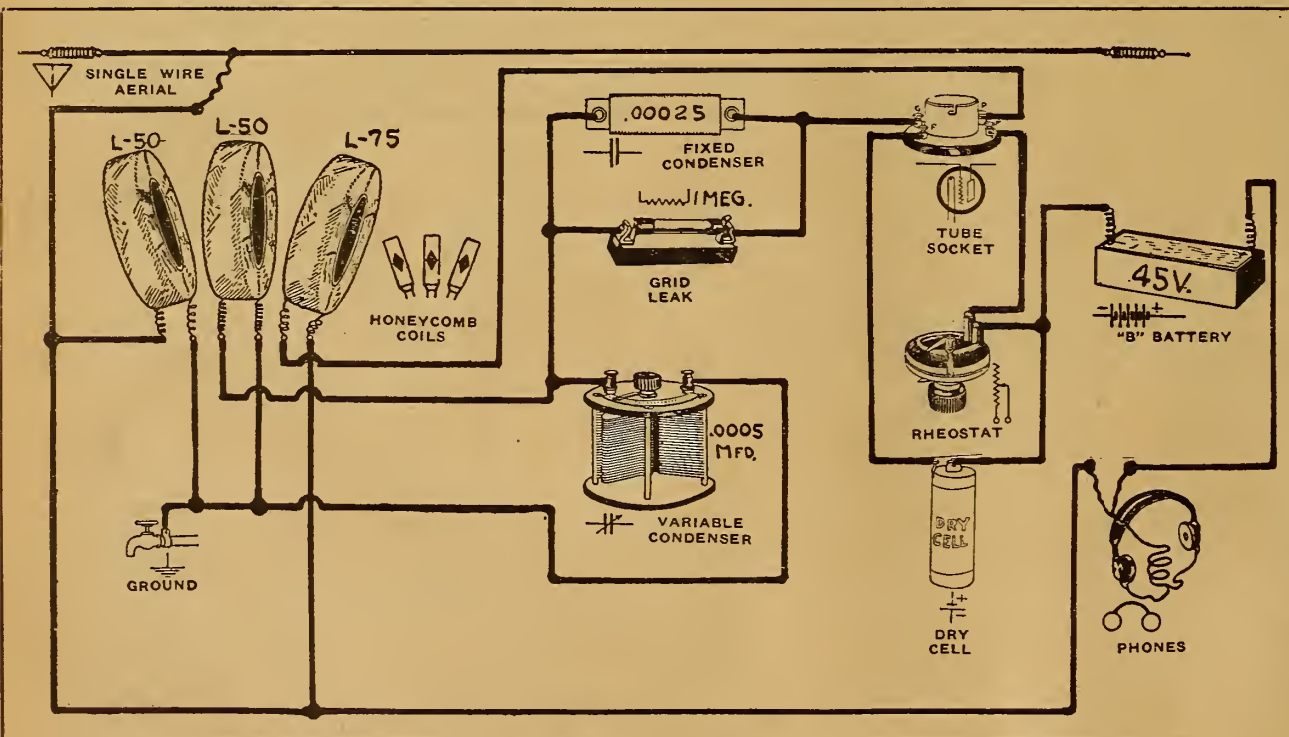


# Radiophone Broadcasting Stations

## Corrected Every Week—Part IV

State, City, Call	State, City, Call	State, City, Call	State, City, Call	State, City, Call	State, City, Call	
<b>Alabama:</b> Auburn, WMAV Birmingham, WSY Mobile, WLEP Montgomery, WKAN	<b>Idaho:</b> Boise, KFAU, KFDD, KFFB Kelllogg, KFEY Moscow, KFEAN	<b>Maine:</b> Bangor, WABI Houlton, WLAN Portland, WTAJ	<b>Nevada:</b> Reno, KDZK Sparks, KFRF	<b>Oklahoma City, KFJF, WKY</b> Norman, WNAD Okmulgee, WPAC Tulsa, WGAF, WLAL	<b>Salt Lake City, KDYL, KZN</b> Vermont: Bellows Falls, WLAK Burlington, WCAX Springfield, WQAE	
<b>Arizona:</b> Phoenix, KDIW, KFAD, KFBC Tucson, KFDH	<b>Illinois:</b> Belvidere, WOAG, WTAH Carthage, WTAD Chicago, KYW, WAAF, WBU, WDAF, WJAZ, WMLA, WPAQ, WSAH, WSAX Decatur, WBAO, WHAP Elgin, WTAS Mattouo, WQAL McLeansboro, WRAS Mt. Vernon, WABF Peoria, WJAN, WQAX Rockford, WIAB Sterling, WBBC Tuscola, WBDZ Urbana, WBM Zion, WCBD	<b>Maryland:</b> Baltimore, WCAO, WEAR, WKC, WNAV Frostburg, WPAQ	<b>New Hampshire:</b> Chesham, WSAU Laconia, WKAV	<b>Oregon:</b> Astoria, KFJI Arlington, KFGL Baker, KFDA Corvallis, KFJH Hillsboro, KFPO Hood River, KFHB, KQP Medford, KFAY Pendleton, KFFE Portland, KDYQ, KFEC, KFIF, KGG, KGN, KGW Salem, KFCD	<b>Virginia:</b> Arlington, NAA Blacksburg, WEAE Fortress Monroe, WNAV Portsmouth, WQAO	
<b>Arkansas:</b> Fayetteville, KFDV Fort Smith, WGAR Little Rock, WCAV Pine Bluff, WOK	<b>Indiana:</b> Anderson, WABO Brookville, WSAL Greencastle, WLAX Huntington, WHAY La Porte, WRAP Marion, WLAQ Mishawaka, WQAO Muncie, WJAF South Bend, WABJ, WGAZ West Lafayette, WBAA	<b>Massachusetts:</b> Boston, WNAC Dartmouth, WMAF, WSAQ Fall River, WSAW, WTAB Lowell, WQAS Medford Hillside, WGI New Bedford, WDAU Springfield, WZB Worcester, WABK, WDAS	<b>New Jersey:</b> Atlantic City, WHAR Camden, WRP Gloucester City, WRAX Moorestown, WBAF Newark, WAAM, WBS, WOR, WRZ N. Plainfield, WEAM Ocean City, WIAD Paterson, WBAN Trenton, WMAL, WOAX	<b>Pennsylvania:</b> Allentown, WCBA, WSN Altoona, WGAW Easton, WMAP Erie, WQAV Grove City, WSAJ Harrisburg, WABB Johnstown, WTAC Lancaster, WDBC, WGAL Parkeburg, WQAA Philadelphia, WCAU, WDAW, WFI, WGL, WIP, WNAZ, WOO, WVAD Pittsburgh, KDEA, KQV, WCAE, WJAS Reading, WBBD, WRAV Scranton, WQAN, WRAY State College, WPAB Villanova, WCAM Wilkes-Barre, WBAX, WNAH	<b>Washington:</b> Aberdeen, KNT Bellingham, KDZB Everett, KFBL Lacey, KGY Nash Bay, KFHH Pullman, KFAP Seattle, KDZE, KDZT, KFHB, KFII, KFJC, KHQ, KJR, KTW Spokane, KFCD, KFIO, KFZ Tacoma, BEL, KFBC, KFEJ, KGB, KMO Walla Walla, KFCE Wenatchee, KDZL, KZV Yakima, KFJQ	
<b>California:</b> Altadena, KGO Bakersfield, KDZB Berkeley, KQI, KRE Del Monte, KLN El Monte, KUY Fresno, KMJ Hollywood, KFAR Long Beach, KSS Los Angeles, KDZF, KFCL, KFL, KHI, KJS, KNV, KNX, KUS, KWH Los Angeles, KFHO Modesto, KND Oakland, KLS, KX, KZM Richmond, KFMC Sacramento, KFBC San Diego, KDPT, KDIM, KFCE, KFA San Francisco, KPO, KUO San Jose, KFAQ, KQW San Luis Obispo, KFBE Santa Ana, KFAV Santa Barbara, KFJH Selma, KFJH Stanford Univ., KFGH Stockton, KJQ, KWG Venice, KFAV	<b>Iowa:</b> Ames, WOI Boone, KFGQ Burlington, WTAS, WLAT Cedar Rapids, WJAM, WKAA Centerville, WDAK Council Bluffs, WPAF Davenport, WHAI, WOC Des Moines, KFJH, WGF Fort Dodge, KFEB, WEAB Gladbrook, KFJK Iowa City, WHAA Lamoni, KFPT Le Mars, KFJY, WIAU Newton, WIAH Oskaloosa, KFHL Ottumwa, KFJL Sigourney, WQAD Sioux City, WEAU Waterloo, WHAC	<b>Michigan:</b> Berrien Springs, KFGZ Dearborn, WWI Detroit, KOP, WCX, WWJ East Lansing, WKAR Flint, WEA Kalamazoo, WQAP, WLAQ Lansing, WHAL Rogers, WCAF Saginaw, WABM	<b>New Mexico:</b> Roswell, KNJ State College, KOB	<b>Rhode Island:</b> Cranston, WKAP Edgewood, WEAG East Providence, WKAD Providence, WEAN, WJAR, WRAH, WSAD, WTAG	<b>West Virginia:</b> Clarksburg, WHEAK	
<b>Colorado:</b> Boulder, KFAJ Colorado Springs, KFQO, KFCK Denver, AA3, DN4, KDZO, KEEP, KFAF, KFDL, KFEL, KFLE, KLZ Greeley, KFID, KFKA Greeley, KFJD Gunnison, KFHA Lakeside, KFKA Trinidad, KFBS, KFHY	<b>Kansas:</b> Anthony, WBL Atwood, WEAD Beloit, WPAK Ceney, KFQP Emporia, WAAZ Hutchinson, KFHS Independence, KFJX Iola, KFID Lindsborg, WPAD Louisburg, KFIL Manhattan, WTG Marion, WRAD Parsons, WQAJ Pittsburgh, KFIV Topeka, WJAG, WPAM Wichita, KFHI, WAAP, WEAH	<b>Minnesota:</b> Duluth, WJAP, WMAT Hutchinson, WFAN Minneapolis, KFJZ, KFEX, WBD, WBAH, WCAS, WLAG, WRAH Moorhead, WPAU Northfield, WCAL St. Cloud, WFAM St. Paul, AV7, WAAH	<b>New York:</b> Albany, WNI Buffalo, WGR Canandaigua, WSAW Canon, WCAD Cazenovia, WMAC Ithaca, WEA Lockport, WMAK New York, KDOV, WBAY, WDT, WEAF, WJX, WJY, WJZ, WLAU, WSAP Poughkeepsie, WFAF Rochester, WABO, WHAM Ridgewood, WHN Schenectady, WGY, WRL Syracuse, WDAI, WFAW, WLAH, WVAN Tarrytown, WRW Troy, WHAZ Utica, WSL	<b>South Carolina:</b> Charleston, WNAQ, WQAH Clemson College, WSAC Greenville, WQAV	<b>Wisconsin:</b> Beloit, WKAW Fond du Lac, KFIZ Kenosha, WQAR La Crosse, WABN Madison, WQAT, WHA Milwaukee, WAAK, WCAV, WHAJ, WIAO Neenah, WIJ St. Croix Falls, WRAL Waupaca, WPAH	
<b>Connecticut:</b> Bridgeport, WKAX Hartford, WDAK New Haven, WFAJ Storrs, WABL Waterbury, WQAD	<b>Delaware:</b> Wilmington, WHAV, WOAT	<b>Missouri:</b> Butler, WNAR Camden, WFAQ Cape Girardeau, WSAB Carrollton, KFJJ Columbia, WAAJ Independence, WPAK Jefferson City, WOS Joplin, WHAH Kansas City, WDAF, WBB, WMAJ, WOO Marshall, WJAT Moberly, KFJH St. Joseph, KFHD, WEAK St. Louis, KFJZ, KFJG, KFIB, KSD, WCK, WEB, WEW, WMAJ, WRAO Springfield, WIAL, WKAS, WQAB Tarkio, WIAT Webster Grove, WOAL	<b>North Carolina:</b> Asheville, WFAJ Charlotte, WBT Greensboro, WQAZ Raleigh, WLAC	<b>South Dakota:</b> Brookings, KFJY Platte, KFJH Rapid City, WCAT Sioux Falls, WFAT Vermillion, WFAJ Yankton, WNAK	<b>Tennessee:</b> Knoxville, WNAV Lawrenceburg, WOAN Memphis, WMC	
<b>District of Columbia:</b> Washington, WABE, WCAP, WDM, WEAS, WHAQ, WIL, WJAY, WJH, WJU, WQAW, WRC	<b>Kentucky:</b> Frankfort, WQAK Lexington, WQAH Louisville, WHAS, WLAP Paducah, WIAR	<b>Montana:</b> Billings, KFCH Bozeman, KFDO Butte, KFAP Great Falls, KDYS Harre, KFBB Stevensville, KFJR	<b>North Dakota:</b> Fargo, WDAY, WPAK Grand Forks, KFJM, KFJQ, WOAB Mayville, KFHU	<b>Texas:</b> Abilene, WQAO Amarillo, WDAQ, WRAU Austin, WCM, WNAS Beaumont, WMAH College Station, WTAW Dallas, KFJZ, WDAO, WFAA, WRR El Paso, WDAH, WPAT Fort Worth, WBAF Galveston, WHAB, WIAC Houston, WCAB, WEAY, WEV, WRAA Laredo, WWAX Orange, KFGX Plainview, WSAT Port Arthur, WFAH San Antonio, ASS, WCAB, WAOI Stanford, WQAZ Tyler, WQAF Waco, WJAD, WLAJ, WWAC Wichita Falls, WKAF	<b>Utah:</b> Ogden, KFCE	
<b>Florida:</b> Jacksonville, WABG, WDAL Miami, WQAM Pensacola, WGAN, WLAV St. Petersburg, WSAG Tampa, WDAB	<b>Louisiana:</b> Alexandria, KFFY Baton Rouge, KFBC New Orleans, WAAB, WAAC, WCAQ, WGV, WIAF, WTAF, WWL Shreveport, KFJX, KFHF, WGAQ	<b>Nebraska:</b> David City, WRAR Freemont, WQAE Grand Island, KFJA Hastings, WQAY Kearney, KFHP Lincoln, KFJZ, WFAV, WJAB, WKAC, WMAH, WQAP Norfolk, WJAG Oak, KFJO Omaha, KFJZ, KFJX, WAAW, WIAK, WNAL, WQAW Tecumseh, WTAU University Place, WCAJ Utica, KFGY York, KFDR	<b>Ohio:</b> Canton, WWB Cincinnati, WAAD, WHAG, WLW, WMB, WSAJ Cleveland, KDPM, WHK, WJAX Columbus, WBAY, WCAB, WEAQ, WLAN, WPAJ Dayton, WAI, WABD Fairfield, WL2 Granville, WJD Greenville, WCBW Hamilton, WBAU, WRK Lebanon, WPG Lima, WOAC Marietta, WBAW Middleport, WSAK Newark, WBA Sandusky, WABH, WQAF Springfield, WQAF Steubenville, WTAH Stockdale, WJAK Warren, WLAZ Wooster, WGAU Youngstown, WDBF	<b>Oklahoma:</b> Aidmore, WQAA Bristow, KFJH Chickasha, KFJG	<b>Alaska:</b> Bapid City, WCAT Juneau, KFJU Yermillion, WFAJ Yankton, WNAK	<b>Porto Rico:</b> San Juan, WKAQ
<b>Georgia:</b> Atlanta, WGM, WSB College Park, WDAJ Gainesville, WEAY Macon, WMAZ Savannah, WBAW	<b>Alabama:</b> Auburn, WMAV Birmingham, WSY Mobile, WLEP Montgomery, WKAN	<b>Idaho:</b> Boise, KFAU, KFDD, KFFB Kelllogg, KFEY Moscow, KFEAN	<b>Maine:</b> Bangor, WABI Houlton, WLAN Portland, WTAJ	<b>Nevada:</b> Reno, KDZK Sparks, KFRF	<b>Oklahoma City, KFJF, WKY</b> Norman, WNAD Okmulgee, WPAC Tulsa, WGAF, WLAL	<b>Salt Lake City, KDYL, KZN</b> Vermont: Bellows Falls, WLAK Burlington, WCAX Springfield, WQAE

### TRIPLE HONEYCOMB COIL LOUDER THAN STANDARD



**D**R. EARL MCGREW, of 825 Webster avenue, Chicago, Ill., reports that his triple honeycomb coil set works much more loudly than the standard. He developed the set himself. These stations he has heard in the last seven weeks: KYW, WBV, WPAQ, WDAF, WAAF, WMAQ, WWAY, WOC, WGY, WBAF, WDAF, WHB, KSD, WAAK, WIAO, WHAS, WHAL, WTAS, WRW, WHAS,

WJAN, WHA, KDKA, WLW, WAAH, WSAH, WDAJ, WWJ, WOAW, WOS, WHAZ, WLAG, WSB, WZB, WCX, WMC, KFJL, WGR, WEAF, WSAI, WJAZ and WCBD. He suggests that it may be advisable to reverse the tickler coil leads to find the direction giving maximum reception. Mr. McGrew uses a dry cell tube with 45 volts on the plate.

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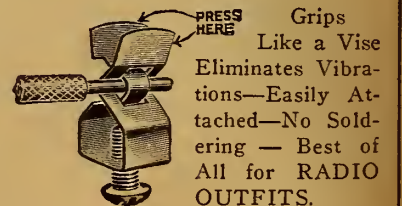
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ADVANCE PROGRAMS

(Continued from page 7)

WJAX (Eastern, 390), 8:00 P. M., Concert by the Hotel Cleveland Orchestra, Iva Francis, director; Rudolph, violin soloist.
WJAZ (Central, Daylight Saving, 447), 10 P. M.-2:00 A. M., Musical Program, Selections, Oriole Orchestra, Dan Russo, director; Ted Florito, coach; Jack Crampton, baritone; R. T. Navigato, soprano; Helen Rauh, pianist; Wm. F. Zimmer, tenor.
WLW (Eastern, 309), 4:30 P. M., Adelaido Antel, pianist; Reading, "Love," Fred Smith; 10:30, Selections by the Eastern Hills Dance Orchestra; "Medley of Old Favorites," "I'm Drifting Back to Drenmland," "I'm Steerin' for Erin," Cincinnati Harmony Four, Samuel Zadek, tenor; August Schwarm, 2nd tenor; Arthur S. Roth, baritone; Walter Schwarm, 1st tenor; "LeKue Sonata," "Moonflower," "Adeieu," William Steess, violinist; "Thought, the Corner Stone of Success," talk by Maxwell D. Schrieber.
WMAQ (Central, Daylight Saving, 447), 9:00 P. M., La Salle roof garden orchestra; 9:15, The Conel Tio.
WDC (Central, 484), 12:00 noon, Chimes concert; 3:30 P. M., Educational program, Karl G. Stephan, lecturer; 5:45, Chimes concert; 6:30, Sandman's visit.
WDO (Eastern, Daylight Saving, 509), 11:00-11:30 A. M., Organ recital, Mary E. Vogt; 12:00-12:55 P. M., Luncheon music, Wanamaker Tea Room Orchestra; 4:45-5:00, Organ recital, Mary E. Vogt; 7:45, Dinner music, Hotel Adelphia Roof Garden Concert Orchestra; 8:30, Concert and organ recital, Mary E. Vogt; 9:30, Dance music.
WJ (Eastern, 517), 12:00 P. M., Detroit News Orchestra; 7:00, Detroit News Orchestra; the Town Crier; Douglas Bailey, baritone; William W. Schumaker, tenor; Julius Wolpert, pianist.

Friday, September 7

CFCA (Eastern, Daylight Saving, 400), 9:00-9:30 P. M., "Lohengrin," Star Concert Orchestra; Nellie Gill, soprano; "Chant Sans Paroles," Star Concert Orchestra; "Ave Maria," Marnie Roth, violinist; "Longing," "I Love Thee," "Serenata," Star Concert Orchestra.
KOKA (Eastern, 326), 11:30 A. M., Music, recital, S. Hamilton Co.; 5:15 P. M., Dinner concert, Grand Symphony Orchestra; 6:30, Address to the farmers, Frank E. Mullen, Radio Editor of the National Stockman and Farmer; 6:45, Children's Period; 7:20, Concert, Ruth Bingaman, pianist; Mrs. J. C. Wilson, reader; Alan B. Davis, baritone; 3:30-4:00 P. M., Woman's program; 8:00-8:15, Vocal solos; 8:15-9:00, Studio program, George Olsen and Orchestra; 10:00-11:00, Dance music, George Olsen and Orchestra.
KHJ (Pacific, 395), 12:30-1:15 P. M., Concert Numbers; 2:30-3:30, Matinee Musicale; 8:45-7:30, Children's Hour, "Uncle John," 7:00-7:30, Prof. Arthur Blskeley, organist; 8:00-10:00, De Luxe Program, "The Wayfarer Chorus."
KSD (Central, 546), 8:00 P. M., Musical program.
KYW (Central, 345), 5:50 P. M., Children's bedtime story; 9:00-10:30, Concert, Donald Osborns Campbell, baritone; Lysle G. Sutton, accompanist; Robert C. Kratschmer, violinist; B. G. Swift, violinist; Sallio Menkes, accompanist; Isham Jones and his orchestra.
WBZ (Eastern, Daylight Saving, 337), 8:00 P. M., Dinner concert, WBZ Trio; 7:30, Bedtime story for children; Current book review, J. W. Gilman; 8:00, Concert, Mrs. Harry S. Kitson, soprano; Mrs. Miriam Minyan Thomson, accompanist; WBZ Trio; 9:00, Bedtime story for grownups, Orison S. Marden.
WDAK (Eastern, Daylight Saving, 395), 12:00-12:54 P. M., Organ recital, Stanley Theater; dinner music, Arcadia Cafe Concert Orchestra, A. Sarkozl, director; 2:00-3:00, Short talks and song recital; 4:30-5:55, "Affairs of the Heart," Betsy Logan; Song recital; 7:30-8:00, Bedtime stories, Dream Daddy; 8:00-12:00, Radio drama, direction Walter Greenough; Song recital; Special features from Stanley Theater; Dance music; Songs by Harry Glyn.
WDT (Eastern, Daylight Saving, 405), 12:00-12:50 P. M., Selections by Chester Frost and his Famous Bostonians; Songs by Jack Yellen, composer; 11:00-11:50, Selections by Vaughn De Leath's WDT Feature Orchestra; Songs by Frank Bessenger, tenor.
WFI (Eastern, Daylight Saving, 395), 1:00-2:00 P. M., Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 3:00, Piano recital; 6:30, Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 7:00-7:30, Children's Own Half Hour, Stories by Cousin Sue.
WGR (Eastern, Daylight Saving, 360), 12:00-12:30 P. M., George Albert Bouchard, organist; 6:30-7:00, George Albert Bouchard, organist; 7:00, Digest of the Day's News; 9:00, Howard Brothers and Noah Orchestra; address, F. B. Thompson, engineer, Vacuum Oil Co., "The Heavy Oil Fan."
WGY (Eastern, 380), 1:00 P. M., Music and reading, Dr. William Burgess Cornell; 7:45, "The Old Brain," Ernest Griffiths, tenor; Irving Bullock, accompanist; Fred Grazaide, violinist; "Melody in E," John Finke, pianist; 10:00, Musical program.
WHAS (Central, 400), 4:00-5:00 P. M., Mary Anderson Theatre Orchestra; Ollie Jones, conductor; Selections on the Rialto Theatre Organ; 7:30-9:00, Concert, Carl Zoeller's Melodists, Carl Zoeller, director and drummer; William Druber, Trumpeter; Logan Collins, saxophonist; Carter Bannan, pianist; Elmore Lampe, pianist; J. Sellman, trombonist; James Stewart, banjoist; Bill Gruber, trumpeter; Louis Giancola, saxophonist; Reading, "An Interesting Historical Episode."
WIP (Eastern, Daylight Saving, 509), 3:00 P. M., Short talks and song recital; 6:00, Dinner music, Dick Regan and WIP Little Symphony Orchestra; 6:45, "Radio Baseball Done," by Monte Cross old-time player; 7:00-7:30, Bedtime stories, Uncle Wip.

WJAZ (Central, Daylight Saving, 447), 10:00 P. M.-2:00 A. M., Musical program, selections, Oriole Orchestra; Dan Russo, director; Ted Florito, coach; Elizabeth Braslich, contralto; Helen Louis Schaffer, soprano; Gladys Louise Welge, violinist; Sabina Soffer, pianist; Walter S. Campbell, tenor.
WMAQ (Central, Daylight Saving, 447), 9:00 P. M., La Salle Roof Garden orchestra; 9:15, Program arranged by Cosmopolitan School of Music and Dramatic Art.
WDC (Central, 484), 12:00 noon, Chimes concert; 3:30 P. M., Educational program, C. E. Wilent, lecturer; 5:45, Chimes concert; 6:30, Sandman's visit.
WDD (Eastern, Daylight Saving, 509), 11:00-11:30 A. M., Organ recital, Mary E. Vogt; 12:00-12:55 P. M., Luncheon music, Wanamaker Tea Room Orchestra; 4:45-5:00, Organ recital, Mary E. Vogt.
WJ (Eastern, 517), 12:00 P. M., Detroit News Orchestra; 7:00, Detroit News Orchestra; the Town Crier; Crosbie White, tenor; C. Bruce Myers, baritone; Eleanor Zleske, pianist.

Saturday, September 8

CFCA (Eastern, Daylight Saving, 400), 8:00-9:00 P. M., Selection from "A Persian Garden," Star Concert Orchestra; Ernest Morgan, baritone; "Stizlietta," Star Concert Orchestra; "Gavotte," Jacques Sterin, cellist; "Poupee Valsante," Star Concert Orchestra; "Tambourin Chinois," Harry Adaskiu, violinist; "Air de Ballet," Canzouetta, Star Concert Orchestra.
KDKA (Eastern, 326), 11:30 A. M., Music, recital, S. Hamilton Co.; 5:15, Dinner concert, Westinghouse Band; T. J. Vastine, director; 6:45, Children's Period; 7:20, Concert, Westinghouse Band, Alouise Marr, soprano; Ernest Higgins, tenor; Sallie Murray, soprano; Lelia Wilson Smith, accompanist.
KGW (Pacific, 492), 3:30-4:00 P. M., Children's program, story by Aunt Nell; 10:00-11:00, Dance music, George Olsen and Orchestra.
KHJ (Pacific, 395), 12:30-1:15 P. M., Concert Numbers; 2:30-3:30, Matinee Musicale; 8:45-7:30, Children's Hour, "Uncle John," 8:00-10:00, De Luxe Program, Paul Ford, baritone.
KSD (Central, 546), 8:00 P. M., Orchestral concert, organ recital, vocal and instrumental specialties broadcast direct from the Missouri Theatre.
KYW (Central, 345), 5:50 P. M., Children's bedtime story; 7:00-7:58, Musical program, W. W. Kimball Company; 8:05, "Under the Evening Lamp," service by Youth's Companion.
WBZ (Eastern, Daylight Saving, 337), 7:00 P. M., Dinner concert, Hotel Kimball Trio; 7:30, Bedtime story for children; 8:00, Concert, Mrs. Helen Campbell Triplett, soprano; Milton Aronson, violinist; Catherine Whitfield Ford, accompanist; 9:00, Bedtime story for grownups, Orison S. Marden.
WDAK (Eastern, Daylight Saving, 395), 12:00-12:54 P. M., Organ recital, Stanley Theater; dinner music, Arcadia Cafe Concert Orchestra, A. Sarkozl, director; 2:00-3:00, Artist recital; 4:30-5:55, Fashion talk and piano recital; 7:30-8:00, Bedtime stories, Dream Daddy.
WDT (Eastern, Daylight Saving, 405), 12:00-12:50 P. M., Children's program "Tinkerman" and "The Winged Taxi" series, Edith Craine; "Yes We Have No Bananas," "Bebe," "Susan," "Where the Sacramento River Flows," "Swinging Down the Lane," "Stella," "Hawaiian Nightingale," "Lady of the Evening," Selections from "Wildflower," Jules Lavo's Harmonists, Original songs by The Original Radio Girl.
WFI (Eastern, Daylight Saving, 395), 1:00-2:00 P. M., Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 3:00, Song recital and piano solos; 6:30, Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 7:00-7:30, Children's Own Half Hour, Stories by Cousin Sue; 8:00, Song recital, dance music, Meyer Davis Bellevue Stratford Dance Orchestra.
WGR (Eastern, Daylight Saving, 360), 12:00-12:30 and 6:30-7:00 P. M., George Albert Bouchard, organist.
WGY (Eastern, 380), 8:30 P. M., Music, Meyerhoff's Orchestra, Tehn Eyck Hotel, Albany, N. Y.
WHAS (Central, 400), 4:00-5:00 P. M., Mary Anderson Theatre Orchestra; Ollie Jones, conductor; Selection on the Rialto Theatre Organ; 7:30-9:00, Concert, nuspices of Mrs. Emery Nold; Reading, "An Interesting Historical Episode."
WIP (Eastern, Daylight Saving, 509), 1:00-2:00 P. M., Organ recital, Karl Bonawitz, Germantown Theater; 3:00, Song and piano recital; 7:00-7:30, Bedtime stories, Uncle Wip; 8:00, Musical program; 10:00, Dance music.
WJAZ (Central, Daylight Saving, 447), 10:00 P. M.-2:00 A. M., Musical Program Selections, Oriole Orchestra, Dan Russo, director; Ted Florito, coach; R. F. Elliott, tenor; Renna Graham Gallow, violinist; Harriet Weeber, pianist; Florence Nelson, soprano.
WMAQ (Central, Daylight Saving, 447), 9:00 P. M., Music from the Chicago Theatre; 9:00, La Salle Roof Garden Orchestra.
WOC (Central, 484), 12:00 noon, Chimes concert; 3:30 P. M., Educational program, C. C. Hall, lecturer; 5:45, Chimes concert; 6:30, Sandman's visit; 9:30, Dance music, P. S. C. Orchestra.
WDD (Eastern, Daylight Saving, 509), 11:00-11:30 A. M., Organ recital, Mary E. Vogt; 12:00-12:55 P. M., Luncheon music, Wanamaker Tea Room Orchestra; 4:45-5:00, Band concert, J. W. C. I. Band; Organ recital, Mary E. Vogt.
WJ (Eastern, 517), 12:00 P. M., Detroit News Orchestra.

Sunday, September 9

KHJ (Pacific, 395), 10:00 A. M., Sermon and service, 10:30-11:00, and 7:00-7:30 P. M., Prof. Arthur Blskeley, organist.
KYW (Central, 345), 10:00 A. M., Church services, St. Chrysostom's Episcopal Church; Rev. Norman J. Hutton, rector; 5:00-8:00 P. M., Classical and semi-classical selections, Sisson Hotel; Theodore Ratzer, cellist; George Bass, violinist; A. L. Shynman, pianist.
WBZ (Eastern, Daylight Saving, 337), 7:30 P. M., Sunday vespers, Springfield Municipal Chimes; Ernest Newton Bagg, chime ringer; 8:30, Church services, Adjutant J. H. Bloethe of the Salvation Army.
WFI (Eastern, Daylight Saving, 395), 7:30 P. M., Church services, Arch street Presbyterian Church, organ recital.
WGR (Eastern, Daylight Saving, 360), 3:00 P. M., Vesper service, the Rev. Jacob Eberling; 11:45.
WGY (Eastern, 380), 10:00 A. M., Church Services, St. George's Episcopal Church, Schenectady, N. Y., Rev. B. W. R. Taylor, Pastor; 6:30 P. M., Church Services, St. George's Episcopal Church, Schenectady, N. Y., Rev. B. W. R. Taylor, Pastor.
WHAS (Central, 400), 9:57 A. M., Organ Music; 10:00, Church services, auspices of the Broadway Baptist Church; Rev. Dr. Russell Johnson Pirkey, pastor; H. U. Goodwin, organist and director; Mrs. John Rasmussen, soprano; Angeline McCrocklin, contralto; William Layne Vick, tenor; William C. Burger, baritone; 4:00-5:00 P. M., Concert recital, Fanny May Baldrige, Mrs. James W. Tyler, Jr., accompanist.
WKK (Eastern, 360), 8:00 P. M., Program of popular operatic numbers by the W. H. K. Orchestra.
WJAZ (Central, Daylight Saving, 447), 8:00-9:00 P. M., Musical Program, Selections, Oriole Orchestra; Dan Russo, director; Ted Florito, coach; R. G. Ball, baritone; Helen Davis, soprano; Margaret Garrity, pianist; Herbert Weis, cellist; Joseph Discal, tenor.

WJ (Eastern, 517), 11:00 A. M., Service of St. Paul's Episcopal Cathedral; 4:00 P. M., Detroit News Orchestra.

Monday, September 10

WDAR (Eastern, Daylight Saving, 395), 12:00-12:54 P. M., Organ recital, Stanley Theater; Dinner music, Arcadia Cafe Concert Orchestra; 2:00-3:00, Song recital; 4:30-5:55, Fashion talk, "Affairs of the Heart," Betsy Logan; Musical program; 7:30-8:00, Bedtime stories, Dream Daddy.
WFI (Eastern, Daylight Saving, 395), 1:00-2:00 P. M., Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 3:00, Piano and song recital; Short talks; 6:30, Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 7:00-7:30, Children's Own Half Hour, Stories by Cousin Sue.
WGR (Eastern, Daylight Saving, 360), 12:00-12:30 P. M., George Albert Bouchard, organist; 6:30-7:00, George Albert Bouchard, organist; 7:00, Digest of the Day's News; 7:30, Music and Recitations of the annual banquet of the National Association of Cost Accountants.
WGY (Eastern, 380), 1:00 P. M., Music and address, Clarence Foote; 7:45, Program from Temple Beth Emeth, of Albany, N. Y., Evening service for New Year "Rosh-Hashanah," Dr. Marlius Ranson, Rabbi; Musical program, Temple Quartet; J. Austin Springer, organist and director of music.
WHAS (Central, 400), 4:00-5:00 P. M., Mary Anderson Theatre Orchestra; Ollie Jones, conductor; Roy C. Parks, organist.
WHAZ (Eastern, 380), 9:00-10:30 P. M., First anniversary night—Domino Novelty Orchestra; address by Dr. Palmer C. Ricketts, President of Rensselaer Polytechnic Institute.
WIP (Eastern, Daylight Saving, 509), 1:00-2:00 P. M., Organ recital, Karl Bonawitz, Germantown Theater; 3:00, Short talks and musical program; 6:00, Dinner music, Dick Regan and WIP Little Symphony Orchestra; 7:00-7:30, Bedtime stories, Uncle Wip.
WDO (Eastern, Daylight Saving, 509), 11:00-11:30 A. M., Organ recital, Mary E. Vogt; 12:00-12:55 P. M., Luncheon music, Wanamaker Tea Room Orchestra; 4:45-5:00, Organ recital, Mary E. Vogt; 7:45, Dinner music, Adelphia Hotel Roof Garden Concert Orchestra; 8:30, Concert, WOO Orchestra, Robert E. Golden, director; 9:00, Dance music, Hotel Adelphia Roof Garden Dances Orchestra.

Long Aerials an Error

Long aerials are against sharp tuning. Many fans labor under the idea that a longer aerial will give them greater range and entertain all sorts of wrong ideas concerning aerials. If you want to get the most from your set and be able to tune it properly, do not use more than 100 feet of aerial.

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## Broadcasts Spread Culture

**An Increasing Demand for Better Entertainment**  
THERE are very few persons who realize just what broadcasting is actually doing for musical America. It is only by bringing the very best music into the home that makes the best most desirable. Thus, the broadcasting station is the only medium in existence which has the best possibilities for creating love for classical music. It is safe to say that every earnest program director of Radio broadcasting is endeavoring to place in the public menu the best musical food.

## Musical Atmosphere Created

**Broadcasting Concerts Has Brought Better Music**  
BETTER music is beginning to take the place of jazz. Jazz is an aftermath of the war; the present day jazz is more subdued, possesses more melody. The more violent of the wailing and groaning blues have gone. In their place still is jazz, but of a different nature, with less noise and more music.

Radio broadcasting has done much to create a musical atmosphere but the standard of the concerts broadcast to thousands of homes must be raised and better artists retained. Real artists demand high pay for their services; the Radio audience pays nothing, but the problem must be overcome.

## Business Improvement

**Elements Responsible for the Growth of Radio**  
BY this time most of the people have become more or less familiar with the various types of Radio receiving apparatus, especially from a practical standpoint. A large number have gone so far as to make an extensive study of the science, its history, development, and future possibilities, but a very small number, comparatively speaking, have looked on Radio as a business phenomenon. Very few seem to realize that the rapid growth of the Radio business has no parallel in the industrial history of the United States.

A number of elements are responsible for the rapid growth of Radio reception and broadcasting but extreme popular favor was given the science by newspapers. The national desire for more knowledge was further stimulated by the establishment of broadcasting stations.

Before the advent of Radiophone broadcasting on the lower wave lengths there were but few small stores throughout the country selling Radio apparatus exclusively. Within a few weeks after several broadcasting stations had been established, thousands of Radio stores sprang up in cities and towns all over the country.

The Radio business of the country grew from a few thousand dollars a day to more than \$6,000,000 a day. At the outset there were only twenty-five small companies manufacturing Radio apparatus but this number was increased to 6,000 in less than five months.

Radio engineering talent was scarce and only about one percent of the number engaged in a Radio business were really conversant enough with the science to be of benefit to the public from an educational standpoint.

The people, most of them, did not heed the warnings issued by the more conscientious Radio authorities but plunged blindly into the field without fear of what the future might bring. Eighty per cent. of the people were prospective buyers. They had the money. Why not get a part of it? Enough money was uselessly spent on poor apparatus to establish a sinking fund capable of ultimately wiping out the nation's war debt.

The Radio dealer, jobber and manufacturer of today must be a trained business man, a merchandiser, a financier with initiative and forethought. The manufacturer must employ the necessary technical brains, and the knowledge of knowing how must be exemplified in the appearance and function of his product. The jobber and dealer must have sufficient knowledge of his business to keep the confidence of the people.

## RADIO INDI-GEST

### Take Your Girlie to the Earphones

"I'VE BOUGHT	HE HAD A
MY SWEETIE	NOBLE THINKER.
A RADIO,"	"YOU SEE,"
CONFIDED YOUNG	SAID HE,
SPARKINS	"THE SET
TÓ ME	IS GREAT
YESTERDAY,	FOR CUTTING
AND I	DOWN ON
OF COURSE	THEATER,
ASKED WHY,	DANCE,
AND LISTENED	CABARET
IN FOR HIS	AND TAXI
BROADCAST.	BILLS.
IT SHOWED	TRY IT."

GOO GOO.

### And He Made It All by Himself!

Dear Indi: The attached only goes to prove that Raymond Soper made a souper but did not read Radio Digest for his directions. The gem was removed from the Dallas (Texas) News. Here goes:

**Question.**—I have made myself a Radio receiving set with which I use an electric light globe for the vacuum tube. My slide coil is made of bare copper wire wound around a laking powder can. The tin can seems to make better connections between the wires than the paste-board type of cylinder. I use a condenser between the phones. This condenser is made of about six layers of tin foil, laid one upon the other. I use only one battery, as there is no place to put another battery on the tube. A friend of mine told me that a light globe was better than a vacuum tube, so I did not buy a tube. I have not been able to hear a sound out of my set—not even static. What is my trouble?—Raymond Soper.

**Answer.**—Someone has misinformed you as you do not have any more of a Radio set now than when you started.

etc., etc., in which ye Radio Ed of the Dallas News enlightens, or should I say, illuminates Raymond about electric light globes and tin cans. J. F. W.

### A-B-C Lessons for Indigest Beginners

#### Chapter XII—Ours Leads in Nothing Best

BY GOSH

**L** IS for Lead-in  
Useful?—There's no doubt,  
But mine lead in some lightning  
And wouldn't lead it out.

### The Major Presents His Thanks

At last I have a sure cure for static! Page Major Mauborgne. Follow my directions (copyrighted) and you will hear atmospheric no more. Solder the aerial lead to the ground lead, then weld one end of the lightning arrester to this. Connect the set to the other end of the arrester. Simple, isn't it? It sure is. Hon. E. Comb.

P. D. Q. Enclosed find 1 (one) carload of rubles in payment for your acceptance of this kink, subject to its appearing in the February 31 issue of your notorious column. H. E. C.

### Hah, an Uncopyrighted Song. Good!

Dear Indi: I would be very glad if you would try this on your loud speaker some day. (All broadcasters hereby allowed to use it without fear of Chief Justice Taft.) Try to sing it to the tune of "Yes, We Have No Bananas, We Have No Bananas Today."

"Yes, we have no variocouplers, we have no variocouplers today.

We have rheostats and potentiometers, grid leaks and variometers, and all sorts of other things.

We have old fashioned generators, new style oscillators, But yes, we have no variocouplers, we have no variocouplers today.

"Yes, we have no variocouplers, we have no variocouplers today.

We have switch points and switch stops, condensers and cabinet tops, and all sorts of other things.

We have old, burned out rectifiers, seventeen dollar amplifiers, But yes, we have no variocouplers, we have no variocouplers today."

Thanks, very much. I remain yours until your postbox wears out waiting for my nickel-plated lead dollar.

W. I. RELESS.

This marks the grave  
Of Clemmons Fasting  
He continued to send  
While WHAZ was broadcasting.

### Nothing, Same as Usual

Dear Indi: What price am I bid for the following:  
Here lies the remains of Douglas Sylvester  
He forgot to connect his lightning arrester.

Under this turf lies mad Henry Spencer

He tried to digest his variable condenser.

MIKE ROFARADS.

## Looking Ahead

**Great Scandal Unearthed—All About Walla Walla Social Life**—Gobs upon gobs of gossip have been scooped up by Indi-Gest's very special correspondent located near the keyholes at the home of Station BLAH, Indi-Gest broadcaster on the sunny south sea isle of Walla Walla. Why haven't we heard from Brambin Bray, official janitor and announcer? Why have all appeals to Izzy and Ikey, chief trained chimpanzee antenna raisers, been futile? There has been monkey business! The truth has outed. Read this blood-curdling and horrifying tale in the next edition of Indi-Gest. At all newsdealers, 10c; at any other newsdealers, 10c anyway.

## Out Gunning for Static



## Condensed

By DIELECTRIC

Every amateur fan in the country who can possibly leave his DX set long enough for a trip to Chicago will gather at the second national convention of the American Radio Relay League. It is expected that more amateurs will meet face to face on this occasion than ever before. Of course, there are more "hams" now than two years ago; the membership of the league has grown very much since that time. It is indeed a healthy sign to find so large a proportion of the amateurs banded together. If you are not now a member, get in quick. It's to your interest—and ours.

In looking over the list of representatives at the Radio conference, in Washington some time ago, do you find one from the vast and important body of listeners in? Well, is it not about time we were organized so that our viewpoint could be presented with authority on occasion? A Baltimore chapter of the Radio Listeners' Protective Association has been organized; it is hoped that other cities will follow suit. This is a move to enlist the interest of every individual who finds pleasure in using a receiving set.

Eleven years of patient effort to perfect a means of keeping static from drowning out desired signals has resulted almost in success for Chief Electrician Scott of the navy. Although this device in its present stage is rather large for ordinary use, time will effect something adaptable to use by the average listener in. Another static remover is reported nearly ready for placing on the market.

"Dead" spots in Radio reception have been found in various parts of the world but no way has been found to overcome their effect on electromagnetic waves. Special tests are now being carried on by explorers of the geological survey along the banks of the Colorado river in an attempt to find how far Radio signals will penetrate the deep canyon in that section. It has its bearing on Radio for use in mines, where such communication would be of great value.

Just as I remarked in these columns a short time ago, it is entirely possible to turn a half-interested Radio fan into a bad knocker by simply forcing the attention of a loud speaker upon him. Colonel Green thought to provide amusement for his neighbors at Round Hills, Mass., but instead drowned the chatter of summer residents at Nonquit. The huge loud speakers which carried programs from the studio of WEAJ in New York to these country folk will have to await the exit of vacationists before resuming. The retransmission of WEAJ's concerts entails a lot of expense but few men are so public spirited as the owner of Station WMAJ.

Anyone who followed the series of articles so clearly describing the present patent tangle, which appeared in Radio Digest recently, will be better able to fathom the meaning of Judge Hand's decision in reference to the Cutting and Washington Radio corporation in their suit against the Westinghouse Electric company. It is sincerely to be hoped that for the sake of continued progress in Radio manufacture the whole patent situation will be straightened in the near future. The automotive industry went through much the same thing.

On the night that WJZ bid all a sad farewell from their Newark, N. J., station it really seemed to mark the extinction of apparatus so long used to entertain vast Radio audiences. That was not to be, however, for the transmitter which at times kept from receiving sets in the vicinity of Newark all other stations on the 360 wave is again to function. It will carry the voice of the announcer at WBZ with an antenna input twice that possible up to the present.



# First Steps for Beginners in Radio

## Chapter XV—Filament Lighting Batteries

By Thomas W. Benson, A. M. I. R. E.

**BEGINNERS** will find the accompanying series by Mr. Benson very helpful in learning the rudiments of the popular science of Radiotelephony. The articles yet to appear are:

- Chapter XVI—Plate Batteries.
- Chapter XVII—Using Alternating Current on Tubes.
- Chapter XVIII—Testing Radio Instruments.
- Chapter XIX—Locating Trouble in the Set.
- Chapter XX—Useful Information and Formulas.

**T**HE earlier forms of tubes used for Radio required a six-volt battery to operate the filament; each tube required one ampere of current, which made a storage battery a necessity. At the present time the tubes using heavy filament currents are practically unused, preference being given to the tubes that can be operated from dry cells, thus making the set more compact and portable.

Many fans still use a storage battery, especially when they have in operation a loud speaker requiring current for the field windings. Much has been written as to the care of the storage battery, but many persons continue unintentionally to abuse the battery. When the battery is charged at home it is more than likely the filling is neglected. The filling should be carefully attended to, especially during the summer months. When the solution gets below the top edge of the plates they are exposed to the air, which results in

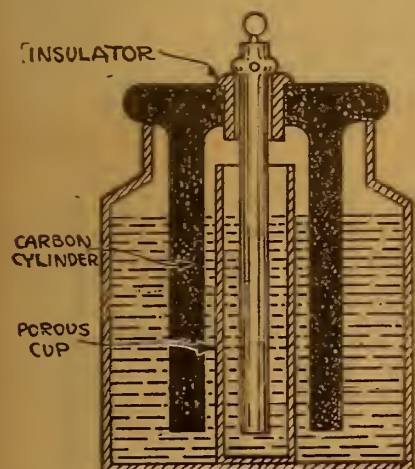


Figure 58—Cross sectional view of homemade Fuller battery for lighting tube filaments.

sulphation. The thin film of sulphate on the plates prevents the current from reaching the surface, which reduces the capacity of the battery. Keep the batteries well filled by adding distilled water when the solution gets low.

### Corrosion Produces Noisy Operation

Another point is the corrosion of the terminals. The noisy operation of a set can often be traced to a corroded battery terminal giving an erratic current flow to the filament.

It is well to check the corrosion as soon as possible. When taking the battery off charge, wipe the top of it with a rag dipped in ammonia. The ammonia counteracts any acid sprayed on the top and keeps the terminals free from corrosion.

Many fans fail to realize the danger of bringing open flames near a battery while charging. It is well to remember that hydrogen gas is given off freely when the charge is complete; this gas mixed with air is highly explosive. An explosion may break the top of the battery or even throw acid on the face and into the eyes. For the same reason do not disconnect the charging wires from a battery with the charging current on, for in many cases the arc caused by removing the wires

will ignite the gases with disastrous results.

### Recharge Batteries at Regular Intervals

During the summer many persons do not use their sets as frequently as in the fall and winter, with the result that the battery is not recharged very often. This is poor practice; the battery should be recharged every month at least to keep it in good shape and to prolong its life. Do not add acid to the battery unless it is definitely known that the battery has leaked or the acid spilled. The proper method of adding the acid is to give the battery a full charge and then pour out the solution. A new solution can be mixed, having a specific gravity of 1.250, and poured in after it is cool. Add the acid to the water while mixing, stirring constantly and pouring in the acid slowly.

When connecting the battery to the set do not neglect to install proper fuses to protect the circuits. It is rather unpleasant to see a set start to smoke and on opening it find the wires partly fused away and the insulation destroyed.

A short circuit in the set may ruin it or start a fire in the room, besides damaging the battery by overheating and buckling the plates. To prevent this, install a fuse block near the battery, using the proper size fuses. Remember, a fuse is intended to blow; if a fuse of the right capacity continues to blow out there is something wrong.

### Care of Dry Cells

Users of dry batteries for filament current are more lax in protecting their filament circuits, thinking that a dry cell can do no harm. Regardless of the damage that it may do the set, a shorted dry battery may spoil an evening's pleasure. These cells are termed dry cells, when as a matter of fact they contain some moisture and when shorted have a tendency to ooze a sticky liquid around the top. If enclosed in the set this chemical solution may damage the furniture or destroy the insulating qualities of parts of the instruments.

It is well to protect the cells with fuses of the proper size. Determine the amount of current the set uses and obtain automobile fuses of the right size so an excess current will blow them. The fuse can be mounted at some convenient point inside the set close to the filament battery terminals.

The cost of dry cells has led many to make use of various types of wet cells for lighting the filaments. The voltage of the Edison cell is rather low, about .7 on a closed circuit; it requires two of them for each dry cell used. They are remarkably constant in service, and when once set up need not be disturbed till the elements are exhausted.

The Edison cell consists of a zinc plate forming the negative terminal and a positive terminal made of an oxide of copper, the solution being a saturated solution of caustic soda in water. The plates are dif-

ferent to make; they should not be made at home. The solution is very destructive and should be handled with care, for if it is spilled on the hand bad burns or the destruction of articles of animal fibre will result. A thin layer of paraffin oil is poured on the surface to prevent the air

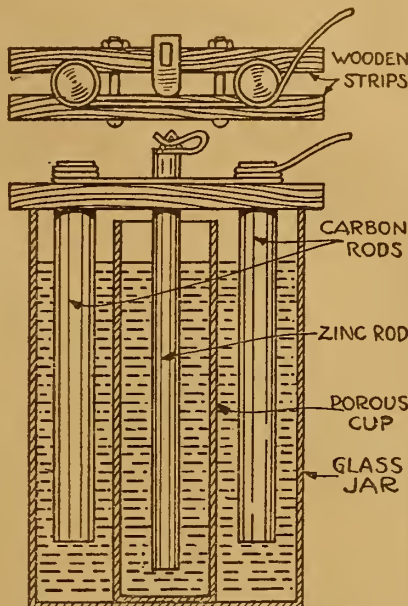


Figure 59—Converting sal-ammoniac cell to bichromate cell destroying the active properties of the solution.

### Types of Batteries to Be Used

There are several types of batteries that can be made at small cost and which will serve in the place of dry cells. The common sal-ammoniac cell cannot be used for the purpose since the current drops off

rapidly while in use. The Fuller cell is perhaps best suited to the purpose; it is shown in the illustration Figure 58. The voltage of this cell is 2; one of them is sufficient for tubes having a filament voltage of 1.5. Two or three cells may be connected in series for higher voltages, but they should be used only with tubes using one quarter ampere or less.

The container is any glass vessel about 4 inches in diameter and 6 inches high. A porous cup of unglazed earthenware or porcelain, which can be purchased for a few cents from any chemical supply house, is placed in the center of the jar. A plate of carbon is placed in the outer jar and a zinc rod in the porous cup. These may be suspended from a wooden cover or two carbon rods and a zinc rod supported, as shown in the illustration. The zinc rod is amalgamated with mercury by first rubbing with a cloth dipped in dilute sulphuric acid and then applying mercury, which will coat the zinc and give it a shiny surface.

### Construction of Cell

To set up the cell, place two teaspoonsful of table salt in the porous cup and fill it three-quarters full with water. Into

(Continued on page 14)

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UV-201 ... 3.00	C-301-A ... 3.75
C-300 ... 2.50	UV-202 ... 4.00
C-301 ... 3.00	C-302 ... 4.00

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One of Chicago's oldest and largest exclusive radio stores sold more Mu-Rad Receiving Sets in 1922-23 than all other types of Receivers combined!

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To get complete details of our special Mu-Rad proposition will not obligate you. Write also for a copy of our handbook catalog of other profitable Radio merchandise. Write today before someone else in your neighborhood gets exclusive Mu-Rad privileges.

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Jobbers of Good Radio Merchandise  
General Offices: 407 South Dearborn CHICAGO

# Federal Standard Radio Parts

offer to the man who wants to "build his own" a selection from 130 different units, each of which is guaranteed.

Each part is made of the best material and given searching tests by our radio engineers.

If you want the best results use Federal parts throughout the set. They were designed and built to work together. One inferior part will impair the efficiency of the entire set.

*Insist on the name Federal on every part you buy. If your dealer does not stock them, a card will bring a complete catalog of the 130 Federal units and the name of the nearest Federal dealer.*

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Boston New York Philadelphia Chicago San Francisco  
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**ELECTRIC SOLDERING IRON**

EVERY RADIO FAN has been looking for this iron for both radio and home use. Operates on A. C. or D. C. current.

**\$2.28**

GUARANTEED one year. Sent anywhere in U.S. or Canada Parcel Post prepaid on receipt of money order for \$2.28.

Send 2c stamp for our list of RADIO BARGAINS

**RADIO BARGAINS**  
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# Circuit Using Loop Aerial or Ground

### Tuning Is Sharp and Simple—Not Critical

In the illustration is shown a circuit which is the result of six months' experimenting. The set in operation, using aerial and ground or ground alone on either aerial post or ground, brings in

### WORKSHOP KINKS? EARN A DOLLAR—

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

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

local stations loudly enough to operate a loud speaker. With the phones placed on the table, music and voice can be heard 40 feet away. Tuning is very simple, not critical. Most of the tuning on practically the same wave length is done with the vernier. The tuning is sharp and clear, yet it is not difficult to cut out the whistle or carrier waves.

The rheostat adjustment of the filament is not critical. The knob can be turned until the click is heard in the phones. Just before the click is the point of reception. The tube will not oscillate. A UV-200 in this circuit will surprise you by its stability and amplifying powers. The rheostat at about half on is the point for best operation.

The energy collector can be of any type, viz., loop, aerial alone, or both aerial and ground, two grounds, loop and ground, lamp socket aerial with or without ground, or with loop aerial or ground. The last named is not so good.

The vernier of the condenser and rheostat raise the volume tremendously when used for fine adjustment.

In justice to the circuit I would suggest a trial. The controls are minimum. It is adaptable to any kind of energy collector. I have received up to 250 miles on two 30-foot wires lying on the floor with the center of the wires to the ground, both ends being connected to the set, one at the aerial and the other at the ground post.—John W. McGrath, Jersey City, N. J.

### Bed Springs as Aerial

Bed springs and window screens sometimes work on crystal sets that are located under the shadow of the transmitting aerial, but there is nothing doing on this type of inductance at any great distance from the center of broadcasting, unless you use a couple of steps of Radio frequency before the detector unit. Bed springs as aerials for a crystal set five miles from the broadcasting station are as useful as a headache.

## WATCH!

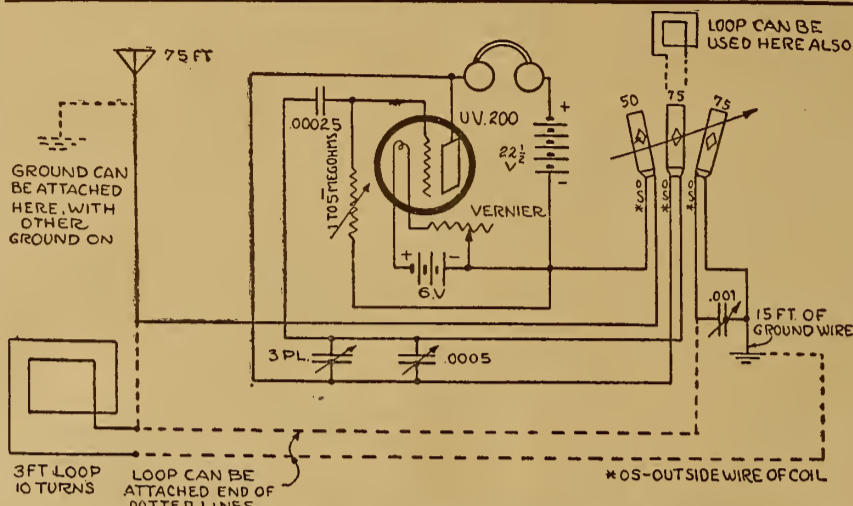
for the

# METALECTRIC SOLDERING IRON

"DESIGNED TO MEET THE REQUIREMENTS OF THE RADIO ASSEMBLER"

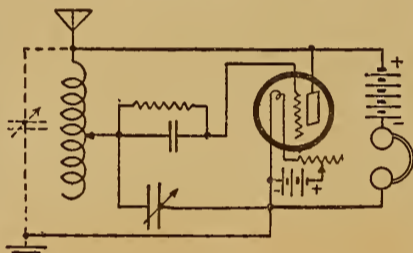
POST ELECTRIC CO.  
(Department 509)  
30 E. 42nd St., NEW YORK

### LOOP MAY BE USED AT TWO POINTS



### Slide Tuning Coil with WD-11

Illustrated herewith is a hook-up for a WD-11 tube, variable condenser and a one slide tuning coil. With a set using this hook-up I have tuned in stations WSB, KSD, KYW, KDKA, WMAQ, WDAF, WHB, WOAI, WWAC, WBAP and numerous other stations. I am using a 75-foot one-wire aerial, 100 turn tuning coil and 43-plate variable condenser. If higher wave



lengths are wanted a 23-plate condenser may be connected across the aerial and ground as indicated.—Russell J. Schembs, Peoria, Ill.

### Battery Connections

An A battery is connected in series with the filament, B battery in series with the plate, and C battery between the filament and secondary of the transformer leading to the grid.

### WD-11 TUBES

- UV-201A, UV-199 and WD-12.....\$5.30
- This is a wonderful saving on tubes, as they are all guaranteed firsts and in their original packages. Buy several spares at this attractive figure.
- \$12.00 Nath. Baldwin Phones, Type C.....\$8.35
- 8.00 Brandes Superior Phones..... 4.45
- 5.00 Era Reflex Transformer..... 4.15
- 4.50 Thordarson Audio Transformer—Ratio 3 to 1 and 6 to 1..... 2.85
- 2.00 Filkostat..... 1.80
- 1.00 Hook-ups..... .25
- 27.00 Michigan Midget. A wonderful One-tube Set.....\$18.95
- Everything guaranteed as firsts. Don't delay getting price list No. 9. Wonderful bargains. We pay postage.

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SHEETS TUBES RODS  
RADIO PANELS  
POLISHED BLACK FINISH

CUT PERFECTLY SQUARE TO ANY SIZE

- 1/32" THICK 1/2¢ PER SQ. INCH
- 1/16" THICK 3/4¢ PER SQ. INCH
- 3/32" THICK 1¢ PER SQ. INCH
- 1/8" THICK 1 1/2¢ PER SQ. INCH
- 3/16" THICK 2¢ PER SQ. INCH
- 1/4" THICK 2 1/2¢ PER SQ. INCH
- 3/8" THICK 4¢ PER SQ. INCH
- 1/2" THICK 5 1/4¢ PER SQ. INCH

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### How to Hold Dials Firmly

It often is difficult to make dials or knobs hold firmly in place on such instruments as variometers, rheostats and the like, because the shafts are too smooth. This may be overcome easily by filing one side of the shaft slightly, making a flat surface. Place the tightening screw over the flat space. Adjust it firmly; the dials will be held in place.

### Use Wire for Aerial Support

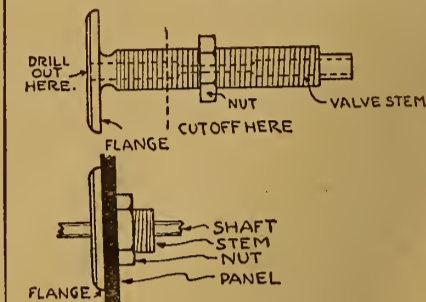
Use the same kind of wire for stringing up insulators that is used for the antenna itself. Rope will stretch and shrink with changes in weather and will cause the antenna to sag or tighten up.

### Radio Equipment

EDISON Elements for making "B" Batteries, 6c per pair; tubes, 2c each. Nickel Wire, Insulators and Cabinets at reasonable prices. TODD ELECTRIC CO., 178 Lafayette St., New York City.

### Panel Bushings Made of Automobile Tire Valves

For those of you who "make your own" the following kink may be of interest. Procure one or more inner tubes from a garage, if you do not have an old automobile tire. Take the valve stem out of the tire and put it in the vise with the flanged end in front. Run in a 3/8 or 1/2-inch 7/8 or 1/4-inch. Drill the hole in 1 inch inch drill, depending on whether the shaft or more and cut the flanged end off the



right length. The illustration is self-explanatory.—W. J. Sherid, Central Point, Oregon.

From time to time the aerial should be lowered, and the insulators should be cleaned off to avoid leakage.

### Coast to Coast on One Tube and No Body Capacity

These popular hook-ups use UV-199, WD-11 or WD-12 Tubes. One hook-up gives selectivity and 1500 miles with absolutely no body capacity, while the other gives the remarkable distance of coast to coast. Both prints postpaid for 50 cents or any of the above tubes postpaid \$5.45. Formerly operated by C. W. Kautz. We welcome his customers. No stamps accepted.

Radio Outfitting & Supply Co.  
Box 1107 LANCASTER, PA.

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**COCKADAY**  
Complete parts for this wonderful circuit; only best material used. Guaranteed to work properly. Special complete. **\$13.95**

**MORRISON Loud Speaker**  
unit. The world's best loud speaker unit; will fit any horn or phonograph. Adjustable tone and has volume of any \$30 loud speaker. Sold on a money-back guarantee. **\$10.00**

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\$16 N. & K. 6000 Ohms, made in Germany...	6.50
\$12 Nathaniel Baldwin.....	9.95
\$8 Brandes Superior.....	5.45
\$6 Nath. Baldwin Single.....	4.95
\$7 Rico 3000 Ohms.....	4.75

### VARIABLE CONDENSERS (Moulded Ends)

List	Our Price
3 Plate.....	\$2.00 \$1.25
11 Plate.....	3.50 1.75
17 Plate.....	4.00 1.95
23 Plate.....	4.00 1.95
43 Plate.....	5.00 2.25
11 Plate Vernier.....	6.00 3.25
17 Plate Vernier.....	6.00 3.25
23 Plate Vernier.....	6.60 3.50
43 Plate Vernier.....	7.50 3.95



**REINARTZ**  
We specialize in the Reinartz Circuit. Complete standard parts. We guarantee results. **\$10.45**

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\$25 Atlas.....	\$17.50
22 Pathe.....	17.50
30 Music Master.....	24.95
35 Magnavox R3.....	27.50
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One-tube Regenerative set.....\$19  
Two-step Amplifier in mahogany cabinet..... 17  
Two-tube portable set..... 40  
Two-tube set..... 26

**D. V. 6 A DeForest Tubes**  
Use .25 of an amp. The popular DeForest Tube. Regular \$6. **Special \$4.50**

### TUBES

WD-12, WD-11, UV-201A, UV-199, C-301A.....	\$5.75
UV-200.....	\$4.50
VI-2.....	\$7.45

### PANELS—1/2" Thick

Hard Baked Rubber lite	Hard Baked Rubber lite
7x10.....\$0.95 \$1.35	7x18.....\$1.65 \$2.45
7x12..... 1.25 1.60	7x21..... 1.85 2.75
7x14..... 1.40 1.95	7x24..... 2.15 3.25

**CABINETS**  
Extra fine quality—Hinged top—Mahogany finish.  
7x10.....\$2.75 7x18.....\$3.50  
7x12..... 2.95 7x24..... 3.95  
7x14..... 3.25 12x14..... 3.95

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64x New York Retail Stores Add Parcel Post Do Not Send Stamps  
208 page complete Radio catalogue free with orders of \$5.00 on request. Otherwise prepaid for 25 cents.



# Five Tube Neutrodyne Receiving Circuit

## Part III—Assembly and Wiring

By H. J. Marx

TO THE writer the assembly and wiring of a receiving set always offers the most fascinating part of the work. The panel layout is simply the result of proportioning correctly the location of instruments on the panel and sub-panel but the assembly and wiring give free scope for a display of fine work-

ends; hold in place by looping a few turns of string around it. In this manner the plates will not be turned out and knocked against in the assembly of other apparatus.

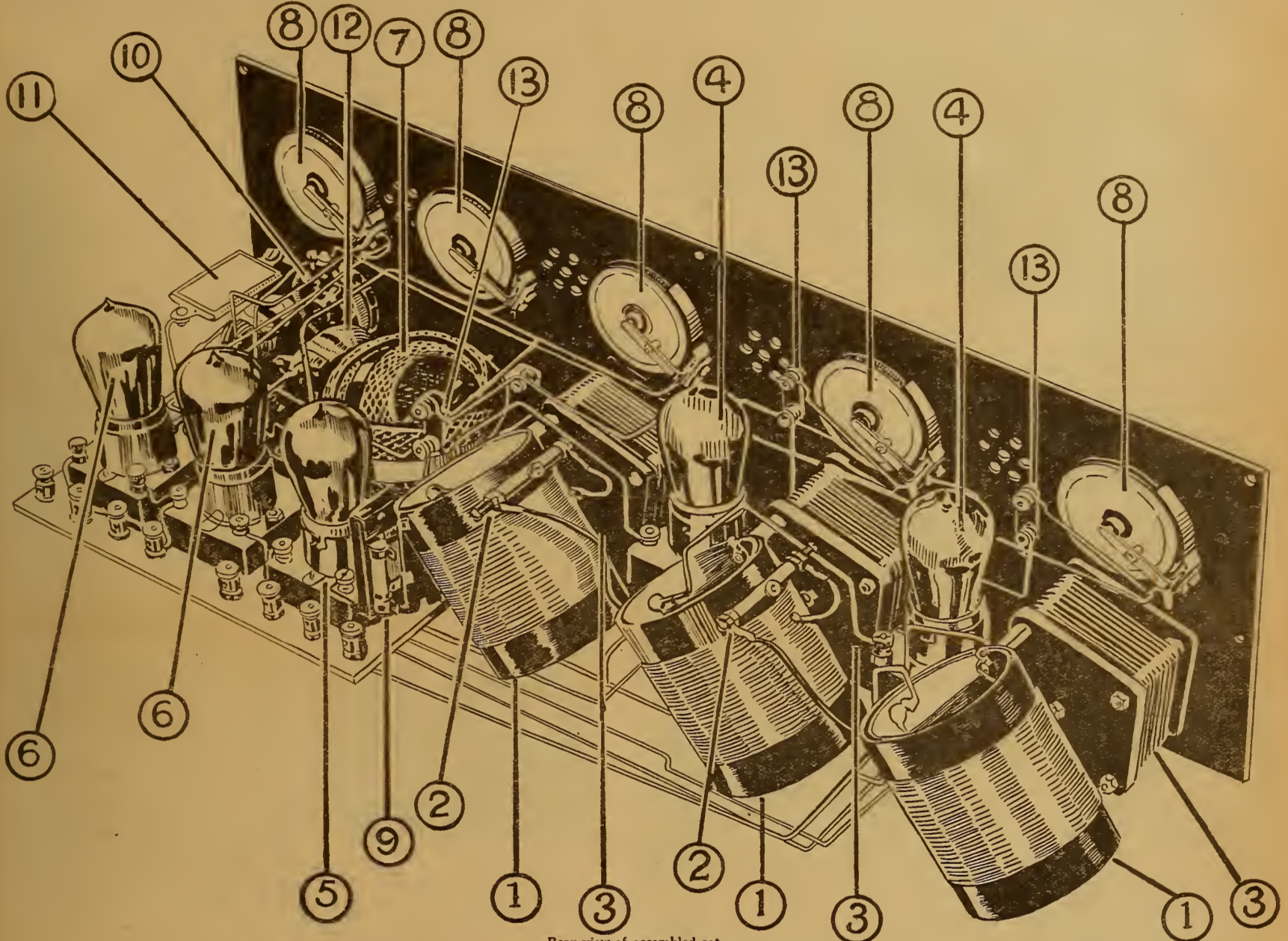
In order to mount the two neutrodynamic in the most logical place and to establish the most convenient proximity to the

### Sub Panel Apparatus

The socket for the detector tube 5 and the two amplifier tubes 6 are first mounted, then the two small audio-frequency transformers 12. These transformers are shown more clearly in the side view of the sub-panel.

The eight binding posts are then

the two jacks and the variometer jack switch. The two screws, clamping the jack springs in place, must first be removed but care must be taken not to loosen the mica insulating spacers from the insulation tubing through which the screws pass. If possible procure six brass machine screws which will have



Rear view of assembled set

manship and neatness in appearance. From old, the true craftsman has always taken pains to make each job better than the latest. Quoting from Longfellow—"Each minute and unseen part, for the gods see everywhere."

Just because the set is enclosed in a cabinet and only the exterior of the panel and its control dials is seen, furnishes no reason for neglecting the interior. The true fan takes the greatest pride in displaying what's on the inside of the "mystery box"—the real machinery that collects from apparently empty air, the entertaining programs and offers them to the listeners.

### Mounting the Apparatus

The neutroformers, consisting of the Radio frequency transformer windings, attached to the variable condensers, are mounted on the panel first. More plates are bent and the condenser short circuited in the assembly of the apparatus than in any other handling. For this reason, the following "kink" will be found of considerable advantage: turn the rotating plates until they are fully inside of the fixed plates, then wrap long strip of paper around the plates inside of the

coils for shortest leads, holes were drilled through the tubing of the second and third neutroformers. The neutroformers were then fastened by means of machine screws passing through these holes. This is clearly indicated by the encircled 2 in the illustration of the rear view of the panel. The neutroformers are indicated by the numerals 1 and 3.

The panel mount sockets for the Radio frequency amplifying tubes 4 are next mounted in place.

The five rheostats (8) are then mounted, after which the potentiometer (10) and the variometer (7) can be added.

The anti-capacity switch, which can't be seen in the rear view, is then added, likewise the battery and the variometer switches and the two jacks. The proper location of the jacks and battery switches can be determined by means of the hookup diagram in Part I of the series and the panel layout in Part II.

added; if desired, indicating name plates can be inserted under each post.

In order to mount the grid leak and condenser, shown as number 9 in the rear view, a small brass angle is fastened under the thumb screw of the grid post of the detector tube socket. The condenser and leak are then fastened to the angle by means of a machine screw and nut which at the same time make contact with the one terminal of the condenser and leak. The angle closes the circuit to the grid binding post.

### Mounting the Sub Panel

The sub-panel must next be mounted on

the same threading as those removed, or a smaller size with nuts which will pass through the holes. If they are too long they can be cut off after being screwed tight. The panel is then put in place over the jacks and the screws passed through the proper holes and tightened up in the jacks or by means of nuts on lower side as shown in side elevation.

(Continued on page 14)

### WD-11 and WD-12 TUBES REPAIRED

WD-11 or WD-12.....	\$3.50
C-300 or UV-200.....	2.75
C-301 or UV201.....	3.00
C-302 or UV-202.....	3.50
C-301A or UV201A.....	3.50
Moorehead Detectors.....	2.75
Moorehead Amplifiers.....	3.00
DV-6 or DV-6A.....	3.00
Also the new UV-199.....	3.50
NEW DX 1 1/2 VOLT TUBES.....	4.00

All tubes guaranteed to work like new.

Mail Orders Given Prompt Attention "24 Hour Service"

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55 Halsey Street Newark, N. J.  
TUBES SENT PARCEL POST, C. O. D.

### COMPENSATING CONDENSER



is a special three-electrode condenser for balancing the grid charge on the amplifying tubes. Stops all local oscillations without detuning the amplifier. Shielded against hand capacity disturbance.

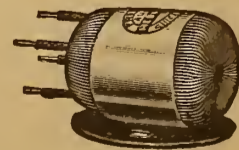
\$3.00 Complete

For Use with Tuned Radio Frequency Receivers

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### PREMIER "HEGEHOG" TRADE MARK

### AUDIO FREQUENCY TRANSFORMER



PAT. PEND.

HALF SIZE

MAXIMUM VOLUME MINIMUM DISTORTION 100 PER CENT SHIELDED MOUNTS ANYWHERE

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RATIOS—1 to 3, 1 to 4, or 1 to 5

The Most Efficient, Compact Transformer ever designed. Ask Your Dealer for the Premier "Hegehog."

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### Crystal Tube Detector

Replaces crystal and cat whisker. Always set and alive, loud and clear. No more fishing for live spots. Guaranteed to detect perfectly. Simple to connect—full instructions. Needs no batteries and never burns out. Made of the famous B-Metal. Sold by all live dealers or can be ordered from

The B-Metal Refiner Co.  
3134 Trumbull Avenue  
Detroit, Mich.

Price \$1.50



**FIVE TUBE NEUTRODYNE**

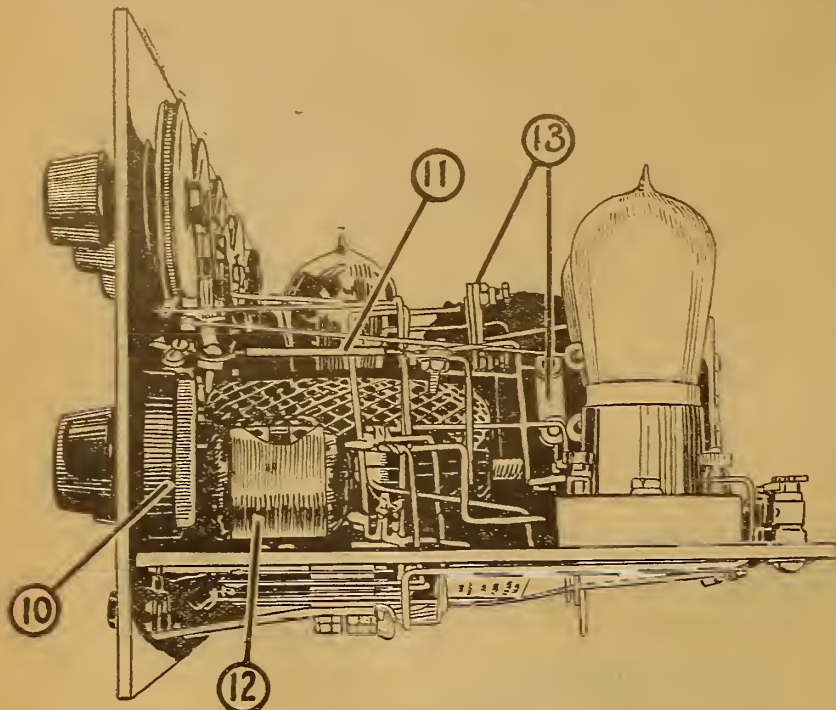
(Continued from page 13)

The assembly and mounting of the apparatus is now complete with the exception of the fixed condensers, for example number 11, which are placed in

corrosive and leaves a neat clean electrical joint.

**Wiring**

In wiring, all filament and A battery leads should be inserted first. The grid and plate leads on the Radio frequency



Side elevation, showing mounting of sub-panel

position during the wiring operations.

**As to the Fuses**

In the set that was constructed, before this article was prepared, five 1/2 ampere fuses were used as indicated by the numerals 13 in the illustration. They are not indicated in the hook-up diagram nor called for in the parts list but, if desired, are connected in series between the rheostat and the filament terminal of the lamp socket.

**Soldering Solution**

Most of the soldering pastes at present on the market are likely to contain corrosive chemicals which in time affect the electrical connections in the joints and introduce unnecessary resistance in the circuit. Before taking up the wiring, the following formula for a good Radio soldering flux is suggested:

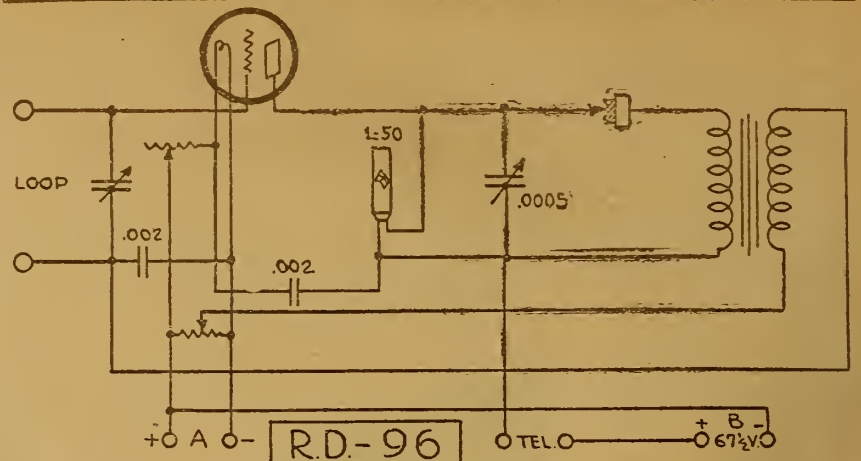
Mix four parts by weight of resin with one part of wood alcohol. When dissolved the solution makes a flux which is non-

side are next in line. The shorter leads to the anti-capacity switch should then be added but the long leads to the binding posts should be put in last.

The next step is to complete all the short leads on the sub-panel side. Here again the long leads should be kept till last. When adding the condensers, don't solder the wires to them, but pass machine screws through the holes of the lugs; by looping the wire, the leads can be clamped firmly without incurring the danger of shorting the condenser in soldering.

In adding the long leads as the final operation, spaghetti can be passed over the leads wherever there is any possibility of contact between leads. The writer uses only stiff brass bus wire and adds no spaghetti except where there is a chance of short circuit. This improves the appearance of the work, especially if care is taken in the running of leads.

**INEXPENSIVE SINGLE TUBE SET**



An inexpensive circuit working well with loop aerials always appeals to those fans who find Radio a decided drain on finances.

The parts required are not too numerous and the circuit is very efficient. Two variable condensers, .0005 mfd. capacity, are used for tuning.

A potentiometer permits best adjust-

ment of grid potential for whatever type of amplifier tube is used.

The diagram, R. D.-96, calls for a 50-turn honeycomb coil, but for broadcasting stations of higher wave lengths this can be changed to a 75-turn coil. Two bypass condensers of .002 mfd. capacity are indicated. The plate battery voltage should be about 67 1/2 or three 22 1/2-volt units.

**Grid Leak Is Not Essential**

The grid leak is not always essential in some circuits, and if a proper inductance is used even this part will act as a grid condenser. A secondary condenser will also sometimes do this, and the capacity of the secondary coil will also help. With some tubes the Radiophan may be able to "get away" without either part. The tube will be very unstable, however; at least a condenser should be used. A small vari-

able condenser will be of considerable assistance.

**Reinartz Coil \$1.85**

The Improved Basket Weave, Covering All Broadcasting Wave Lengths

With each coil we send FREE two large blue-prints, picture hookup and panel layout. List of materials, and fully illustrated instructions for construction and operation.

Buy before the fall rush sets in

We sell all parts required for this wonderfully efficient receiver—panel, coil, condensers, socket, vernier rheostat, variable gridleak, dials, switches, posts, contact points, wire, spaghetti, etc. (no tubes or phones) for only \$9.85. Postage additional on all shipments.

Send no money PAY THE POSTMAN. All Goods Shipped Parcel Post C. O. D.

RADIO SURPLUS STORES, Helena, Montana

**YOU DON'T NEED**

**Tubes**

to get out of town. Even in the summer I hear Omaha, Kansas City, Fort Worth and Davenport on my crystal set without amplification. Works over 1,000 miles in winter. Send self-addressed envelope for further information or \$1.00 for complete copyrighted drawings and instructions. Everything clearly explained. Satisfaction GUARANTEED. Leon Lambert, 50 South Volutsia, Wichita, Kan.

**FIRST STEPS IN RADIO**

(Continued from page 11)

The jar pour a solution made by mixing 3 ounces of potassium bichromate, 1/2 pint of sulphuric acid and 1 quart of water. Mix the acid and water first and add the bichromate. The level of the solutions in the porous cup and jar should be the same. The zinc and carbon rods may now be inserted and the cell put into service. This cell can be put in some out of the way place and left until exhausted, when it is necessary only to renew the zinc and solution to give it a new lease of life. These cells can be purchased from electrical supply houses, ready to set up and use. This is perhaps the cheapest form of primary battery and will give good service where it is possible to use a battery containing liquids.

The common sal-ammoniac battery can be converted to the bichromate type by using a porous cup to separate the zinc and carbon, as shown in Figure 59. The porous cup fits inside the carbon cylinder, as shown, and the solution mentioned above may be employed. This is an inexpensive form of construction which should appeal to the experimenter.

(TO BE CONTINUED)

The purpose of a C battery is to provide the correct negative charge to the grid.

**USE VAN'S LIQUID COPPER**

for shielding back of panels, etc. Eliminates body capacity. Van's Liquid Copper takes the place of sheet copper or aluminum. Easily applied with a brush—no cutting, drilling, soldering or waste. One bottle covers 400 square inches; mailed to you for \$1. Send a Dollar bill today.

THE VAN LABORATORY

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Every radio fan needs this Pocket Voltmeter. Tests "B" Batteries up to 45 Volts. Guaranteed accurate. Sent anywhere in U. S. or Canada. Parcel Post Prepaid, on receipt of money order for \$1.49. Indian Head Pocket Ammeter at same price. Fans send 2c stamp for our list of Radio Bargains.

INDIAN HEAD COMPANIES

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- WD-11-12, UV-199, UV-201-A, C-301-A ..... \$3.50 each
  - UV-200, C-300, AP Detectors ..... 2.75 each
  - UV-201, C-301, AP Amplifiers ..... 3.00 each
  - DV-6, DV-6-A ..... 3.50 each
  - UV-202 ..... 4.00 each
- And Guarantee Them Equal to New
- QUICK SERVICE—Include with your order remittance to cover repair plus parcel postage for one pound per tube. If preferred, tubes will be returned C. O. D. repair charges.
- ABALENE RADIO, 14 Vesey St., New York, N. Y.

**AMPLEX GRID-DENSER**

A Variable Condenser (.0005) for the Grid Circuit



"Use in our laboratory."—Prof. L. A. Hazeltine.  
"Works like a charm."—Dallas Times-Herald.  
"Delighted with results."—Scientific American.

Approved and recommended by Radio Laboratories of Radio News, Radio World, New York Mail and other experts.

DOUBLE THE EFFICIENCY OF YOUR SET  
Greater distance  
Sharper tuning  
Louder and clearer signals

PRICE \$1.25

At your dealers—otherwise send price and Grid-Denser will be sent immediately.

AMPLEX INSTRUMENT LABORATORIES  
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"SENIOR" SET

Each the best of its class; and all three backed by the guarantee of a responsible House.

**Michigan "Senior"**

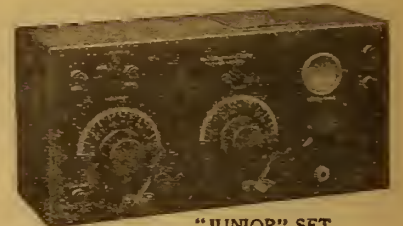
includes Detector and two stages of amplification. For trans-continental loudspeaker or headphone reception. Price, without tubes \$125.00 or accessories .....

**Michigan "Junior"**

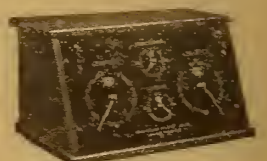
A Detector Set, for headphone reception only. Price, without tube \$57.50 or accessories .....

**Michigan "Midget" Receiver**

Built to supply the demand for a portable outfit for vacationists; but has performed such long distance wonders that it is being adopted everywhere as a year-round receiver. Uses any style of tube. Price, without tube.....\$27.00



"JUNIOR" SET



"MIDGET" SET

Also ask about the "Michigan" Two Stage Amplifier and our exclusive line of Condensers, Variocouplers, Variometers, Rheostats, etc. Every instrument fully guaranteed. When you send for circular, give us the name of your favorite radio dealer.

**MICHIGAN RADIO CORPORATION**

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# Questions and Answers

### Loss of Efficiency

(4200) RL, Toronto, Canada.  
My set, which is a triple coil with a WD-11 tube, was very sensitive when I first set it up (home-made), but since it has been gradually fading away until lately, when the wave lengths were changed, I cannot get much of anything; then it is very distorted and faint. I had a list of 72 stations to date, an aggregate mileage of 29,890. At present it usually picks up WDAP and WJAZ with good volume; all others are faint, very faint. I have resoldered all connections and changed and tested the battery, but to all appearances it is the same old set.

Could it be the fault of tube getting old? Is it in the grid condenser?  
Could you tell me which is the most sensitive one-tube hook-up?

Have you or are you going to give instructions on how to make a multiplex wave variocoupler?

I have constructed from your instructions a Reinartz tuner without success. Is it absolutely necessary for a B battery of 60 volts?

Is it advisable to construct a cabinet to contain all sets in one, that is, putting in a triple coil, a variometer and variocoupler, a Reinartz and a Flewelling, also a crystal single circuit coil all on one panel? Would they have much inductance from one another, and would the dead ends have much effect? I would like to arrange them so as to be able to switch from one to another.

A.—Many factors may be the cause, although it is impossible to determine without a personal inspection. It may be that the antenna or the ground connections are corroded. It is often found that weak signals are due to the set oscillating below a critical filament temperature. This can be determined by increasing the temperature above the oscillating point when signals will increase in audibility, but become more and more distorted. In such case use less plate inductance, less B battery, higher antenna capacity, lower phone by-pass capacity. The grid condenser may be shorted.

Either the Reinartz or single circuit tuner is a very sensitive type of receiver. B potential depends upon the tube used. If a UV-200 is used, 22½ volts is sufficient. If a 201, 20-A, 21 or UV-199, 45 volts are indicated. Sixty volts is used only in the case of amplifier tubes.

We have not as yet published instructions for making the multiplex wave coupler. It will have our attention as space permits.

It would not be at all advisable to follow your plan of combining in the cabinet the several circuits mentioned on account of capacity losses, dead end losses and the like.

### Cage Aerial

(4187) WB, New York, N. Y.  
I would like to know more about the hoop aerial. Will you please tell me as to the diameter of the hoop and the number of wires? What is the best length of wire between each hoop and kind to use? Will a hoop aerial receive distant as well as local stations better than a single wire? Is it directional? What is the best position?


A.—No type is as effective for reception as the single wire; it makes a circuit just as effective as any and far more selective. However, the hoop or cage antenna of which you inquire consists of four to six wires on 4-inch rings. It is effective only for transmission.

An aerial is directional off the lead-in end. Possibly an east and west direction with lead-in off the west end would be most favorable in your location.

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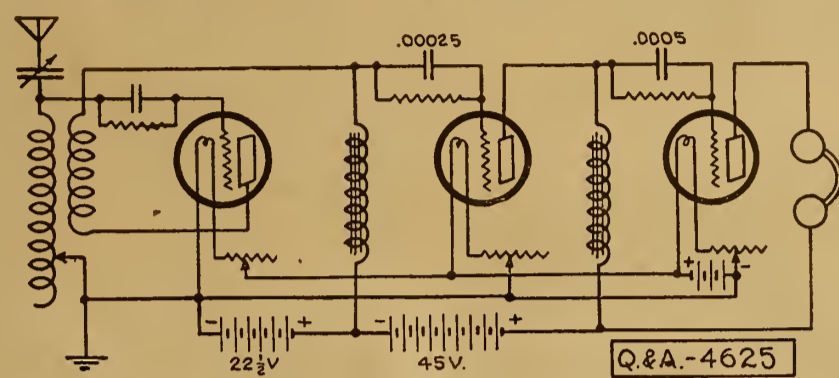
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### Choke Coil Amplifier

(4625) CWC, St. Joseph, Mo.  
Have had constructional data for building amplifying chokes from Ford spark coils for some time, but could find no one in this "neck of the woods" who knew anything about the hookup. Thanks to the



Digest, which I read, ads and all, regularly, I am beginning to see the light, but not quite. I would like to place the two-stage circuit shown in Figure 45, page 11, Radio Digest, in a separate cabinet for use with my single-circuit regenerative receiver. How will I connect them up? Could UV-199 tubes be used?

A.—Complying with your request, we are presenting detector and amplifier circuit. UV-199 tubes can be used.

### Crystal Set

(4221) CD, Kimmunity, Ill.  
I have a crystal set consisting of a two slide tuner, galena detector and phones. My aerial is number 14 wire 175 feet long with a 100 foot leadin. Before May 15th I could hear the stations that were broadcasting on 360 meters to 485 meters. Now I can hear only KSD which broadcasts on 546 meters. Although there are several stations send out on 360 meters and higher. Will you please advise where to locate my trouble?

A.—Noting your specifications and limitations experienced we are advising that it may be that the crystal detector has lost its sensitivity to some degree. It can be washed with soap and water to remedy the condition. It is not our opinion that your difficulties of reception are due to the new wave length. You should be able still to tune to 360 meters wave length.

### Neutrodyne Circuit

(4568) KM, Detroit, Minn.  
I would like to know if a loop aerial can be used with a Neutrodyne circuit? If so, how?  
I would like to know if UV-199 tubes

can be used with good results in a Neutrodyne circuit?

A.—A loop aerial may be employed merely by substitution for the secondary of the variocoupler.

The UV-199 can be used although it is not as efficient as the six-volt tube.

### Tube Action

(4551) MLM, Chamberlain, S. D.  
My tube has not performed correctly since I had it repaired. I have a WD-12; a blue glow is in the tube when using it. This was not noticeable before I had it repaired. To hear anything I have to tap or vibrate the tube. When I do this the signals are heard but soon they die away and I have to tap the tube again. I have a new WD-12; this works fine showing that there are no loose connections in the set itself.

A.—The action of tube is due to the fact that the filament is not quite so good as before the repair was made. However, almost similar results may be obtained if you lower the plate potential until the blue glow disappears. Possibly

### PATENTS ON RADIO

Can you secure a patent on your Radio invention? Does your apparatus or circuit infringe existing patents? These questions and others can be answered promptly by consulting my special library of Radio patents compiled to assist Radio inventors and manufacturers. Send for booklet on Radio patents.

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a decrease of ten volts will be sufficient, although experimentation will best determine the most effective point. When a blue glow is present it is indicated that ionization is taking place and the tube will not function as a detector until it is eliminated.

### Trouble in Reinartz

(4535) JBC, Derry, Pa.  
I have a Reinartz set and two-stage amplifier which at times work very well, but there seems to be much trouble in the detector which I cannot locate.

At times there is an excessive amount of frying and cracking in the phones, which makes it impossible to put the phones near the ears. At other times it stutters and chops the music or voice and makes clear reception impossible. When receiving on a high wave (over 500 meters) it mashes the sound, which cannot be understood at all. This trouble is in the detector, not the amplifier; I have tested it in every manner that I know.

Ground is a cold-water pipe; aerial—have tried all kinds, inside and out; batteries—22½ volts on detector (UV-200 tube) and 45 volts on detector (two C301-A tubes); tube controls—Filkostats.

Local reception comes in good, but it is the distant stations which give me trouble. A.—Without the privilege of personal observation, we are venturing the opinion that this is due to improper adjustment of the grid leak. We suggest that a few pencil lines between the grid and filament contacts on the base of the tube UV-200 will eliminate the annoyance.

Exceptionally long distances are heard late at night or early in the morning.



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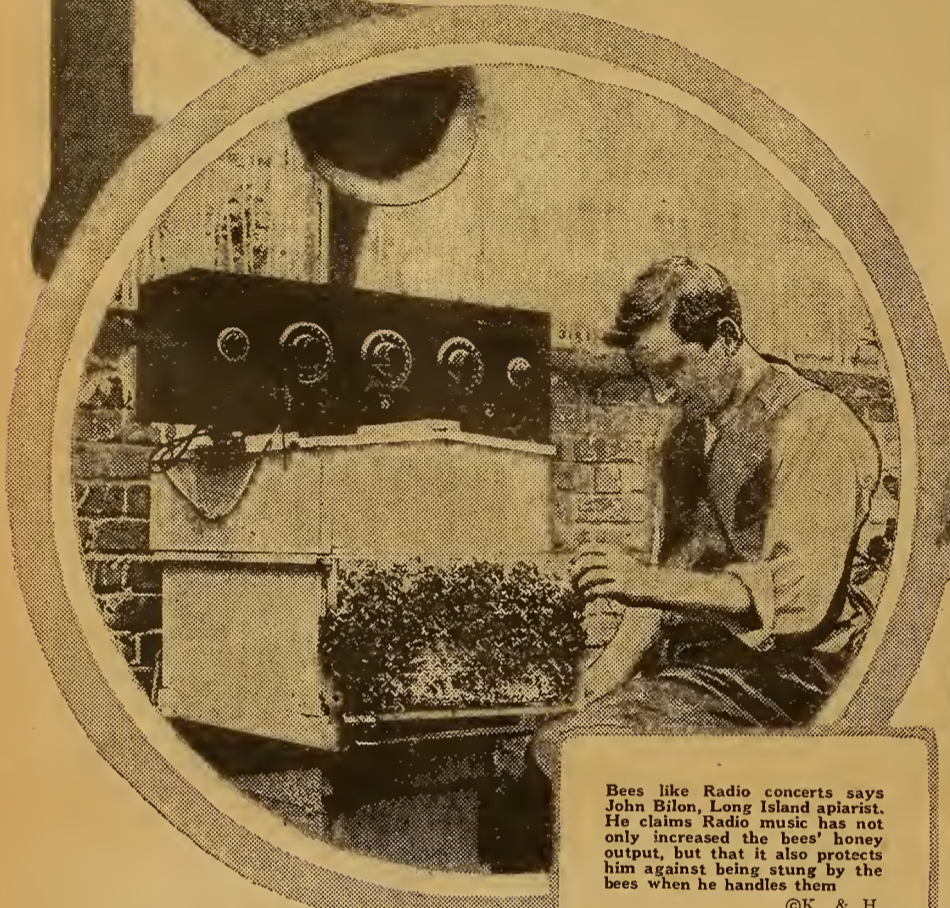
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# Daddio

## Illustrated

Field Marshal Haig broadcasts a message to British citizens over Station 2LO, London  
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Bees like Radio concerts says John Bilon, Long Island apiarist. He claims Radio music has not only increased the bees' honey output, but that it also protects him against being stung by the bees when he handles them

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Emil Roeder is only one of the many young members of the Chicago Boys' Club who have made their own receiving sets from antenna to phones. The youth of the land is finding excellent use of its time constructing sets, and the Boys' Club is helping along the interest of the boys by training them in Radio © U. & U.

