

Radio Digest

EVERY WEEK

Illustrated

TEN CENTS

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

Vol. VII

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SATURDAY, NOVEMBER 3, 1923

No. 4

“MOVIES ON AIR SOON”

SQUIER SAYS ADS ALSO TO BE ON ETHER

Predicts Changes Soon

**Famous Major General in Interview
Says Broadcasting Is Enter-
ing New Phase**

(By L. M. Lamm, Staff Correspondent)

WASHINGTON.—“I believe we are on the threshold of a new movement of photo broadcasting, both still pictures and movies,” said Major General George O. Squier, chief signal officer of the U. S. Army, in a recent interview with the writer. Major General Squier continued his fore-

“Every day sees some new application of broadcasting and we are already developing artists to transmit efficiently and
(Continued on page 8)

LOTS OF SONG HITS FOR BROADCASTERS

**MUSIC TRUST LOSES COUP
IN ATTEMPTED GRAB**

**Plant Owners Meet, Elect Officers and
Laugh at Fizzle Opponents
Made of Things**

NEW YORK.—The music problem confronting broadcasters has been solved! Song hits, not necessarily controlled by the American Society of Composers, Authors and Publishers, tax free music, literally speaking, is being released weekly to the broadcasters, and is more popular among Radiophans than any formerly controlled by the “music trust of tin-pan alley,” which for the past year has endeavored to collect large sums from stations for the so-called privilege of popu-

China Builds Stations; Disputes Broadcasting

**Plan Big Radiotelegraph Plants
but No Radiophones**

WASHINGTON.—China will soon have five commercial Radio stations and may also develop broadcasting, according to recent information received here. Contracts have been signed for a powerful station, similar to the French Lafayette Station, to be built at Shanghai, and four others of lower power to be located at Peking, Harbin, Canton and Shanghai. They will be built by the Federal Telegraph Company. The last four will serve as feeders for the big Shanghai trans-Pacific station.

Four attempts to establish Radio broadcasting in China have been made at Shanghai, and although one fifty-watt set is still in operation, the right to continue is questioned by the Chinese Ministry of Communication.



CJCA Spreads Dr. Coue's “Day by Day” Doctrines

EDMONTON, ALTA.—“My life is getting better and better every day and in every way,” Radiophans of the West joyfully exclaimed as they tuned in on CJCA, the Edmonton Journal plant here and listened to Professor P. R. Plisson, of Paris, France, noted professor of auto-suggestion, speak over CJCA. Prof. Plisson, who is a pupil of Dr. Emil Coué, whose famous health giving phrase was on the lips of millions daily for months, was speaking to capacity audiences in Edmonton when CJCA invited him to entertain Radiophans.

larizing and aiding the sales of their songs. Great joy reigned here at the recent meeting of the National Association of Broadcasters, in connection with the New York Radio Show, when the broadcasters' association surveyed the great achievement it has been able to accomplish in its righteous fight with the mercenary inclined “music trust.” The broadcasters are really having fun now, watching the frantic efforts of “pluggers” (singers paid by members of the trust) to get their selections before the public via the ether route.

More than one hundred potential hits are already in the hands of the broadcasters, who, with this evidence to support their statement, say that a shortage in popular music is an impossibility. The National Broadcasters' Association, in fact, intends

(Continued on page 8)

400 YEARS OLD BUT STILL MAKES MUSIC

CLEVELAND.—A unique treat was given the WJAX audience recently when Professor Kessler, of the Oberlin Conservatory of Music, Oberlin, Ohio, played selections upon a viole d'amour or “violin of love.” Prof. Kessler's instrument is over 400 years old. This form of musical instrument was common in the seventeenth and eighteenth centuries.

Looking down from the top we have first Susan Hart, a promising little musician who often delights the audience of the Woodmen of the World station, WOAW, Omaha, with her piano numbers. Next comes pretty Agnes Morrissey of the “Little Jessie James” cast, recently on the air at WJZ, New York City. To the right is Carroll McComas of the “Jolly Roger” company—she looks a bit mischievous, doesn't she?—in costume. A performance of the play has been broadcast by WOR, Newark, N. J.

INTEREST IN PARTS OFFER STILL RISING

NUMBER OF INQUIRIES CONTINUES TO GROW

Changes in List of Accessories Printed Here Make Use of Last List Imperative

SPECIAL REWARD OFFER

Coupon Number 23

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

Interest continues to grow in the Radio Digest's special offer. The number of series submitted by readers desiring parts for the construction of sets constantly increases.

Radiophans of this and other countries in which Radio Digest circulates may avail themselves more fully of the opportunities which Radio affords by taking advantage of the parts offer as it appears in detail below. Please remember that changes in devices occur often and on that account the latest issue of Radio Digest must always be consulted.

The parts will be sent to you as soon as we receive your letter.

Rules to Remember

One point must be emphasized to those contemplating taking advantage of this 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 .0025 mfd. Built-up Mica Condenser; 1 Schindler .001 mfd. Built-up Mica Condenser; 1 Schindler .002 mfd. Built-up Mica Condenser; 1 Schindler .0025 mfd. Built-up Mica Condenser; 1 Schindler .0025 mfd. Built-up Mica Condenser; 1 Martin-Copeland Sta Put Plug; Walnut Standard Tube Socket; Walnut UV-189 Socket; Dubilier Mica Condenser Type 601 (.0001, .00025, .0005, .001, .002, .0025, .003 or .004 mfd.); Premier Variable Condenser (.00025 or .0005 mfd.); Premier Variadon Inductance; 1 Carter 25-ohm Resistance Unit; Standard Socket Adapter for Delta Midget Tube; Electrad Grid Leak (1 or 2 megohms, with clips); Amisco 3-inch Dial; Amisco Inductance Switch; Freshman Micon Condenser (.0005, .00025, .00055, .0005, .001, .0015, .002, .0025, or .003 mfd.); Teleradio V. T. Socket; Metal Mounted Crystal; Aerovox Lightning Switch; Aerovox Series Parallel Switch; Aerovox Contact Lever; Na-Ald Small Space Socket; Se-Ar-De Vernier Adjuster; 3" Radion Dial, black; 2 1/2" Radion Dial, black; 3" x 1" Radion knob with shafts, 3/8" or 1/2", 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, Three Spring Closed Circuit; 1 Carter Hold-Tite Jack, Four Spring Closed Circuit; 1 Carter Hold-Tite Jack, Five Spring Filament Control; 1 Federal Universal Phone Plug; 1 Federal Open Circuit Jack; 1 Federal Closed Circuit Jack; 1 Federal Double Circuit Jack; 1 Martin-Copeland 5-pin Grip Plug; 1 Martin-Copeland WD-11 Socket; 1 Martin-Copeland WD-11 Adapter; 1 Martin-Copeland UV-189 Socket; 1 Martin-Copeland UV-189 Adapter; 1 Martin-Copeland Pull Switch; 1 Carter Martin-Copeland 5-point Inductance Switch; 1 Carter "Tu-Way" Plug; 1 Martin-Copeland SPST Knife Switch; 1 Martin-Copeland DPST Knife Switch; 1 Martin-Copeland DPDT Knife Switch; Walnut Variable Grid Leak; Walnut Inductance Switch; Dubilier Micon Type 600 (.0001, .00025, .0005, .001, .002, .0025, .004, or .005 mfd.); Dubilier .005 mfd.; Dubilier Mica Condenser Type 601 (.0005 mfd.); Premier Universal Tube Socket; Premier Radio Dial (3/4, 1, or 1 1/2 in. black or white face); Premier Universal Radio Jack; Open Circuit; Premier Universal Radio Jack, Two Circuit Three Springs; Premier Universal Radio Jack, Two Circuit Four Springs; Premier Universal Radio Jack, Filament Control Three Springs; Premier Universal Radio Jack, Filament Control Three Springs; Premier Switch Lever and 10 Points; Amisco Condenser; Freshman Variable Resistance Leak (with or without condenser); Freshman Micon Condensers (.0005 or .0005 mfd.); Teleradio 6-Ohm Rheostat; Teleradio 30-Ohm Rheostat; Teleradio Lightning Ar-Adjustable Detector Type D; Aerovox Rheostat; Se-Ar-De Vacuum Tube Socket; 3/4" Radion Dial, black; 4" Radion Dial, black; 4" Radion Dial, 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 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 Series 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 .00008 mfd.); Dubilier Ducon; Dubilier Micon Type 600 (.0005 mfd.); Dubilier Micon Type 610 (.01 or .02 mfd.); Dubilier By-Pass Condenser (1 mfd.); Premier Universal Radio Jack Filament Control; Premier No. 250 Variable Grid Leak, without mounting; Thoradson Vernier Rheostat; Ritter Loop Aerial; Martin Copeland Variable Grid Leak; Amisco Multiple Point Inductance Switch; Amisco 20-Ohm Rheostat; Amisco 50-Ohm Rheostat; Freshman Antenna; Freshman Micon Condenser, 01 mfd.; Teleradio Variable Condensers (3-plate or 11-plate); Teleradio "Read EM" Binding Posts (8); 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; Radion Panel 3/4" x 1 1/2", black or mahogany; Radion Panel 3/4" x 1 1/2", black.

Class D Articles

For eight consecutively 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 Chindler Radio Frequency Transformer; 1 Martin-15-Point Inductance Switch; 1 Martin-Copeland 19-Point Inductance Switch; Walnut Variable Condenser (5-Plate Copeland 13-Point Inductance Switch; 1 Martin-Copeland .0001 mfd.); Electrad Variadon, with mica condenser; Dubilier By-Pass Condenser (2 mfd.); CRL Variable Grid Leak with Condenser; Resistometer (Type A or 2A); Thoradson Variable Condenser, .00025 mfd.; Amisco 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; FH-Ko-Stat, R. S. C. Variable Condenser, 8-plate; Radion Panel 3/4" x 1 1/2", mahogany; Radion Panel 3/16" x 7/8" x 1 1/2", black; Radion Panel 3/16" x 7/8" x 1 1/2", black; Radion Panel 3/16" x 10" x 1 1/2", 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.); Turney Genuine Reimartz Coil; Dubilier Variadon (.0004 or .0008 mfd.); Resistometer (Type B); Delta Midget Tube and Socket; Thoradson 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 3/4" x 1 1/2", mahogany; Radion Panel 3/4" x 1 1/2", black; 1 Federal Potentiometer, 1850 ohms.

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.); Dubilier By-Pass Condenser (3 mfd.); Premier Variable Condenser without dial (.00039 mfd.); Thoradson Variable Condenser, .001 mfd.; Amisco Compensating Grid Condenser; Freshman Micon Condenser, .625 mfd.; Teleradio Variable Condenser, 43-plate; Se-Ar-De 3-Plate Condenser; Radion Panel 3/4" x 1 1/2", mahogany; Radion Panel 3/4" x 1 1/2", black; Radion Panel 3/4" x 1 1/2", mahogany; Radion Panel 3/4" x 1 1/2", black; Radion Panel 3/4" x 1 1/2", 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.); Du-

biller Variadon (.001 mfd.); Dubilier By-Pass Condenser (4 mfd.); Premier Variable Condenser with dial (.00078 mfd.); Premier Hegehog A. F. Transformer, 4 to 1 Ratio; Thoradson A. F. Transformer, 3.5 to 1 Ratio; Thoradson Variable Condenser, with vernier, knob and dial (.0005 mfd.); Thoradson Variable Condenser, with dial (.00025 mfd.); Ritter Grand Crystal Set, Amisco 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; R. S. C. Variable Condenser, 23-plate; Radion Panel 3/4" x 1 1/2", mahogany; Radion Panel 3/4" x 1 1/2", black; Radion Panel 3/4" x 1 1/2", black; Radion Panel 3/4" x 1 1/2", 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. 226 W; 1 Demcal 23-Plate Variable Condenser; 1 Acme Audio Frequency Transformer; 1 Acme Radio Frequency Transformer (R-2, R-3, or R-4); Walnut Variable Condenser (23-Plate vernier); Walnut Variable 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; Thoradson A. F. Transformer, 6 to 1 Ratio; Thoradson Variable Condenser, with vernier, knob and dial (.001 mfd.); T. B. H. Radio Head Set, 2,000 ohms; Tulp 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; Radion Panel 3/4" x 1 1/2", mahogany; Radion Panel 3/4" x 1 1/2", mahogany.

Rundradioaktiebolaget to Put It on Air in Sweden

STOCKHOLM.—"Svenska Rundradioaktiebolaget" is the name of a new firm organized in Sweden for the purpose of broadcasting. The organizers of the company are Elektriska Aktiebolaget A. E. G., Allmänna Telefonaktiebolaget, L. M. Ericsson and others. The minimum capital of the company has been fixed at \$25,000 and the maximum at \$80,000. The company has applied to the Government for a concession to broadcast information by Radio.

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Looking Ahead

Real Theories on Operation of King Milopex—as submitted by well-known engineer friends of his—will be given Radiophans next week by the Mystery Man.

It's a Bearcat! What? The two-tube reflex to appear next week as a simplex diagram. It combines selectivity with efficiency, so don't miss it.

A Visit to "The Land of Ten Thousand Lakes" by Vera Brady Shipman next week. Ever heard WLAG? Then you'll want to read this story.

Milopex Construction Series Article Number Two—by H. J. Marx. Get it next number and start building this celebrated double panel set.

More Inductance Data—Part III of this topic will be given fans next issue by Marvin W. Thompson. Good stuff to read and file for reference!

A Simple Coil Helped So Much to increase the range of one reader's set that we tried it out ourselves. Read what Mr. Rockett of Ft. Worth, Texas, says next week.

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

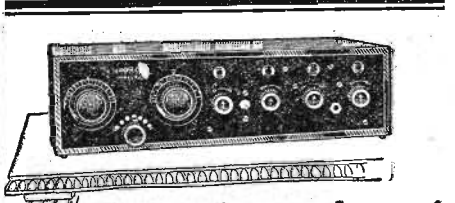
Subscriber Radio Digest, 123 West Madison St., Chicago, Illinois.

Please find enclosed check M. O. for Five Dollars (\$5), Foreign or One Year's Subscription to Radio Digest, Illustrated.

Name.....

Address.....

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



Crosley Model X-J \$65

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

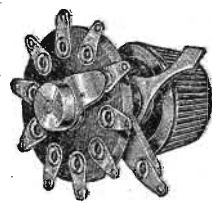
For bringing in distant stations clearly and distinctly, no set can excel a Crosley Model X-J. It is a 4 tube radio frequency set, combining one stage of tuned radio frequency amplification, detector and two stages of audio frequency amplification.

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

Write for It Today.

Crosley Manufacturing Company
POWEL CROSLY, Jr., President
11491 Alfred St., Cincinnati, Ohio

WALNART INDUCTANCE SWITCH



Why drill ten holes in your panel—not only a difficult thing to do, but if you ever make a change in your hook-up, your panel is marred—when by drilling only one hole you can use a Walnut Inductance Switch.

Positive contact; attractive Bakelite knob and pointer make a much more attractive panel, and simpler adjustment. And the price is no more than switch points with pointer lever would cost.

Ask your dealer for Walnut Inductance Switch; if he cannot supply, write us. Catalog of Walnut radio accessories and parts on request.

WALNART ELECTRIC MFG. CO.
Dept. 404, 1251 W. Van Buren St., CHICAGO, ILL.

SEES "AIR EARS" AS COMMON AS AUTOS

THINKS FANS WILL IGNORE SCIENCE OF SETS

Edward H. Jewett Predicts Public's Interest Will Soon Center upon Entertainment Only

By F. J. Huntley

DETROIT.—Edward H. Jewett, a new man in the Radio field, but old in the automobile industry, declares that the time will come soon when Radio will be as commonly accepted by the public at large as is the automobile today, and when tubes, hook-ups and wave lengths will be of less interest than the results obtainable from the different receiving sets.

"In my opinion," Mr. Jewett says, "the Radio business is undergoing a series of experiences very much like the automobile industry in its adolescent period. Radio will develop along the same lines.

"I suppose everyone can remember when a man hardly dared own a motor car unless he felt himself thoroughly equipped to attend to it in every respect. Today, I venture to say, not one automobile owner in a hundred knows anything about the inside of his car. He does not have to and he does not want to. All he does want to know is that the car will take him where he wants to go.

Will Be Interested in Quality Only
"I think the time will very soon come when Radio will reach a similar point. The great interest of people in Radio will be in what they can hear. They will be more interested in the quality of entertainment their receiving stations can furnish than in the receiving set itself.

"I look forward to the time, and I do not think it is far away, when people will buy receiving sets without having the slightest technical or scientific interest in Radio. They will simply want the set for the entertainment and instruction they can get by its use.

"Up to now, I venture to say, a big proportion of the people who have installed sets in their homes have had a really scientific interest in it.

"Of this group of the buying public, I think we have pretty nearly reached the saturation point. From now on the great increase in Radio users will be the people who are interested altogether in what they can get from the broadcasting stations and not so much in how and why it works.

"Of course," said Mr. Jewett in conclusion, "there is one element of fascination in Radio that will never be eliminated. I am confident that most people always will be more interested in getting results from a great distance than they will in getting them close from home, though the

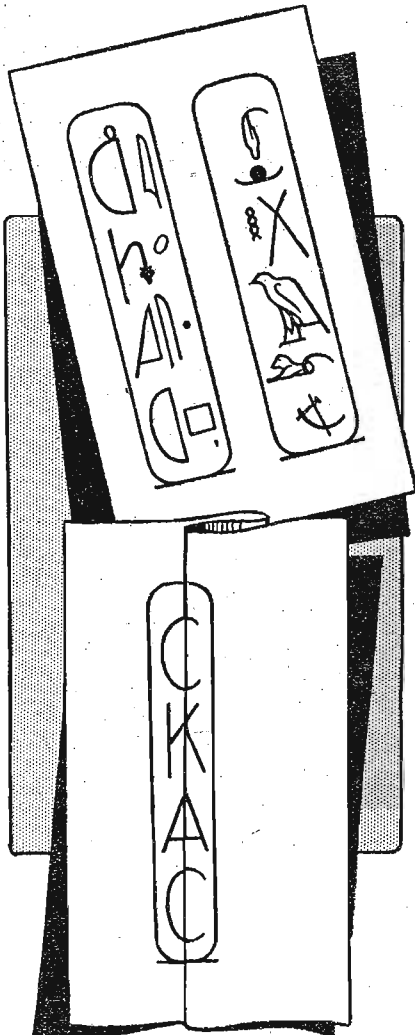
Faculty Talks Featured by Wisconsin "U" Plant

MADISON, WIS.—WHA, the University of Wisconsin station, reopened recently with the first broadcasting program of the new school year. Prof. E. M. Terry, of the physics department is in charge of the work of the station. The daily evening programs have been resumed, and short talks by Wisconsin faculty members will be featured.

Broadcasts Lynch-Burman Fight

NEW YORK.—Station WJZ reopened the Radio fight season recently with a blow-by-blow description of the Lynch-Burman melee direct from Madison Square Garden. The fight was a championship contest for the bantamweight title.

TUT'S HIEROGLYPHICS DIVULGE CKAC CALL



Station CKAC, La Presse, Montreal, Quebec, sends a printed slip, reproduced at the top, which when folded twice lengthwise, yields the call letters, CKAC, as shown below. The well-known Canadian plant would "spool" us into believing the hieroglyphics were found on King Tut's tomb, but we were "born in St. Louis" and have to be shown

Nephew in Fatal Accident; Try to Stop Auto Tourist

BOSTON.—Thousands of Radiophans, scattered throughout the great cities and isolated hamlets of seven states were listening in one Saturday night recently to WNAC when the program was suddenly halted for a moment and the announcer cut in with the request:

"If anyone can get in touch with Charles S. Hale, driving an automobile bearing the Massachusetts number 153,380, please tell him to get in immediate communication with his relatives in Cambridge. Mr. Hale is on his way to Montreal and is believed to be somewhere in New York state."

Behind that Radio message lies a story of grief in a Cambridge home. Mr. Hale's six-year-old nephew, Dicky, son of Mr. and Mrs. Howard P. Kaiser, was killed that same day in an automobile accident, and Mr. Hale was unaware of his nephew's death. The boy's father asked WNAC to broadcast the message in the hope that Mr. Hale might be intercepted.

Like anything else, a Radio set is no better than its weakest part.

Rifle Range Airphones to Replace Telephones

Ether Communication with Markers Saves Army Money

WASHINGTON.—Radio, or its half-brother, wired Radio, will be used very soon on big national rifle ranges between the firing lines and the target pits as a substitute for line telephone systems.

Results of recent Signal Corps tests during the National Rifle Matches at Camp Perry, Ohio, have demonstrated that a wired Radio system will cost only a third the money required to install and operate a regular telephone system.

On this range with 100 targets, 1,100 men fire in three hours' time and about seventy-five men, one for each ten targets, were required by the Signal Corps to maintain telephone communication between the firing points and the butts where the targets and the markers are located. The initial cost of the complicated equipment is approximately \$35,000 and the annual upkeep, including personnel, amounts to about \$11,000. Usually the whole range from 200 to 1,000 yards, is being fired at the same time. This entails considerable bell ringing, answering and conversation over regulation phone circuits.

The new system planned and laid out by Captain H. W. Webb, of the Signal Corps, eliminates considerable time, work and complication. With a field Radio transmitter, five loud speakers and a little wire, he conducted a most satisfactory test during the last days of the recent matches. When a target was not pulled down, he spoke into the transmitter on the firing-line, saying, for example, "Mark 21," or "Mark 67," which would be at least 200 feet from No. 21. All along the line of pits the five loud speakers announced his order, and No. 21 or No. 67 came down and was marked promptly. Those in the pits not concerned with the numbers called paid no attention.

Germany Loosening Radio Laws

WASHINGTON, D. C.—Recognizing that Radiophony has now become an important economic institution, valuable as an agent of communication between Germany and foreign countries and within Germany itself, the German ministry of posts and telegraphs, which has hitherto exercised a restrictive monopolistic control over all Radio operations, is contemplating an early relaxation of existing restrictions for the benefit of the general public.

JOSH'S KITTY CALLS FOOLS REAL KITTIES

One Puss Rouses from Sleep to Investigate; Another Hides Away

SCHENECTADY, N. Y.—There are cat-calls and then there are kitties when the full house is raised by a jackpot and called, but WGY, the station of the General Electric Company unearthed a new one when it broadcast the enticing "Kitty, kitty, kitty," as Josh Quinby, one of the characters of a sketch, put out the cat for the night at its recent Farmers' Night program.

Came word from a Radiophan in Addison, N. Y., "To convince you how perfectly we received your program, I will tell you that our pet kitty was lying on the sofa asleep. When the groom of fifty years ago was calling kitty to put her out, our kitty immediately got up to see who was calling him and for two or three minutes did not remove his gaze from the loud speaker."

Score Two: Charles J. Chase who runs the general store at Sebec Station, Maine, wrote, "Our cat heard you call and knew it was bedtime and hid away and did not want to be put out."

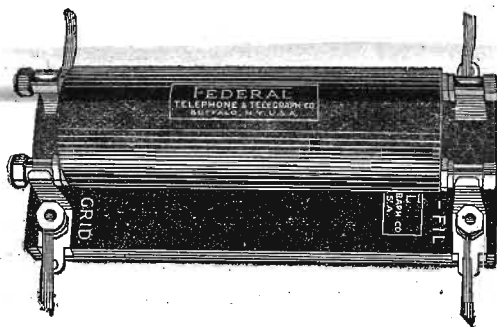
Army to Open Its Largest Station at Ft. Douglass

FORT DOUGLASS, UTAH.—The first of November will witness the inauguration of the big new army signal corps station here as the largest Radiotelegraph station of the army. The transmitter will have but one tube but that is to be of the water-cooled, ten-kilowatt type.

Another similar station is being erected at Ft. Leavenworth, Kan., but this station will operate with two smaller tubes and will have a Radiophone transmitter as well as the telegraph. The circuit between these two stations, the Arlington, Va., station and a land line from Ft. Leavenworth to San Francisco, will span the United States.

Thieves Cop His Air Ears

BUFFALO, N. Y.—It's tough when you have your air ears taken away from you. But that is what happened to George J. Reinie here recently when some sneak thieves entered the house and stole Mr. Reinie's complete Radio outfit. They gained entrance to the place by forcing a window. The set has not been found, nor have the thieves been located.



You Can Cover a Tremendous Range of Wave-Lengths with Federal R.F. Transformers

WITH one mounting, you can use any one of four Federal R.F. Transformers covering any wave-length from 175 to 3000. Contacts are made through spring clips, and the transformers can be changed in a few seconds.

Highest grade of materials, and painstaking care in assembly assure efficient amplification of incoming signals without distortion.

130 Federal Standard Radio parts offer the radio enthusiast a complete line of guaranteed parts of one quality—the best.



Federal Radio Equipment

Federal Telephone and Telegraph Company

Factory: Buffalo, N. Y.

- Boston
- New York
- Philadelphia
- Chicago
- San Francisco
- Pittsburgh
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The New Grebe Broadcast Receiver



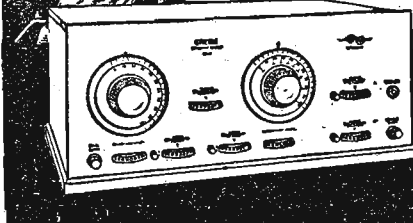
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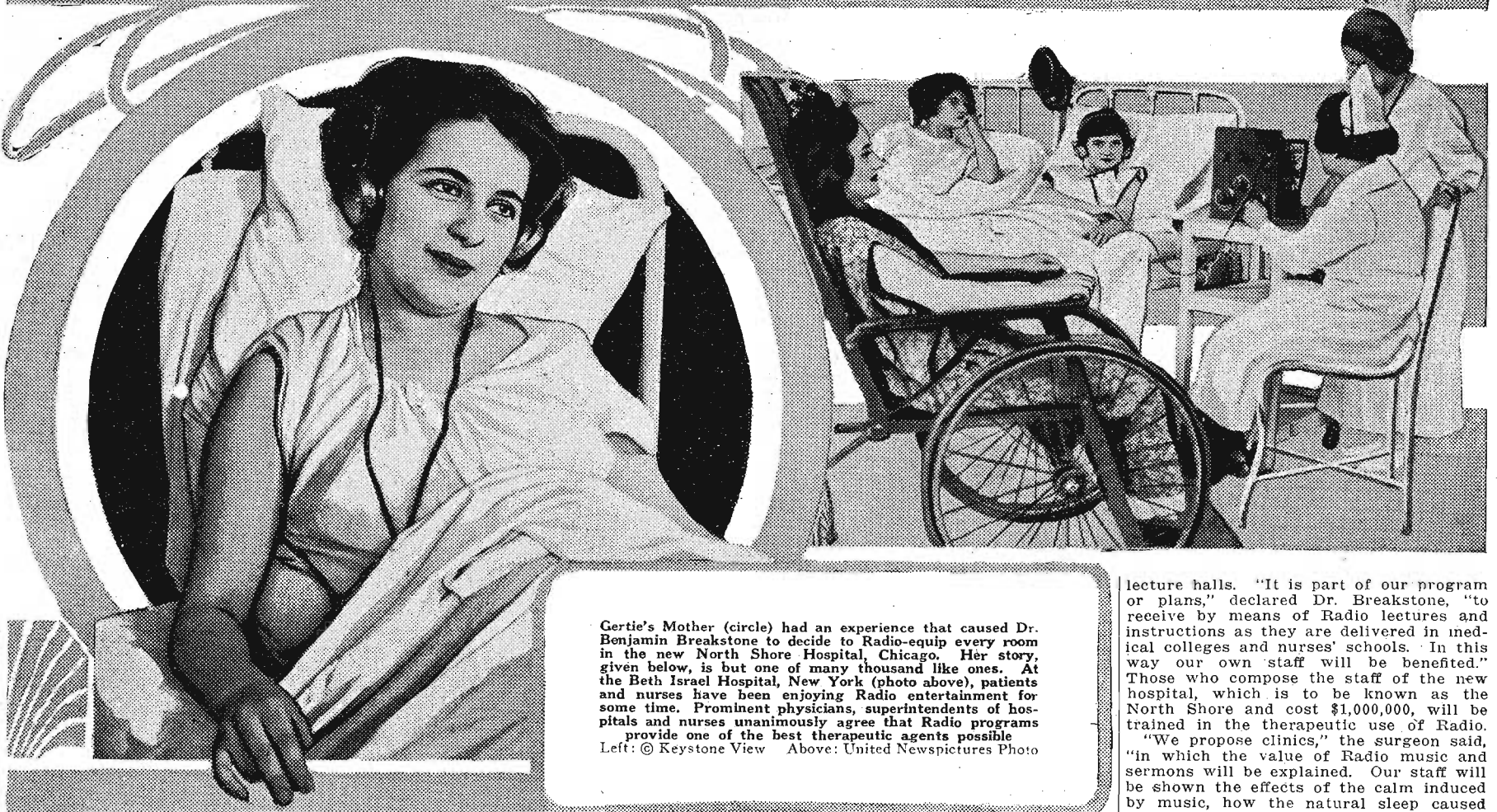
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A. H. GREBE & CO., Inc. Richmond Hill, N. Y.



NEW HOSPITAL REPLETE WITH RADIO



Gertie's Mother (circle) had an experience that caused Dr. Benjamin Breakstone to decide to Radio-equip every room in the new North Shore Hospital, Chicago. Her story, given below, is but one of many thousand like ones. At the Beth Israel Hospital, New York (photo above), patients and nurses have been enjoying Radio entertainment for some time. Prominent physicians, superintendents of hospitals and nurses unanimously agree that Radio programs provide one of the best therapeutic agents possible. Left: © Keystone View Above: United Newspictures Photo

Case of Gertie's Mother Leads Hospital To Plan for Radio as Healing Agent

Dr. Benjamin Breakstone of Chicago, Determines to Build Institution Fully Equipped with Radio Sets—Tells Value of Music as Soother of Suffering Patients

By J. L. Newman

CHICAGO.—Even the internes, nurses and most of the staff of the hospital were touched by the yearning, hungry mother love in the eyes of the aged woman in the surgical ward. Of course, they had often seen that look in the eyes of others, had often been pestered by querulous queries. But even the hospital attaches, of necessity hardened to pain, were softened by the woman's moaning appeals for "Gertie."

Now Gertie was a singer, a professional entertainer. She had to warble about bananas and such while her mother lay in the great shadow. Gertie had promised Mother to sing before the latter was taken to the table near which lay shiny little knives and hovering around which was the odor that sickened.

As the time for the operation came apace Mother grew more insistent in her pleas to hear her daughter's voice. But Gertie was downtown and Mother lay far away. The patient tossed and groaned. Her eyes grew wide; her skin paled; she became fevered. Her condition, caused concern. The surgeons could not operate while the woman was enfeebled. "I want to hear Gertie once more"—but Gertie—

Enter: The Radio Set

Mother's life was at stake. The head surgeon and his assistants idled at her side. There came into the ward the husband of another woman, a wife who had suffered. Under his arm was a polished box from which dangled several cords. The man placed the box on a nearby table. His wife's cheeks flushed beneath their pallor. A few twirls of the knobs on the box, several mysterious motions, and there came, as if by magic, into the ward the warm overtones of a soprano.

"Gertie, my Gertie—thank God"—and Mother, in ecstasy, almost leaped from her bed. "That's my daughter," she cried, then sank back on her pillows and closed her eyes. Borne on the air came "Nearer, My God, to Thee," sung by Gertie.

What Made Decision

Mother sighed, then drifted into slumber, calm, deep. The surgeon ordered the operation to proceed. Mother endured the ordeal so well that instead of lying ill and weak for many days she was able, in the next forty-eight hours, to listen to Gertie again.

"And that's what led me to determine," said Dr. Benjamin H. Breakstone, chief of the West End hospital in Chicago, "to

build a hospital in which all the rooms would be equipped with Radio."

In the next nine months there will be in operation in this city what will be perhaps the first hospital in the world completely equipped with Radio for therapeutic purposes. "For there is no doubt," continued Dr. Breakstone, "that music is a healing agent. It soothes the mind, brings rest and peace. The ancients knew it. David played his harp and Saul, the King, became at ease. The Greeks and Romans knew the value of music in relation especially to mental disturbances and in recent years the efficacy of melody when applied to the treatment of various diseases has often been demonstrated."

Radio Soothes; Quells Fears

The nervous strain, the fears that usually accompany and complicate surgical cases, are frequently allayed by music.

"My attention to the effects of music on patients was concentrated a few months ago," said Dr. Breakstone, "in the efforts of the Salvation Army and of the Boy Scouts. When they sang and played musical instruments in hospitals the patients became courageous and the convalescents patient." The work of the surgeons became less risky and arduous. Music was considered a kind of sedative. "Sacred songs seemed to exert a beneficial effect, especially on those patients who were religiously inclined," asserted the surgeon.

So impressed was Dr. Breakstone by the possibilities of Radio in connection with the conduct of hospitals that he urged its wide adoption to a convention of hospital superintendents in session here recently. His opinions were endorsed by the delegates. "It will not be long," said Dr. Breakstone, "before every modern hospital in this country will be equipped with Radio."

Radio Plug Outlets in Each Room

In the walls of each of the 200 private rooms which will compose Dr. Breakstone's new hospital will be plug outlets for the reception of music, sermons, lectures and the like by means of head phones. Leading from these rooms will be wires whose terminus will be a large receiving set which will be operated in a room on the sixth or top floor. "All the wiring will be concealed," said the surgeon.

The receiving set will be operated day and night in accordance with the programs of broadcasting stations all over the country. Convalescents may thus

listen in to the news of the day, to the stock markets, to church services, to concerts and to speeches. Dosages of Radio will be as much a part of the treatment as will drugs.

Will Educate Nurses and Staff

Loud speakers will be placed in the reception room of the hospital and in the

lecture halls. "It is part of our program or plans," declared Dr. Breakstone, "to receive by means of Radio lectures and instructions as they are delivered in medical colleges and nurses' schools. In this way our own staff will be benefited." Those who compose the staff of the new hospital, which is to be known as the North Shore and cost \$1,000,000, will be trained in the therapeutic use of Radio. "We propose clinics," the surgeon said, "in which the value of Radio music and sermons will be explained. Our staff will be shown the effects of the calm induced by soothing strains is worth far more than narcotics. They will see the power of mind over body when the mind is calmed by Radio."

To Read Ads to Women Patients

Realizing that women, no matter how ill, are usually interested in bargains, Dr. Breakstone intends to include in the Ra-

(Continued on page 6)

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

Station and City	Mch.	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
CFCN, Calgary, Alta.	440	12:00-1:00		11:00-2:00			11:00-1:00	
CKAC, Montreal, Que.	430		6:00-8:30		6:00-8:30		6:00-8:30	3:30-4:30
KDKA, E. Pittsburgh, Pa.	326	5:00-9:00	4:00-8:00	5:00-9:00	5:00-9:00	5:00-9:00	5:00-9:00	9:30-7:30
KDZE, Seattle, Wash.	455	10:30-12:30		10:30-12:30				
KFAY, Denver, Colo.	360	9:00-10:00	9:00-10:00		8:30-9:00	9:00-10:00	9:00-10:00	
KFI, Los Angeles, Calif.	469	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
KGW, Portland, Ore.	492	10:00-12:30	10:00-1:00	10:00-1:00	10:00-1:00	10:00-1:30	10:00-1:00	10:00-10:00
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	8:00-12:00
KPO, San Francisco, Calif.	423	10:00-12:00	10:00-12:00		10:00-12:00		10:00-12:00	10:00-12:00
KSD, St. Louis, Mo.	546	8:00-10:00	8:00-1:00	8:00-1:00		8:00-10:00	8:00-10:00	
KYW, Chicago, Ill.	636		8:00-9:00	8:00-9:00	8:00-9:00	8:00-9:00	8:00-9:00	
NAA, Radio, Va.	435	5:45-7:20	6:05-7:20	6:25-7:40	5:45-7:40	7:05-7:40		
PWA, Havana, Cuba	400			8:00-10:30			8:00-10:30	
WBAP, Fort Worth, Texas	476	7:30-10:30	7:30-10:30	7:30-10:30	7:30-10:30	7:30-10:30	7:00-7:30	5:00-6:00
WBZ, Columbus, O.	390	7:00-9:00						
WCAF, Springfield, Mass.	337	6:30-8:00	6:30-8:00	6:00-8:00	6:30-8:00	6:30-8:00	6:30-8:30	7:30-8:30
WCFB, Washington, D. C.	469		5:30-6:30		8:45-11:00		5:30-11:00	5:20-8:00
WCBD, Zion, Ill.	345	8:00-10:00				8:00-10:00		2:30-5:30
WCA, Detroit, Mich.	517	7:30-9:00	7:30-11:00	7:30-9:00	7:30-9:00	7:30-9:00		6:15-7:15
WDAF, Kansas City, Mo.	411	8:00-1:00	11:45-1:00	8:00-1:00	11:45-1:00	8:00-1:00	11:45-1:00	4:00-5:00
WDAF, 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
WDAQ, Chicago, Ill.	360		7:00-1:00	7:00-1:00	7:00-1:00	7:00-1:00	7:00-1:00	9:15-11:15
WDAK, Philadelphia, Pa.	395	6:30-9:55	6:30-7:00	6:30-10:00	6:30-7:00	6:30-12:00	6:30-7:00	
WDAK, New York, N. Y.	405			6:00-7:00		10:00-11:00		
WDAK, New York, N. Y.	492	6:30-9:00	6:30-9:00	6:30-9:00	6:30-9:00	6:30-9:00	6:30-10:00	6:30-9:00
WFAA, Dallas, Tex.	476	8:30-9:30	8:30-12:00		8:30-9:30	8:30-9:30	8:30-12:00	9:30-11:00
WFI, Philadelphia, Pa.	395	6:00-6:30	6:00-8:00	6:00-6:30	6:00-8:00	6:00-6:30	6:00-6:30	6:30-7:30
WGL, Medford, Mass.	360		6:00-7:30	6:30-8:00	6:00-7:30	6:30-8:00	6:30-8:00	7:30-10:00
WGR, Buffalo, N. Y.	519	5:30-9:00	5:30-7:45	5:30-9:00	5:30-7:45	5:30-9:00	5:30-7:45	
WHA, Schenectady, N. Y.	380	6:45-9:00	6:45-9:00		6:45-9:00	6:45-10:30		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	4:00-5:00
WHAS, 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	5:00-8:55	5:00-5:30	5:00-5:30	5:00-5:30	7:00-8:55
WHN, New York, N. Y.	360	6:30-11:00	8:30-11:00	6:30-11:00	8:30-11:00	8:30-11:00	6:30-11:00	8:30-11:00
WIP, Philadelphia, Pa.	609	5:00-6:30	5:00-11:00	5:00-6:30	5:00-10:00	5:00-6:30	5:00-11:00	3:30-4:30
WJAX, Cleveland, O.	390		6:30-8:30		7:00-9:30			
WJAZ, Chicago, Ill.	448		10:00-2:00	10:00-2:00	10:00-2:00	10:00-2:00	10:00-2:00	6:00-9:00
WJZ, New York, N. Y.	455	6:30-10:30	6:30-10:30	6:00-10:30	6:30-10:30	6:30-10:30	6:30-10:30	7:00-9:30
WKAQ, San Juan, P. R.	360		7:00-8:30				7:00-8:30	
WLAG, Minneapolis, Minn.	417	7:30-10:00	7:30-10:00	7:30-12:30	7:30-10:00	7:30-10:00	7:30-12:30	7:45-8:45
WLW, Cincinnati, O.	309	8:00-10:00	10:00-12:00	8:00-10:00	10:00-12:00			
WMAQ, Chicago, Ill.	448		7:00-10:00	7:00-10:00	7:00-10:00	7:00-10:00	7:00-10:00	4:30-5:00
WMC, Memphis, Tenn.	500	8:30-9:30	8:30-12:00		8:30-9:30	8:30-12:00	8:30-9:30	
WNAK, Boston, Mass.	278		7:00-9:00	8:00-10:00	7:00-9:00	7:00-9:00	8:00-10:00	5:30-7:30
WNAK, San Antonio, Texas	385		9:00-10:30		7:30-8:30		9:30-10:30	9:30-10:30
WOAW, Omaha, Neb.	526	9:00-10:00	9:00-10:00		9:00-10:00	9:00-10:00	9:00-10:00	9:00-10:00
WOC, Davenport, Ia.	484	8:00-9:00		8:00-11:00	8:00-9:00	8:00-9:00	9:00-10:00	7:00-10:00
WOO, Philadelphia, Pa.	609	6:45-10:00				6:45-10:00		
WOR, Newark, N. J.	405	5:15-10:00	5:15-6:30	5:15-10:00	5:15-6:30	5:15-6:30	5:15-10:00	
WOS, Jefferson City, Mo.	441	8:00-9:30		8:00-9:30		8:00-9:30		
WRC, Washington, D.C.	469	7:00-9:00		7:00-9:00		7:00-9:00		
WSAI, Cincinnati, O.	309		8:00-10:00		8:00-10:00		10:00-12:00	
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		8:00-9:00
WTAM, Cleveland, Ohio	390			7:00-8:30			8:00-10:00	
WTK, Detroit, Mich.	517	7:30-9:00	7:30-9:00	7:30-9:00	7:30-11:00	7:30-9:00		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. This table includes only the evening broadcasts, and on Sunday, the late afternoon program.

REVEAL RADARIO CONTEST WINNERS

"WHAT'S THE USE" GOES ON AIR NOVEMBER 21

Score of Worthy Manuscripts Selected by Judge—Minneapolis Writer Gets Second Prize

(By Fred Smith, Studio Director of WLW)

CINCINNATI.—The Writer's Digest has just concluded the first contest in the history of human literature for the newest form of writing, the Radio play of Radario, and the most important fact resulting from the contest was that a new market for the literary efforts of creative minds has been established.

The second most important fact, to be deduced from an examination of the manuscripts, was that at least a score were worthy of presentation by Radio. But back to the winning of the contest:

One afternoon when I was wading through the big pile of typewritten material, I found myself suddenly laughing as though I were reading Moliere or Benavente. I knew that I had found the winner. The situation, atmosphere and handling were perfect. The title page was this:

"OH, WHAT'S THE USE?", a Radario comedy in one act, by Lillian Taft Maize, 1069 Senate street, Portland, Oregon.

Setting of Winning Radario

And then followed:

SCENE: The home of one of the members of the Women's Civic Improvement Club, in a large city between Boston and San Francisco.

TIME: The present.

CHARACTERS: Mrs. Bigsbee, president of the club; Mrs. Somerville, Mrs. Lowell, and Mrs. Green, prominent members whose voices are often heard; Lieutenant Donoghue, a representative of the police department. Other members, unimportant, but those whose voices swell the chorus from time to time.

The Radario begins with a confused murmur of voices, for the meeting has not yet begun, and the members are chatting. They are interrupted by the sharp tapping of the president's gavel. After strenuous effort the president quiets the ladies, although Mrs. Somerville and Mrs. Green are reluctant to cease gossiping. When silence prevails Mrs. Bigsbee makes a flowery speech and concludes by introducing "Lieutenant Timothy Donoghue, who will speak to us on the subject: 'Our Traffic Rules and Their Regulations.'"

Will Go on Air November 21

Well, well—the scene that follows—the Irish lieutenant being incessantly interrupted by the members of the Women's Civic Improvement Club—is handed with a gentle satire that would crack a smile in the dullest face on this old earth.

"Oh, What's the Use?" has already been turned over to Helen Schuster Martin, who is directing the Crosley Radarios this winter, and will be presented from WLW on the evening of November 21. The beautifully melodious voice of Slack Barrett will be cast as Lieutenant Donoghue, and Mrs. Martin is sure to select the other voices with greatest care. When it came to the second prize winner, our choice fell upon a beautiful and uplifting story of Christmas Eve. It is a Radario entitled "The Drum," written by Frances D. Singler, 624 New York Life Building, Minneapolis, Minnesota. There are only four people in the cast: Nell Harvey, an apartment house dweller; John Harvey, her husband; Ted Martin, her young brother; The Tramp.

But there is a soul to this little twenty-minute Radio play, and we hope to get the spirit of the thing over to the audience

TO AWARD MONTHLY PRIZE FOR RADARIOS



Powell Crosley, Jr., owner of Station WLW, Cincinnati, who has offered regular monthly cash awards for the best Radarios (Radio plays)

on our WLW program on Christmas Eve.

The third prize went to Emabel Wesley, Route 4, Box 95, Bakersfield, California, the title of the Radario being "Tell a Woman." We have not yet decided upon the date of its presentation. But even apart from these three there are a score of manuscripts cleverly prepared, and worthy of Radio presentation. Thus a new problem presents itself. Shall we continue to stimulate the writing of Radarios? Powell Crosley, Jr., president of the Crosley Manufacturing Company, owner of Station WLW, answers in the affirmative.

Mr. Crosley knows full well that many an aspiring young author would be only too willing to submit his manuscripts gratis in return for the great publicity that he would derive from their presentation by Radio. However, Mr. Crosley is not thinking of the broadcasting of this winter or next, but Radio of the future, and in that future there must be a definite aim toward constructive programming. So for the present, WLW is offering a nominal monthly prize of twenty-five dollars for the best Radario submitted.

Rules for Monthly Contest

The rules governing this latest offer are:

1. The plot and locale should be distinctively American.
2. Playing time not longer than twenty minutes.
3. Brief synopsis must accompany Radario.
4. Must be typed double space on one side of paper.
5. Return address on all manuscripts.
6. Short biography of author may be included.
7. Return postage must be sent with manuscript.
8. Address Radario Department, Crosley Manufacturing Co., Cincinnati, Ohio.

9. All rights of winning Radario belong to Crosley Co.

10. Crosley Company will not be responsible for manuscripts but every effort will be made to return immediately after selection of winning Radario.

11. Judges: Helen Schuster Martin, of the Schuster Martin Dramatic School, T. C. O'Donnell, Editor of The Writer's Digest, and Fred Smith, studio director of Station WLW.

12. Monthly contest closes on the first of every month.

HOSPITAL WITH RADIO

(Continued from page 5)

dio programs for the new hospital the reading of advertisements in daily newspapers. "Half of 'the battle' in surgical cases," he said, "is to try to induce the patient to forget him or herself. Radio is undoubtedly the best and most natural way to do it."

So that the 10,000 or more patients usually lying in hospitals in Chicago may be treated by Radio, Dr. Breakstone proposes to establish in the North Shore hospital a broadcasting station to transmit musical and other forms of entertainment. "We shall have an orchestra in the

new hospital whose music will be broadcast to like institutions here."

Public Lectures from Hospital Station
It is planned also to use the hospital station to broadcast to the public instructions or advice dealing with the public health.

That the use of Radio as a healing agent is likely to become general is evinced by the fact that ten other hospitals in Chicago have begun the installation of receiving sets along the lines suggested by Dr. Breakstone.

And when there shall be another Mother pining for her Gertie, Radio will serve as a solace, a harbinger of hope, a messenger whose ministrations will be borne on the bosom of the eternal ether.

Departing Guest Arrested as Radio Lists Swindles

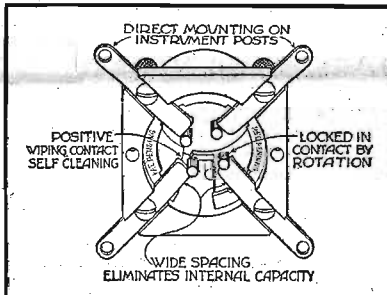
MONTREAL.—Just before F. Lester Stowe of Cleveland, Ohio, checked out of a Montreal hotel the description and numbers of \$1,500 worth of checks that had been stolen in Cleveland were received at the hotel by Radio. Stowe presented one of the checks and was held to await extradition.

No Outdoor Wires—
The 20-foot silk-covered wire is the only antenna required with
The New GREBE Broadcast Receiver

This wire may be concealed behind the picture moulding. There is no unsightly wiring of any kind, as compartments are provided for all necessary batteries.
Write for "Grebe Radio in the Well-Appointed Home."

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



E.J. Flewelling Sockets

Out of a desire to create and build only parts possessing the utmost in efficiency has come this truly perfect socket. Simplicity is the keynote and secret of its successful performance.

BUELL MANUFACTURING COMPANY
2977 COTTAGE GROVE AVE.
CHICAGO

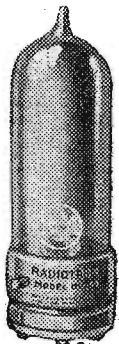
RADIO TALKS

Connecting wires are a nuisance in a Radio set. A set that would most completely satisfy the requirements of extremely short and direct leads would be the ideal, and it would contain a minimum amount of connecting wire in its construction. We really should work toward the idea of "Wireless Radio Sets" because of the many inherent and obvious advantages they would have over present day construction.

E.J. Flewelling

\$1.00

Flewelling Tube Socket \$1.00. At your dealer's, or, until he is supplied, post paid upon receipt of price.



UV-199

Radiotron UV-199 is a small tube—but 3 1/2 inches high. But it is a tube of big performance—an excellent detector, audio and radio frequency amplifier.

It means economy—lives longer than other tubes—and draws but .06 ampere, filament current. Nothing like it for portable sets, because it can be used with little flashlight batteries.

Price **\$6.50**

Radio Corporation of America

Sales Offices: Dept., 3002
233 Broadway, New York

10 So. La Salle Street, Chicago, Ill. 433 California Street, San Francisco, Cal.

Be sure the vacuum tubes you buy are marked Radiotron.



This symbol of quality is your protection

Radiotrons

REG. U. S. PAT. OFF.

WASHINGTON FALLS IN LOVE WITH WRC



"The Voice of the Capital," or WRC, the powerful Radio Corporation plant in Washington, was formally opened by the group at the left: Theodore Roosevelt, Jr., David Sarnoff (center) and Major General Frank L. Hines (right). Below is the operator and the control equipment and at the right are two of the artists in the specially designed studio. Note the artistically arranged microphone © U. & U.

Carries Words of Nation's Leaders

New Class B Station Forms Instantaneous Link Between Capital and "Home Folks"

By L. M. Lamm

Washington's newest Class B Radio broadcasting station, WRC, began a regular service not long ago, and the capital is in love with it.

Located in the Mount Pleasant district, one of the highest points in the city, where the antenna wires are suspended high above the street level, the waves radiate from the station in an unobstructed path in all directions. With the antenna system energized by powerful 500-watt transmitter set, reception of the station in Delaware, Maryland, Virginia, West Virginia, eastern Pennsylvania and southern New Jersey is particularly good, while in the District of Columbia strong signals can be received at all times during the day and evening when the station is on the "air." Radio interest in the District and adjoining states has been markedly stimulated by the opening of this station, together with Station WCAP, as reception in this section has been unsatisfactory.

Will Carry Words of Nation's Leaders

Not only does Washington and its vicinity now have adequate radio service, but to every corner of the United States, this powerful station may carry the words of great men in political and diplomatic life, the progress of world events as they transpire and the music of other nations as rendered by visiting musicians. The station provides an instantaneous link between the country's political center and every American home and a better understanding of government, of issues involved in political campaigns and of the questions which arise in our relations with foreign

countries, cannot fail to result from its operation.

There is a wealth of material available in Washington from which to make the programs of WRC most enjoyable and educational. At once it is possible that the ceremonies accompanying the dedications of memorials to great Americans, the features of the many conventions held in this city, and the spiritual counsel of the clergy may be carried to the transmitter and set forth so that the whole country may hear and appreciate them.

Washington Rich in Talent

Momentous events of interest to the nation, do not, of course, occur every day. The greater part of this station's operating hours are devoted to the broadcasting of the musical and dramatic talent of Washington and other events of special interest to residents of this city. Washington is rich in both professional and amateur talent and every effort is made by those in charge of Station WRC to arrange programs so that those local interpreters of music and drama may be heard from time to time not only by their fellow townsmen, but by citizens of neighboring cities.

The studio, as well as the transmitting apparatus and office are located in one section of the Riggs National Bank building. The studio is of acoustically correct construction and prevents even the minutest echo which might otherwise blur the clearness of transmission necessary to enjoyable entertainment.

Two Transmitters Provided

Close to the operator, and occupying the greater part of the room, are the powerful

transmitters. Although but one will be in use at any time, two complete sets are provided, that a reserve unit may be in instant readiness should the active set fail for any reason. It is planned to operate these outfits alternately on alternate days. Either set is equal, in power, range and clearness, to any now in use, being rated at 500 watts effective output, but if the two sets are combined for the broadcasting of some special event, the range

of this station will equal or may even surpass that of any other in the country.

Each is complete in itself and contains all necessary tubes, inductances, condensers and transformers, this equipment being mounted behind a large panel and completely shielded by a perforated steel cabinet. This not only eliminates any chance of interaction between the Radio and audio frequency currents but protects the operators from accidentally contacting with bare surfaces carrying 2,000 volts.

Assure Perfect Transmission

The operating table is in front of the transmitters and on it is a small box through which the operators may throw in either of the powerful transmitters and listen to the outgoing program at various stages of its progress. On this table also, is a microphone that the operator on duty may cut in and talk to the invisible audience himself should this be

(Continued on page 8)

IT DIDN'T take the boys of the nation long to wake up to the fact that they could get De Forest Audions for their Radio Receiving Sets. They knew De Forest was the inventor of the vacuum tube—they knew that every tube made, no matter what set it works in, was based on De Forest patents. So they are all insisting on De Forest Audions, and they are getting the DX and clear reception results they deserve. Three types available—DV 6-A Universal at \$5.00—DV-1 for dry cell use at \$6.50—and DV-2 Power Amplifier Audion are suitable for use with receiving sets of all makes, and they work particularly well in the famous cross-continent Reflex Radiophones with indoor loop—D-7-A at \$125.00 and D-10 Portable (dry cells enclosed in cabinet) at \$150.00. To prices quoted add approximately 6% for transportation for territories west of the Rocky Mountains.

Send for circular "What Tubes Shall I Use?" which gives full details and table of various tubes for different receiving sets.

DE FOREST RADIO TEL. & TEL. CO.
Dept. R. D. 3 JERSEY CITY, N. J.

If Located West of Pennsylvania address

DE FOREST RADIO TEL. & TEL. CO.
Western Sales Division
Dept. R. D. 3, 5680 12th St. DETROIT, MICH.



PACIFIC COAST BRANCH:
329 Union League Bldg.
LOS ANGELES

The Superlative Inductance
Four years of careful attention to the details of manufacture of this type of inductance unit has yielded a product of unquestioned superiority. And with increased efficiency in manufacturing methods, moderate prices prevail for all sizes
Ask Your Dealer
Coto-Coil
"Built First to Last"

COTO-COIL CO. PROVIDENCE

LOTS OF SONG HITS FOR BROADCASTERS

MUSIC TRUST LOSES COUP IN ATTEMPTED GRAB

Plant Owners Meet, Elect Officers and Laugh at Fizzle Opponents Made of Things

(Continued from page 1)

to organize its own music publishing company, so that the hundreds of thousands of Radiophans desiring sheet music of the selections they listen in to may have a sufficient and ample supply.

Say Broadcast Is Great Advertisement

Endless evidence of the power of Radio to make music popular, to "put over" movies, to assemble the biggest fight and baseball crowds in history and to fill theaters was recited by broadcasters and theatrical men.

T. B. Grantland, manager of WHN, the new station owned by the Loew Theater Syndicate, told how the theaters controlled by the company were packed as the result of the broadcasting done by the syndicate.

Morris Gest, the impresario, in an interview recently declared a certain Broadway theater played to audiences a third greater after broadcasting than prior to entering the Radio game.

Chicagoan Made President

In the annual election of officers Chicago broadcasters figured prominently. Eugene F. McDonald, Jr., of the Zenith-Edgewater Beach hotel station, WJAZ, was elected president of the association. The other officers chosen were:

First vice-president—Frank W. Elliott, WOC, Davenport, Iowa.

Second vice-president—John Shepard, III, WNAC, Boston.

Secretary—J. Elliott Jenkin, WDAP, Chicago.

Treasurer—Powel Crosley, Jr., WLW, Cincinnati.

The directors chosen were: Harold Power, WGI, Medford Hillside, Mass.; William S. Hedges, WMAQ, Chicago; Bowden Washington, WLAG, Minneapolis; Henry J. Rumsey, WDAP, Chicago; Leon Samuels, WJAR, Providence, R. I.; W. S. Harris, WLAG, Minneapolis; G. Brown Hill, KVQ, Pittsburgh, and Robert Shepard, WEAN, Providence, R. I.

Pledge Support

During the meeting Paul B. Klugh, executive chairman of the association, received a telegram from the Westinghouse Electric & Mfg. Co., pledging the support of their stations. Mr. Klugh announced that the stations of the Radio Corporation of America were now co-operating with the National Association of Broadcasters.

The next session of congress will be called to pass laws imposing the same limitations upon broadcast material as are placed upon matter sent through the mails.

"The great possibilities of Radio as a public benefactor are just beginning to be realized," said Mr. Klugh. "But just as there are possibilities for good, there are possibilities for evil. For that reason I believe it to be necessary to guard against the possibility of Radio being mis-

FORGETS COMING ON BUT NOT CUTTING IN



Billy Van, the eccentric comedian, is a victim of "Radiomania"—an affliction that is aggravated, not cured, by vibrations. His is a bad case; he keeps the receiver in his dressing room and regularly forgets his cue while cutting in on the ether waves. © U. & U.

used. Bolshevism or other un-American principles may be poured into the ears of the Radio public unless the government keeps the air as free of this type of matter as the mails are kept."

WASHINGTON LOVES WRC

(Continued from page 7)

necessary at any time. By means of an inter-communicating phone the operator may talk to office, studio and reception room, or be called by them.

One feature of this station found only in the latest broadcasting installations, and one which further assures perfect transmission of programs, is a device known as the oscillograph, by which the operators have before them "a working picture of the voice." The delicate instrument may be switched into any one of the many circuits and shows by means of a beam of light, exactly how the artist's voice or music is affecting the electrical and Radio currents. By watching this little telltale beam, as reflected from revolving mirrors, one knows instantly whether the sound waves are too weak, too great in volume or blurred.

The late Warren G. Harding was the first President of the United States to broadcast.

SQUIER TELLS FANS WHAT MAY SOON BE

MOVIES AND ADVERTISEMENTS TO GO ON AIR

Head of Army Signal Branch in Interview Predicts Radical Changes in Broadcast Field

(Continued from page 1)

artistically for the human ear, just as motion pictures have developed Mary Pick-fords to appeal to the eye.

"The potentialities of broadcasting," Major General Squier said as he elevated his head a trifle and gazed into the distance, "are literally the most powerful agency yet developed for the advancement of civilization in its different aspects. The educational and cultural features alone which it makes possible, staggers even the most vivid imagination.

Sees Advertising on the Air

"Radio will soon be in every home as a necessity and not as a luxury. Hotels and apartment houses will have available continuously service of the highest class in every room. Important news and high class advertising, on an entirely new and different basis, will be included in programs of the future."

Here the general stopped to explain what he meant about Radio advertising. He said that this does not mean that broadcasting stations will take over the functions of newspapers, but that they will be used as a corollary to publications.

"Broadcast news and advertisements," he continued, "will arouse greater interest in the printed word, by calling attention to advertisements appearing in newspapers.

Development Unparalleled

"About two years ago we first heard the word broadcasting, and during that short time we have seen a development absolutely unparalleled in all history. At the present moment some millions of sets are distributed throughout the length and breadth of our country, and news is being broadcast to an unseen audience which is very difficult to estimate.

"How about the immediate future, general?" the writer asked.

"You ask about immediate future," continued the well-known Radio authority. "I am convinced that we are in the first stage of the development of broadcasting, where some member or members of each family enjoy or is willing to either make his own set or tinker with it until he gets results.

Making Own Sets to Decrease

"There will always be a certain percentage of the population which will love to do this, but we are just entering the second phase of broadcasting, where the object will be 'service' by the simplest, cheapest and most universal manner. As in the case of the automobile, the first users were a

few people who loved to take the engine apart and tinker with it. This phase soon passed away, until now most people know nothing about the engine, but want a service man as quickly as possible in case of trouble.

"When one thinks of a Radio receiver being in every home and apartment house, he immediately agrees that the instrument itself must be reduced to a very simple affair, probably even simpler than the telephone receiver is now. The unsightly antennas, batteries and mahogany cases must soon disappear."

So ended the interview, the general taking leave to go over to the Radio experimental laboratories of the government, where many important pieces of research are being conducted.

2,790,045 Phones in Use

BOSTON.—Statistics gathered from broadcasting stations all over the country in various surveys made by Radio interests show, according to best obtainable estimates, that there are 2,790,045 receiving sets in use at the present time, with an estimated Radio audience of 11,160,180 people. These figures have been checked up from several different sources, but yet they may be considered only as estimates, and not absolutely accurate.

Series of Concerts on WEA F

NEW YORK.—A series of weekly concerts to be given over the Radio by the Choral Society of Abraham & Straus, Brooklyn, was started recently by Station WEA F, the American Telephone and Telegraph Company.

FORMICA

A Laminated Phenolic Condensation Product
SHEETS TUBES RODS
RADIO PANELS
POLISHED BLACK FINISH

CUT PERFECTLY SQUARE TO ANY SIZE

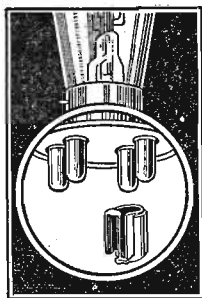
1/32" THICK	1/2¢ PER SQ. INCH
1/16" THICK	3/4¢ PER SQ. INCH
3/32" THICK	1¢ PER SQ. INCH
1/8" THICK	1 1/2¢ PER SQ. INCH
3/16" THICK	2¢ PER SQ. INCH
1/4" THICK	2 1/2¢ PER SQ. INCH
3/8" THICK	4¢ PER SQ. INCH
1/2" THICK	5 1/4¢ PER SQ. INCH

SEND FOR COMPLETE PRICE LIST
PROMPT ATTENTION TO MAIL ORDERS
DEALERS PRICES ON APPLICATION

STARRETT MFG. CO.
519 SOUTH GREEN ST. CHICAGO

GAMBLING?

YOU ARE IF YOUR RADIO TUBES ARE UNPROTECTED



Your Vacuum Tubes are the most delicate parts of your Radio Set.

They are easily blown out—you have probably already had this exasperating experience—it is apt to happen at any time.

"B" Battery wires accidentally crossed for only an instant with the filament leads or sudden excess current from the "A" Battery will do it.

You can prevent this and save yourself money and inconvenience and relieve your mind at a trifling cost.

INSTALL RADECO SAFETY FUSES

on all your tubes. Applied in an instant to one of the filament terminals. Will fit any standard tube going in any standard socket.

Price 50 cents each, sent postpaid and fully guaranteed. Do not delay. Order now. Specify type of tube used.

DEPT. 6

RADIO EQUIPMENT COMPANY

Manufacturers and Distributors of Standard Radio Equipment
630 WASHINGTON STREET BOSTON, MASS.
New England's Oldest Exclusive Radio House
Dealers:—Write for our proposition

Thrills from Radio

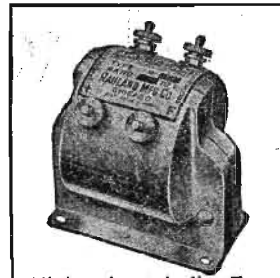
No. 1 of a Series Featuring Experiences of "ALL-AMERICAN" Users

"Got Honolulu from Minneapolis"

By O. C. Besser of Minneapolis

"I used an 'All-American' radio cans" bring in distant and nearby frequency Transformer in a set stations with volume and tone—last summer with very good results. quality that mean real thrills.

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



All-American Audio Frequency Transformer—comes in three ratios.

Without distortion, "All-American"

All the better dealers sell "ALL-AMERICAN"

RAULAND MFG. CO., 200 N. Jefferson St., CHICAGO
PIONEERS IN THE INDUSTRY

AUDIO FREQUENCY



RADIO FREQUENCY

ALL-AMERICAN AMPLIFYING TRANSFORMERS

Largest selling Transformers in the world

N. S. DI Le N. for nou. Bro use buil duri prog Su Sun publ chur Rad: stat lligio M. Stag the ing: tion mus: Tu Day. factc Pron ernr dress noon W. Musi may Th Day. footb many Fri with line c small Sat Home espec Radio Fai To I c FAI travel and N of the be giv who h table s ton an betwe leave just b set, su for sh. A po a spec been in progra tor, th switch the ma deck fe dining tersper ship's all over connect to the put ALL variom circuits Ask to line of satisfac Mo Ges 6es Ins! All- re Moi COLU 157 NO.

SPECIAL PROGRAMS TO FEATURE 'WEEK'

DIRECT ATTENTION TO THE BENEFITS OF RADIO

Leaders Stress Importance of Broadcasts to Churches and to Stage

NEW YORK.—The tentative program for National Radio Week has been announced by the program committee. Broadcasters throughout the country will use the main points of the program to build their individual programs around during the week set aside. The tentative program follows:

Sunday, November 25. National Radio Sunday, at which time the attention of the public will be called to the wonderful church services broadcast, and the use of Radio sets for shut-ins advocated. Every station will be asked to feature its religious program on this day.

Monday, November 26. Radio and the Stage. Showing what Radio has done for the amusement world—programs featuring popular performers and calling attention to what Radio has done for plays and music.

Tuesday, November 27.—Government Day. The possibilities of Radio as a factor in government will be emphasized. Prominent National, State and City government officials will be asked to address the Radio audience. Tuesday afternoon will be devoted to the children.

Wednesday, November 28. Radio and Music (A contest for Wednesday night may be announced in a few days).

Thursday, November 29. Thanksgiving Day. Sports Day. Thanksgiving Day football games will be broadcast from many stations.

Friday, November 30. Education Day, with perhaps some special feature in the line of orchestra music, especially for the smaller stations.

Saturday, December 1. Radio in the Home, Radio for pleasure. Programs especially designed for the basis for home Radio parties, such as dance music.

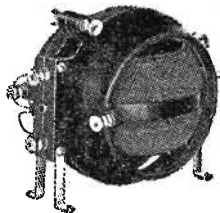
Fall River Boat Puts Public Address Set In

To Entertain Travelers with Received Broadcast Programs

FALL RIVER, MASS.—Radiophans traveling back and forth between Boston and New York on the Steamship Priscilla of the Fall River Line in the future will be given nightly Radio concerts. Those who have been packing along their portable sets to get the concerts from Boston and New York during the night trip between Fall River and New York can leave them at home now, for the ship has just been equipped with a large receiving set, supplementing her regular equipment for ship Radiotelegraph messages.

A powerful public address system, with a special receiving set for broadcasts has been installed. As soon as a satisfactory program has been picked up by the operator, the public address loud speakers are switched on and the music sent out to the main salon, the salon deck aft, salon deck forward, the quarterdeck and the big dining hall. Radio programs will be interspersed with musical numbers by the ship's orchestra, which will also be sent all over the ship by means of a microphone connected from the orchestra's location to the vacuum tube amplifier controlling the public address system.

COLUMBIA ALL-CIRCUIT VARIOMETER



variometer can be used for MILOPLEX circuits.

Price \$5.50

Ask to see the nationally known Columbia line of licensed bakelite apparatus. Known satisfaction. A few more Columbia items:

- Moulded Bakelite Variocoupler.....\$6.00
- Geared Three Coil Mounting..... 5.00
- Geared Two Coil Mounting..... 3.50
- Inside Coil Mounting—"Tuner"..... 6.00
- All-Meter Variocoupler—150 to 2600 msters..... 7.00
- Mounted Coils, Coil Plugs, etc.

Write for our free literature

COLUMBIA RADIO CORP.
157 NORTH UNION STREET, CHICAGO

THREE GUESSES AT THESE THREE ANNOUNCERS



Three more mysterious voices we hear so often! At our left we have Irwin Swindell, WOC musical director, and single may be. Center is WSB's famed Lambdin Kay, and at our right the program director, announcer and miscellaneous "fill-in" entertainer—none other than Jack Nelson of WDAP. Forget it, girls! He's married

Preacher Heralded by WBAP Visions Radio in Hospital

FT. WORTH, TEX.—Establishment of a Radio room in the Methodist hospital to be erected here is the aim of the Reverend Dr. J. W. Bergin, pastor of the First Methodist church, known to Radiophans throughout the country by his sermons broadcast each Sunday over WBAP, the Star-Telegram here. Contributions are being received from listeners in A. L. Johns, a listener to the Sunday morning church services, is the originator of the idea. It is the hope of Dr. Bergin that ultimately every room in the hospital will be equipped with Radio.

Radio Talks in Book Form

MEDFORD HILLSIDE, MASS.—Health talks which were broadcast some time ago for the American Red Cross by WGI have just been published in pamphlet form under the title of "Listen In," by the Boston Metropolitan Chapter of the Red Cross and is being sold at cost by the Boston Chapter.

KELLOGG VARIO-COUPLER



Very high inductance!

—low distributed capacity

Yes, boys! You are right! Our Vario-coupler is of the same staunch and true construction as the Kellogg Variometer. The Bakelite shells are of reinforced rib design. And, as with the Variometer, the air space between stator and rotor windings gives as high a maximum and minimum of inductance as is possible, with low distributed capacity—our special treatment of the Bakelite takes care of that.

Class is dismissed—wait!

It may or may not be of interest to you to know that we make a standard charge of \$9.00 for this piece of work but do not let that deter you. Results, boys, results! That is what we are looking for!

KELLOGG SWITCHBOARD & SUPPLY COMPANY
CHICAGO

FOREST FIRE PLANES EQUIPPED WITH SETS

CFAC Cuts Out Conflicting with Work of Patrol

CALGARY, ALTA.—CFAC, the station of the Calgary Herald here, has abandoned its regular 4 p. m. concert at the request of the department of militia and national defense of the Canadian govern-

ment, owing to the fact that this concert has been found by the department to interfere with communication between forest patrol airplanes and the Dominion Air Board at High River, Alberta. The broadcast will be abandoned for a month, after which it is expected that forest patrols will be unnecessary.

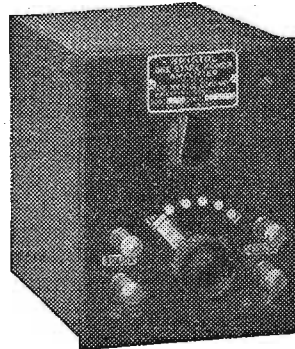
The forest patrol machines are in the air daily from 10 a. m. to 1 p. m. and from 2 p. m. to 5 p. m., watching for forest fires in the foothills of Alberta and British Columbia.

THE AUDIOPHONE

Quality of reproduction such as only the original itself can equal. Speech that is so distinct that the voice heard is the actual voice of the speaker. Music that requires no tolerant imagination to be recognized as music of the finest type.



Bristol's Single Stage Power Amplifier



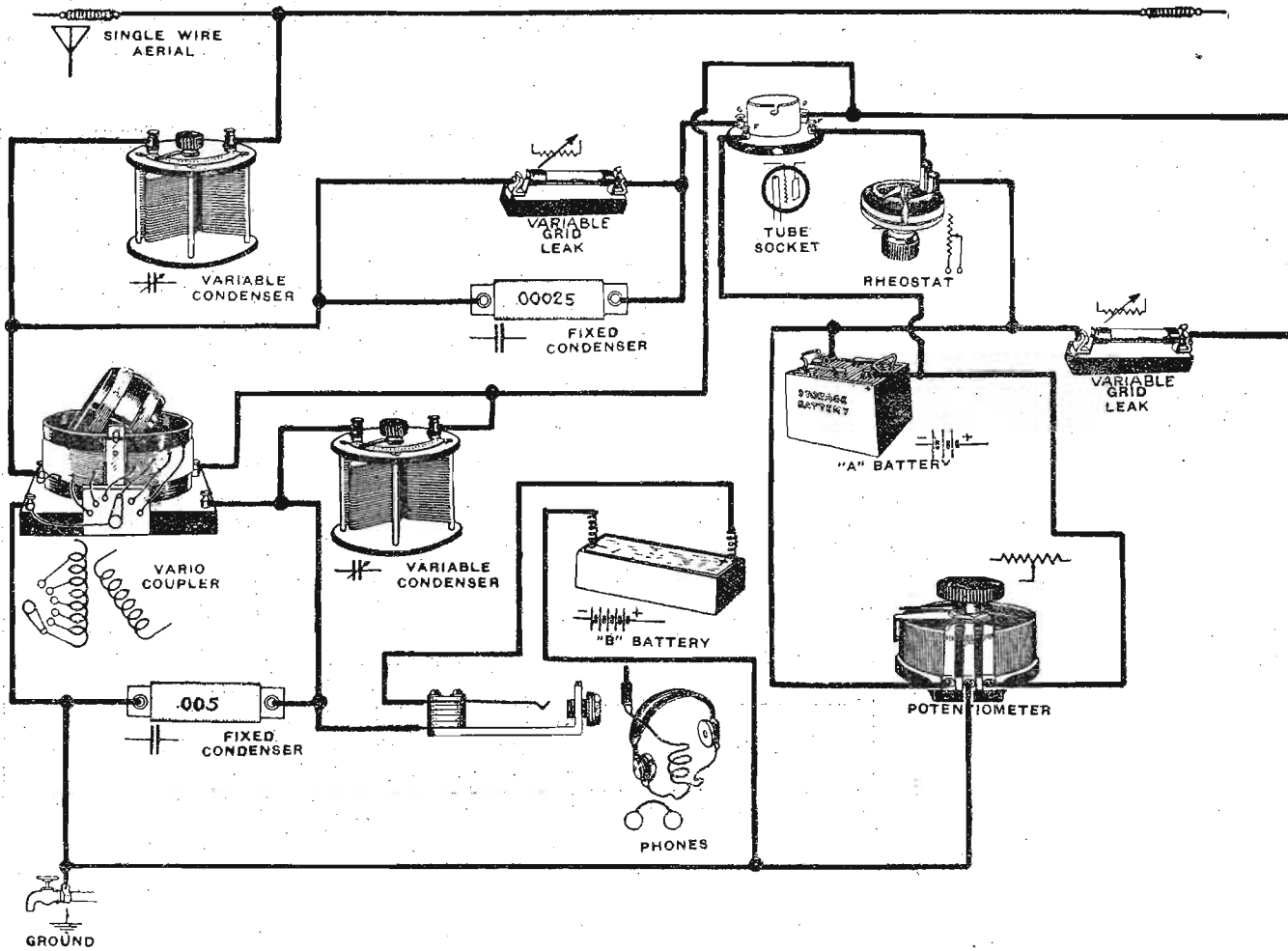
gives additional VOLUME with any two stage amplifier. No separate batteries required. It provides the additional volume necessary to bring in very distant stations on the loud speaker.

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

THE BRISTOL COMPANY
WATERBURY, CONN.

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

A MILOPLEX VARIATION IN SIMPLEX FORM



THE success of the Miloplex has started a number of fans trying different variations. One of those submitted to us is shown in the Simplex diagram.

Although a variocoupler is indicated, the original split variometer arranged will be

preferred by many. The unusual feature is the use of two variable grid leaks to control the grid potential.

Unusually good results were obtained with just a detector tube and a 22½-volt plate battery. Close stations can be very easily separated on account of the high

degree of selectivity of this circuit. Naturally only a good quality of apparatus is recommended.

PATENT ATTORNEYS

PATENTS. Booklet free. Highest references. Best results. WATSON E. COLEMAN, Patent Lawyer, 624 F Street, Washington, D. C.

Applying Shellac

Because shellac dries fast, one must be efficient in spreading it on evenly when finishing a Radio cabinet. If the liquid becomes lumpy when applying it to the surface, the best method is to dip a rag into spirits of alcohol and rub quickly across the length of the article. Renew the alcohol frequently, and do not pause too long in any one spot. When it is finished, lay the cabinet away to dry, and do not attempt to handle it until it is perfectly dry to the touch of the finger tips. Twenty-four hours will suffice.

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

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

RED-HEAD RADIO RECEIVERS

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

JUST OUT

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

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

This is the standard 3,000 ohm "Red-Head." The 1924 Model F has eleven improved features. Sensitive and fine-tuned; aluminum case; famous brown-red ear caps; military headband; high-grade cord.

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

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

What About It?

Isn't it about time to stop experimenting with multiple control circuits and build one that, combining ease of assembly and operation, loudness, clarity and selectivity of signals, as well as beautiful appearance, is excelled by none?

THE ELGIN SUPER-REINARTZ RADIO RECEIVING SET

Embodies all the advantages of the well known Elgin Reinartz (the set which was largely responsible for the popularity of this wonderful circuit) and many others. It is much louder, more selective, requires no storage battery, and can be used with excellent results on a short or loop aerial.

It has brought in California stations two thousand miles from Elgin, clearly and without interference on a loud speaker with only one tube, and that while our powerful local station was broadcasting three miles away.

Could you ask for more?

Write for circular giving one, two and three bulb hook-ups of this remarkable circuit. IT IS FREE.

ELGIN RADIO SUPPLY CO.
207 East Chicago Street ELGIN, ILLINOIS

RADIO HANDBOOK

Only \$1

514 PAGES

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

INTERNATIONAL CORRESPONDENCE SCHOOLS
Box 8278B, Scranton, Penna.

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

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

Complete Parts for Miloplex Circuit—CABINET FREE

1 .0005 Variable Condenser.....	\$4.45	1 Socket, Bakelite base.....	\$.90
1 Estru Variometer.....	5.00	1 Bakelite Panel, 9x14x 3/8.....	2.52
1 .00025 Variable Condenser.....	2.00	1 DeForest D.V.-6 Tube.....	6.50
1 Variable Grid Leak and Condenser.....	1.00	1 B Battery, 22½ volt.....	1.25
1 .002 Phone Condenser.....	.35	3 Dry Cells.....	1.35
3 3/4-Inch Dials, each.....	.75	12 ft. sq., brass, bus wire.....	.30
1 Potentiometer.....	2.20	1 Set-Readem Bind. Posts.....	.75
1 Rheostat, 6 ohms.....	1.00		

ONLY \$28.50

MADERA CLEAR SPEAKER

AT LAST—REAL SPEECH—REAL MUSIC—FROM DIE-CAST WOOD HORN

NO BATTERY REQUIRED

Finished crystallized black and mahogany, complete with unit. Height, 12 inches; diameter bell, 10 inches; absolutely guaranteed. Natural tone from Radio made possible by a new process discovered! We break down wood to original fibre, forcing it into steel dies under twelve tons pressure.

\$15.00

PHONE RECEIVERS

Mico Double Phones "Sealed—Guaranteed" with Head Bands.....	7.00
Double Phone Cord.....	1.00
Genuine Master-Baldwin Type C Unit.....	6.00
Genuine Master-Baldwin Type C Double.....	12.00
Loud Speaker Cord, 20 feet, 4 tips, our price.....	1.00

WIRE

All kinds of wire put up in ¼ pound spools, No. 18 to No. 28, silk, cotton and enamel, double or single..... 45 cents a spool

Same wire as above on ½ pound spools, 75 cents a spool

Hook-up Wire, No. 14 square brass, cut in 6-foot lengths..... 1.3c

RHEOSTATS AND SOCKETS

MARVEL Rheostat, 6 ohms.....	\$.35
MARVEL Rheostat, 20, 25 and 30 ohms.....	.45
MARVEL Rheostat, 40 ohms.....	.55
MARVEL Rheostat, 50 ohms.....	.65
Potentiometer, 200 ohms.....	.55
Potentiometer, 400 ohms.....	.55
Potentiometer, 1,850 ohms, Federal.....	2.20
Standard Sockets, bakelite base, 1.25.....	.75
Na Ald Sockets, 35c; 3 for.....	1.00

GRID-LEAKS

Freshman Grid-Leak with Condenser.....	\$1.00
Freshman Grid-Leak.....	.75

VARIOMETERS

Moulded Variometer.....	List Price \$6.00	Our Price \$4.39
Estru Split Variometer.....	4.50	
Variometer, All Circuits.....	5.50	

VARIOCOUPERS

Moulded Coupler.....	List Price \$5.50	Our Price \$4.19
Moulded Bakelite Variocoupler.....	6.00	
All-Meter Variocoupler, 150-2800 meters.....	7.00	

THE B-T TUNER and "MILOPLEX"

THE ENNIS-HANLY-BLACKBURN COFFEE COMPANY
KANSAS CITY MO.

Bremar-Tully Mfg. Co.
532 S. Canal Street,
Chicago, Illinois.
Oct. 6th, 1923.

Gentlemen:—

I secured a B-T Vernier Tuner last Thursday and hooked it up according to your diagram for the Reinartz circuit and turned her on and found two of our powerful broadcasting stations in the air.

In less than two minutes they were both out of the air so far as I was concerned and ringside reports of a prize-fight were coming in clear and strong from KDKA. I had no trouble in getting Schenectady and stations all over the country, using one V. T. 199 tube.

I have been making some experiments with the so-called "MILOPLEX" circuit, now being featured in the Radio Digest, using the B-T Vernier Tuner, and I have been hearing with the first circuit published, KKH—Los Angeles, with great clearness, on one tube.

Some radio friends were at my house last night, and were loud and long in their praises of your wonderfully efficient instrument, and unless the local dealers are out of them, I am safe in saying that two more were sold about as early this morning as the dealer's doors were opened.

You may feel at entire liberty to use such portions of my letter as you may desire, for any purpose.

Very truly yours,
J. E. Martin.

THE B-T VERNIER TUNING UNIT

The Original 3-Circuit Coupler, with additional loading coil, which may be put in series with any of other windings as required, is a real vernier instrument. Price .. **\$5.00**

Beware of imitations.

Our new booklet on TUNING will help you. Sent postpaid for 10c and dealer's name.

Our 4 to 1 Fixed Coupler, consisting of primary and secondary on Bakelite tube, for mounting on panel, condenser or sub-base, gives excellent results in Reinartz, Ultra Audion, Tuned R. F., etc., but is tuned only by condensers. Price.... **\$1.85**

BREMER TULLY MFG. COMPANY
532 S. CANAL STREET CHICAGO

"Tri-Coil Reflex" RADIO FREQUENCY TRANSFORMER

\$2.00

BINDING POSTS

Readem Binding Posts. Set composed of 1 antenna, 1 ground, 1 A Battery +, 1 A Battery -, 2 tele-phones, 1 B Battery +, 1 B Battery -..... \$.75

VARIABLE CONDENSERS

Variable Condenser, .0005 (Same as 23 plate).....	List Price \$5.50	Our Price \$3.00
Variable Condenser with Vernier, .0005 (Same as 23 plate).....	6.50	4.50
Variable Condenser, .001 (Same as 45 plate).....	6.00	3.50
Variable Condenser, with Vernier, .001.....	7.50	5.00
Walnut Variable Condenser, .00025.....	1.75	

SPECIAL CABINET 9x14x8, dark mahogany finish with baseboard.

ONLY \$3.00

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Further Details of the Famous Miloplex Hook-Up

Part VI—Discussion of the Theory of the Circuit

By the Mystery Man

DIDN'T have so much trouble amplifying the "Plexy," did you? Or did you? Let's hope you didn't, especially if you used the first or second circuit. The real Plexy in circuit Number 3 decides every now and then to make life miserable, until we get just the right biasing capacities, but once set, she speaks Radio almost perfectly, and in addition—well, supposin' you ask your head phones whether they are busy.

Here's a secret; the editor just wrote me a long snappy letter telling me he didn't care anything about my wife, cook or no cook. I never said he did, somebody does, but you haven't got anything on me, Editor. She doesn't care for me, either—I think she did, in fact, I know she called me Daddy until she read what the printer said I said about her in the last issue. Now I don't want no words with the printer, but he's got too much, much too much "wild" type in his factory; a man couldn't say what he said I said about a cook; honest he couldn't. If you don't believe it, just gas out in your Baby Lincoln and note the vacant chair. Certainly, I don't eat; you surely cannot change cooks, even on paper, without printers and employment agencies spoiling the transfer. Verily, I say unto thee and verily I say it wisely: Do right and fear no man, don't write and fear no woman.

Anyway I have the circuit left, so let's discuss it. Theory, you know, is what is supposed to be; practice is, what do be. To explain more clearly: Theoretically, moonshine is blinding—you know what I mean; therefore, in discussing the theory relative to the specific action which is taking place in the Miloplex one must respect many experimenters' views. I know what the mailman thinks, but he should read the letters, they don't pity you at all, Bill.

One very interesting answer arrived telling me that a Radio frequency meter reading proved conclusively that the circuit was a double reflex. Whadaya mean, double reflex? I know it reflexes, but I only found one, still I'm not arguing; then again, my booster in Akron, O., says its true super-regeneration.

Let's stop now—no let's not; why should we care what the bearcat is doing so long as she "brings them in, and parts them." I wouldn't say Mr. Akron was far wrong—and you never can tell, may be absolutely correct. But out of the 103 letters received today, one admirer (you see I have them, as well as the girls) puts up a mighty plausible theory, that at least reads good, and I hope it's true. Here's his theory and story:

"Dear Miloplex:— You know what your circuit is doing, foxy fellow, you're just trying to have us 'guess it,' but if you don't, what were you doing for nine long months?
George."

There you are, "laugh and the world laughs with you, work and you work alone." You know after reading George's letter I now realize what fools those pioneers were, who built paths in the wilderness (see McGuffey's reader); why didn't they wait, let George do it and when paved, order a Yellow; and I cry out in anguish, how pitiless is the spotlight of publicity.

But, George, you're such a good guesser, why not guess when my cook will listen to reason; I must eat.

Oh, yes! A mighty fine chap I know, he is down East (Stapleton, N. Y., was the town) wrote me a sermon, and I had to read it three times before I could understand whether he wanted to "kill me or kiss me." Dandy letter, anyway

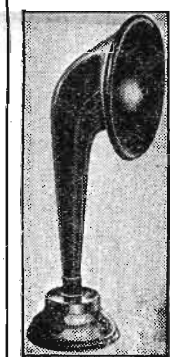
Bunkie, thanks so much. Tell me, does she "soup?"

But we must hustle on; week before last when I sprung the King my pen got the best of me and said something about "a capacity in parallel with an inductance comprising an oscillating circuit;" that was a pretty good hunch that we should watch the action of the variometer rotor. I frankly and truthfully told you that I had the theory, very many times, on the tip of my tongue, but was afraid to open my mouth and possibly lose it. Let me then make this positive statement: "I, the mystery man, do not at this writing possess sufficient evidence to back up any theory regarding the operation of the Miloplex." I expect to have; surely some of you fans are going to nail it down and make it so clear and positive that I will accept it. But now, NO!

The technical Editor and my wife's husband (fixing it) just finished a ten round discussion (referee's decision a draw) on the theory. Engineer Forbes wants another week's time and I've now got my good friend Flewelling interested, so expect him to come through with a reason that will be a whiz. Mercy, he ought to; any man who is clever enough to bring the price down on supers from a 1,500 and 1,200 coil to a piece of wire and a condenser should find the fly in the ointment. Great circuit his; if you didn't make it work, it was your fault, not his.

I rather feel that at least one of my most interesting experiments with Plexy may be of service to you in your work. Each of us have our pet theories as to just what is meant and how we can accomplish regeneration; that is, unless we don't know him when he squeals. But have we realized that it is quite possible that all Radio circuits, irrespective of their design, are in a sense regenerative, barring crystal sets?

Some day when I go through college (back of a broom), I'm going to ask them to show me how to hook up one that isn't. I'm interested and that statement will bring a hundred letters. All I know is that I have up my sleeve (and may publish it some day) a Plexy circuit, using the same third (or should I call it a fourth) circuit scheme given you in the King, which as I wire it is what ninety out of a hundred would call a nonregenerative circuit, yet it acts like one, talks like one, and goes out and gets "west" to movieland, when—well, I ask again, what



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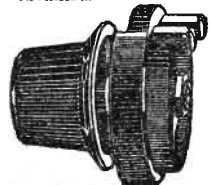
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does one have to do, to get a "kick on the grid?" I'm going to college.

You know, fellow fans, if I may make the statement, every once in a while along comes a fellow who either has not read or, in reading, did not understand certain theories, which have been repeated so often they have become known as facts, fundamental laws, and busts the combination; methinks, Flewelling got the super squeal first and thought of varying frequency afterwards. Had he started on the foundation of theory one wire and a condenser wouldn't be enough tools to produce a varying frequency. You know he is a "coffee hound" and over many a cup we have argued (and agreed) that Radio is as yet a babe in arms, each of us, and you, wondering why.

For years, just because somebody said so, and the textbooks copied it D. C. battery currents were traveling in circuits from positive to negative; then a real fellow asked why; established not a theory but a fact that there was such a thing as electron emission, and every textbook had to go to the Ragman, but the currents kept traveling as they always had, not from positive to negative, but from negative to positive.

Shame to bust the theory, but they did. When I try to tell you the why of the Plexy, my mind travels from nonregenerative on up to the super-heterodyne, and this little fellow seems to have a little of them all. I believe I have enough ink to tell the story, but why tell it when it won't "stay put" in one effect long enough to prove it. We may have to mortgage the farm, but the villain will never worry the girl, Jack Dalton.

The most persistent action occurring in the King is what I choose to call a heterodyne effect. I quite realize just what the textbooks and engineers say we must have and how we must go about it in order to heterodyne, but supposin' this is one of

those cases where we thought—but the current is going the other way, you know what I mean; then bust goes the theory. Whenever I try to make a certain theory "boss," it speaks trouble; it's a good deal like my friend Halloran says is the trouble with Ireland, "They all want to be King;" one Irishman won't be bossed by another, one theory won't let the other win the rubber pointed ice pick.

But there is an answer, as I previously stated; somewhere, somehow, somebody is going to put the police third degree on the Plexy and he will tell the secret. All that I know at present is hundreds of letters are pouring in telling me Plexy is an ear cracker and selective. That helps; if I could only write each of you saying "Thank you," I would. Some day we shall meet "face to face." Until then let me assure you that I would be ungrateful indeed, did I not appreciate your every kind thought. Radio is so young, we in it such dependents, that we require each other's help and counsel, and while possibly the most interesting articles of the series will follow, thanks to each and every one.

Next week I'll tell the engineers' story, one or both of them—one must keep engineers separated you know. Besides, they can then hide behind my skirts (no I'm no lady) and claim they didn't say it.

Following it will be a couple of "try out" tricks on the Plexy, and if I can get my cook back, I may offer you a Plexy reflex with a real crystal rectifier stunt. Seems popular now to reflex; so, wait a minute, there are a lot of cold nights coming. But I must eat, the Editor hasn't fed me for some time—I surely should be able to sell him the idea. I'll try. Napoleon's army, so the story books say, "Marched on their stomachs," but I'm not an army and I have plenty of Bony parts. Let's eat!

(TO BE CONTINUED.)

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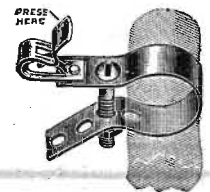
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The Week's Headliners on the Air

ARE YOU interested in Norway, the land of the Mid-night Sun, that strange country across the sea from Labrador? WMAQ is going to bring it closer to you with a program Tuesday night by the Chicago Consulate of Norway. Don't miss these international programs of WMAQ. Are you ambitious to write scenarios? Listen in to Howard King Young at WDT. He will tell you all about it. A real author, Rev. Harry E. Hurd, will read from one of his own books, "The Sky Pilot," at WGI Tuesday night. As you can see from the title, the book must be very high-brow.

So Wednesday night let's frolic and play, for it's old Hallowe'en and the fairies are gay. Make way for Titania, "Queen of the Fairies," for she holds her court under the harvest moon at KHJ. And if you want to feel your hair rise and that tingly feeling down your backbone, listen to the ghostly stories of Hallowe'en at WLW with your light turned low. Finish up with a rollicking Hallowe'en party at WOR. Never mind if you haven't received an invitation, they will never know you are there, and everybody's invited.

I suppose like everybody else, you are interested in the future, even if like me you may scoff and sneer. Well, here's a tip, Belle Bart, the famous astrologist, will be heard Thursday night at WHN. Don't tell anyone I told you. Of course, what you will really want to hear is the concert by the faculty of Oberlin college broadcast at WTAM. Yes, indeed.

Friday let's just be melancholy and sentimental and listen in the Hawaiian music at WHAS or the Beekman Mandolin Orchestra at KHJ.

Are you curious as to how your favorite moving picture star talks? You can hear Richard Barthelmess Saturday at WOR.

I think I will let you take your choice Sunday evening of the grand concert at WFAA, the symphony orchestra at WGY, and the classical program at WJAZ.

Did you ever know that drinking glasses were musical? Charles Wold says they are and he is going to demonstrate the fact Monday noon at WDT.

Drama Notes

Tuesday: WJAR, Radio play, Walter Greenough Players; WFI, Radio play, Strawbridge and Clothier Players.

Wednesday: WOR, Guignol Players in a French play.

Thursday: WJZ, two one-act plays; WGI, Amrad minstrel show; KGW, dramatic program, Red Lantern Players.

Friday: WGY, "Daddy Long-legs," WGY Players; KSD will broadcast entire play of "Dulcy."

Tuesday, October 30

KDKA, E. Pittsburgh, Pa. (Eastern, 536), 6:15 p. m., Dinner concert, Grand Symphony Orchestra; 7:45, Children's period; 8:15, Lecture, John Ray Ewers, D. D., on his recent trip to Europe; 8:30, Concert by mixed quartet and violinist, Chester Humphreys, director.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., J. Howard Johnson, tenor; 10:00-11:00, The Marion Ward Players.

KGW, Portland, Ore. (Pacific, 492), 3:30 p. m., Talk by Jeanette P. Cramer, home economics editor; 8:00, Talk for farmers, Paul V. Maris; 10:00, Dance music, George Olsen and his orchestra.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Concert; 2:30-2:50, Matinee musicale; 8:45-7:30, Children's program; "The Sandman"; 8:00-10:00, Program, Artist pupils of the Zoellner Conservatory of Music; William F. Alder's "Tours do Luxe"; 10:00-12:00, Art Hickman's Orchestra.

KSD, St. Louis, Mo. (Central, 546), 8:00 p. m., Program, West Presbyterian Sunday School Orchestra; J. H. Eggert, director; Addresses, Dr. A. G. Pohlman, B. H. Harrison; 11:00, Dance music, Dave Silverman's Orchestra.

KYW, Chicago, Ill. (Central, 560), 11:35 a. m., Table talk, Mrs. Anna J. Peterson of Peoples Gas Co.; 2:35 p. m., Studio program; 6:50, Children's bedtime story; 8:01, Program, American Farm Bureau Federation, "Field Worker and Wage Worker," J. D. Harper; "Our Farm Boys and Girls," Guy L. Noble; 8:30, Program, Chicago Musical College; Herbie Mintz, pianist; Sallie Menkes, accompanist; "Sen Kaney."

WBAP, Fort Worth, Texas (Central, 476), 7:30-8:30 p. m., Concert, Ina Gilliland and Fort Worth artists; 9:30-10:45, Concert, Choir of the First Baptist Church, J. Dalbert Courts, director.

WBZ, Springfield, Mass. (Eastern, 337), 7:00 p. m., Activities of the Boy Scouts; J. Hamilton Lewis; 7:30, Twilight tales for the kiddies; Third lecture, Household Management Course, Agnes H. Craig; 8:00, I. Hazle Childs, soprano; C. Russell Henderson, ac-



Nikolai Sokoloff (left), is the conductor of the Cleveland Orchestra. Be sure to hear it from WJAX, Thursday, November 1. This organization is internationally famous and worth every listener's time



At 6:30 p. m., Eastern time, daily except Sunday live for the Vincent pez Orches (above), from Orstead of jazz, li to Charles V make music drinking gla Monday, Noven 5, at Station V



Rose Johnson (above) is unusual in that she possesses a double voice, soprano and baritone. She will sing for the Cleveland News-Leader program from WJAX, Tuesday, November 6. She is a vaudeville favorite

Wednesday, October 31

companionist; 9:00, Bedtime story for grown-ups, Orison S. Marden.

WJAR, Philadelphia, Pa. (Eastern, 395), 12:00-12:54 p. m., Organ recital, Stanley Theater; Dinner music, Arcadia Cafe Concert Orchestra; 2:00-3:00, Concert, Arcadia Cafe Concert Orchestra; 4:30-5:55, Artist recital; 7:30-7:45, Bedtime stories, the Dream Daddy; 7:45-8:00, Dramatic review by Walter Greenough.

WDT, New York, N. Y. (Eastern, 405), 12:00-1:00 p. m., Fred Whitehouse Song Revue.

WEAF, New York, N. Y. (Eastern, 492), 7:30 p. m., Tom Thorpe, famous football coach.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., Dewitt McMurtry; 8:30-9:30, Greyhurst & Fisher, English music hall experts; 1:00-12:00, Hazel Spraks, soprano of the Palace Theater, with pianist and cellist.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 3:00, Song recital; 6:30, Dinner music, Meyer Davis Bellevue Stratford Orchestra; 7:30-7:30, Bedtime stories, Cousin Sue; 8:00, Song recital; 9:30, Radio play, Strawbridge and Clothier players.

WGI, Medford Hillside, Mass. (Eastern, 360), 3:00 p. m., Amrad's Women's Club, "Hospitality Talk," Ida Bailey Allen; Descriptive musicale, Chickering & Sons Company; 7:00, Readings, Rev. Harry E. Hurd from his book, "The Sky Pilot"; Music.

WGY, Buffalo, N. Y. (Eastern Standard, 319), 12:30-1:00 p. m., George Albert Bouchard, organist; 4:00, Margaret Blakelee, violinist; Martha Gomp, harpist; Tea time music, Statler Palm Room; 6:30, Vincent Lopez Orchestra; 7:00, Digest of the day's news; Copies of scientific interests.

WGY, Schenectady, N. Y. (Eastern, 380), 2:00 p. m., "Law in the Home," Mrs. C. H. Pearce; 7:45, Concert, Wa-ha-way Chorus of Saratoga Springs.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Selections, Strand Theater Orchestra; "Just Among Home Folks"; Selections, Rialto Theater organ; 7:30-9:00, Concert, Mrs. C. J. Boswell's Hawaiian Sextette; Ersilia Fanelli, soprano; Lionel Whidden, sax solos; Two steel guitars, Mrs. C. J. Boswell, Florence Raucher; Reading, "An Interesting Historical Episode."

WHN, New York, N. Y. (Eastern, 360), 2:15-3:00 p. m., Jimmie Clarke's Songbirds of Irving Berlin Music Co.; 3:45-4:15, Edward B. Marks Music Co.; 11:00-11:30, Shapiro Bernstein Music Co.

WIP, Philadelphia, Pa. (Eastern, 509), 3:00 p. m., Organ recital, Karl Banawitz, Germantown Theater; 3:00, Artist recital; 6:05-6:45, Dinner music, Dick Regan and his WIP Little Symphony Orchestra; 7:00-7:30, Bedtime stories, Uncle Wip; 10:10, Dance music.

WJAX, Cleveland, Ohio (Eastern, 390), 7:30 p. m., Program arranged by the Cleveland News-Leader; 7:30, Bedtime story by E. B. Johnson; 7:45, Old-time songs, Daffodil Club Quartette, Harper Garcia Smythe, director; Dance selections, Emerson Grill Orchestra.

WJAZ, Chicago, Ill. (Central, 447.7), 10:00 p. m.-2 a. m., Program, Florence Claus, soprano; Arnold Michel, baritone; Mrs. Beard, pianist; Oriole Orchestra.

WJZ, New York, N. Y. (Eastern, 455), 3:00 p. m., Leon Tumarkin, pianist; 4:30-6:00, Millie Finck, soprano; "Industrial Hygiene," Dr. Leland Cofer; "Time and Progress," horological talk, Samuel Bernard; "The Boys' Own Book of Inventions," Bloyd Darrow; 7:30, Mary Wilderman, pianist; 8:00, "Broadcasting Broadway," Bertha Brainard; 8:15, Mary Wilderman, pianist; 8:55, Bernard Frank, harmonica solos; 9:50, "Etiquette," 9:00, Dinner of the Merchants Association of New York; John Hays Hammond; Professor David Friday; Willis Booth; Colonel Jay J. Morrow; 10:30, Dance program, Hotel Astor Grill Orchestra.

WLW, Cincinnati, Ohio (Central, 309), 3:00 p. m., Special music, Jennie Kohrt; 10:00, "Frelude to the Deluge," Cletus Mecklenburg, violinist; Flora Metz, accompanist; Duet, Cecilia Schulte, soprano; John Twerck, tenor; "Lassie O' Mine," "Spring's Yesterday," John Twerck; "O Come With Me in the Summer Night," "Lullaby From Jocelyn," Cecilia Schulte; Piano solo, Claire Harkness; Talk, "Life and Happiness," Mary Cornell Stobber; "Romance," Cletus Mecklenburg; "Seventeen," Cecilia Schulte; Violin solo, Cletus Mecklenburg; "Honey Chile," John Twerck.

WMAQ, Chicago, Ill. (Central, 447.5), 4:30 p. m., Program, pupils of Glenn Dillard Gunn School of Music; 7:00, A talk on chemistry, American Chemical Society; Program, Chicago Consulate of Norway; 9:00, Ensemble music, Hotel LaSalle Orchestra; 9:15, Weekly program, Lyon & Healy.

WOC, Davenport, Iowa (Central, 484), 12:00 p. m., Chimes concert; 3:30 p. m., Educational program, A. G. Hinckley; 5:45, Chimes concert.

WOO, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Organ recital, Mary E. Vogt; 12:00-12:55 p. m., Dinner music, Wanamaker Tea Room Orchestra; 4:45-5:55, Concert, George Frerger; 4:00, Tea music, Hotel Commodore Orchestra; 6:00, "The Adventures of Peter," Florence Smith Vincent; 7:30, Allan Gleason, jazz pianist; 7:45, "The Progress of the World," Review of Reviews talk; 8:30, Glukerka Isparieskaia, mezzo-soprano; 9:30, Concert, Charles D. Comarac, director; 10:30, Dance program, Charles Hathaway and his orchestra.

WLW, Cincinnati, Ohio (Central, 309), 8:00 p. m., Part One: Program, Cincinnati College of Music; Part Two: Stories of Hallowe'en, Margaret Spaulding; Popular entertainers with Harvey Brownfield, accordion recording artist for Gennett Records.

WMAQ, Chicago, Ill. (Central, 447.5), 4:30 p. m., Program, Cosmopolitan School of Music and Dramatic Art; 7:00, "King Arthur" stories for children; Georgene Faulkner; 7:30, Weekly lecture from

KDKA, E. Pittsburgh, Pa. (Eastern, 536), 6:30 p. m., Dinner concert, Pittsburgh Athletic Association Orchestra; 7:30, Literary program, Marjory Stewart; 7:45, Children's Period; 8:30, Concert, KDKA Sereaders.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., Nick Harris Concert Co.; 10:00-11:00, Katherine Marshall, soprano.

KGW, Portland, Ore. (Pacific, 392), 3:30 p. m., Children's program; Helen Harper presents violin pupil, pupil of Olga Steeb; 8:00, Concert, Columbia All-Artist Orchestra; 9:00, Business talks, Alexander Hamilton Institute; 10:00, George Olsen and his orchestra; Solos, Mildred G. Smith and LaVelle Epperly.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Elizabeth Copeland, pianist; 2:30-3:30, Matinee musicale, presenting Elizabeth Copeland, pianist, pupil of Olga Steeb; 6:45-7:30, Children's program, "Uncle John"; 8:00-10:00, "Titania," Queen of the Fairies will hold her court at KHJ; Dr. Mars Baumgart, lecturer; 10:00-12:00 p. m., Art Hickman's Orchestra.

KSD, St. Louis, Mo. (Central, 546), 7:00 p. m., Program, Abergh's Concert Ensemble, Arne Arnesen, violinist; 11:00, Dance music, Gene Rodemich's Orchestra.

KYW, Chicago, Ill. (Central, 560), 11:35 a. m., Table talk, Mrs. Anna J. Peterson of Peoples Gas Co.; 6:50 p. m., Children's bedtime story; 8:00, Popular music, Harold Rossiter Music Co.; Herbie Mintz, pianist; 9:05, Reviews of the latest books, Llewellyn Jones.

PWX, Havana, Cuba (Eastern, 400), 9:00-11:30 p. m., National and foreign music, Municipal Band.

WBAP, Fort Worth, Texas (Central, 476), 7:30-8:30 p. m., Concert, Fort Worth artists; 9:30-10:45, Concert, George Freeman's Sooner Sereaders, Texas Hotel Orchestra.

WBZ, Springfield, Mass. (Eastern, 337), 6:00 p. m., Dinner concert, WBZ Trio; 7:30, "Inducement in Circuits," Edward H. Goodrich; 7:00, Twilight tales for the kiddies; "Accidents in the Home," Mrs. A. J. Norton; 8:00, Concert, Willard Clark, baritone; Benjamin Buxton, accompanist; WBZ Trio; 9:00, Bedtime story for grown-ups, Orison S. Marden.

WBA, Philadelphia, Pa. (Eastern, 395), 12:00-12:54 p. m., Organ recital, Stanley Theater; Dinner music, Arcadia Cafe Concert Orchestra; 2:00-3:00, Piano solos, Edna Finestone; 4:45-5:55, Artist recital and short talks; 7:30-7:45, Bedtime stories, Dream Daddy; 7:45-8:00, Current topics by Arthur D. Reese; 9:00, 7:45-8:00, Current topics, Howard Lanin's Arcadia Cafe Orchestra.

WDT, New York, N. Y. (Eastern, 405), 7:00-8:00 p. m., Stage and Screen, Charles R. Jones; "How to Write Scenarios," Howard Young; Standard Review.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., Dallas on story for grown-ups, Orison S. Marden.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00, Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 3:00, Piano solos; 6:30, Dinner music, Meyer Davis Bellevue Stratford Orchestra; 7:00, Bedtime stories, Cousin Sue.

WGI, Medford Hillside, Mass. (Eastern, 360), 6:50 p. m., Gipsy hour, "Camp Fire Girls"; "Big Smoke"; 7:15, "This Week's Jingo"; 7:30, "Science Up to Date," Scientific American; 7:30, Amrad Concert Company, F. Chester MaDan, director; "Magic Minds," David McGregor Cheney.

WGR, Buffalo, N. Y. (Eastern Standard, 319), 12:30-1:00 p. m., George Albert Bouchard, organist; 4:00, Margaret Blakelee, violinist; Martha Gomp, harpist; Tea time music, Statler Palm Room; 6:30, Vincent Lopez Orchestra; 7:00, Digest of the day's news; 9:00, Concert, direction of Roy Noah.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Selections, Strand Theater Orchestra; "Just Among Home Folks"; Selections, Alamo Theater organ; 7:30-9:00, Concert, Helen Eichenberger, pianist; Mary E. Poore, violinist; Howard Koch, violinist; Irene Messberger, soloist; Reading, "An Interesting Historical Episode."

WHN, New York, N. Y. (Eastern, 360), 7:30-8:00 p. m., Clowdy Gardens Orchestra; 8:30-9:00, Martin H. Scheinwald, tenor; 9:00-9:30, Edward B. Marks Music Co.; 11:30-11:45, S. Jay Kauffmann of the N. Y. Evening Telegram.

WIP, Philadelphia, Pa. (Eastern, 509), 3:00 p. m., Artist recital; 7:00, Bedtime stories and roll call by Uncle Wip.

WJAZ, Chicago, Ill. (Central, 447.7), 10:00 p. m.-2:00 a. m., Program, Radio Department of the Wadsworth-Twifchell Piano Company; Oriole Orchestra.

WJZ, New York, N. Y. (Eastern, 455), 3:00 p. m., Readings and songs, George Frerger; 4:00, Tea music, Hotel Commodore Orchestra; 6:00, "The Adventures of Peter," Florence Smith Vincent; 7:30, Allan Gleason, jazz pianist; 7:45, "The Progress of the World," Review of Reviews talk; 8:30, Glukerka Isparieskaia, mezzo-soprano; 9:30, Concert, Charles D. Comarac, director; 10:30, Dance program, Charles Hathaway and his orchestra.

WLW, Cincinnati, Ohio (Central, 309), 8:00 p. m., Part One: Program, Cincinnati College of Music; Part Two: Stories of Hallowe'en, Margaret Spaulding; Popular entertainers with Harvey Brownfield, accordion recording artist for Gennett Records.

WMAQ, Chicago, Ill. (Central, 447.5), 4:30 p. m., Program, Cosmopolitan School of Music and Dramatic Art; 7:00, "King Arthur" stories for children; Georgene Faulkner; 7:30, Weekly lecture from

Thursday, November 1

KDKA, E. Pittsburgh, Pa. (Eastern, 536), 6:15 p. m., Dinner concert, Grand Symphony Orchestra; 7:30, Home program, Frank E. Mullen; 7:45, Children's period; 8:30, Concert, Amanda Vierheller's artistic students in a concert of classics; William Haseman, Jean Woodford Wible, Bertha Gundelfinger, Betty Bell, Blanchard Westler, Hilda Gundelfinger, Robertson Tilton, Carl Ruhe.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., Children's program; "Uncle John"; Selections by the Pasadena, Calif., Five and Drum Corps; 8:00-10:00, Program, Fuhrer String Quartet, Bessie Fuhrer Erb, first violinist; Ethelwyn Conroy, second violinist; Lucy Fuhrer Center, cellist; Nan Aylsworth Ghist, violinist; 10:00-12:00, Art Hickman's Orchestra.

KYW, Chicago, Ill. (Central, 560), 11:35 a. m., Table talk, Mrs. Anna J. Peterson of Peoples Gas Co.; 2:35 p. m., Studio program; 6:30, Children's bedtime story; 8:00, Concert phoned from Orchestra Hall, Edison Symphony Orchestra, Morgan L. Eastman, director; Louis DeMert, baritone; J. Chiera, trombone; 9:05, Twenty minutes of good reading, Rev. C. J. Perrin.

WBAP, Fort Worth, Texas (Central, 476), 7:30-8:30 p. m., Concert, Fort Worth artists; 9:30-10:45, Euterpean Club of Fort Worth.

WBZ, Springfield, Mass. (Eastern, 337), 7:30 p. m., Twilight tales for the kiddies; "Humor in Fiction," Dr. J. Berg Esenwein; 8:00, Mrs. Lulu Sackett Morgan, soprano; Mrs. Eleanor Turner LaZazzera, accompanist; Miss Glenn Robinson, pianist; 9:00, Bedtime story for grown-ups, Orison S. Marden.

WBA, Philadelphia, Pa. (Eastern, 395), 12:00-12:54 p. m., Organ recital, Stanley Theater; Dinner music, Arcadia Cafe Concert Orchestra; 2:00-3:00, Concert, Arcadia Cafe Orchestra; 4:30-5:55, Song recital; 7:30-8:00, Bedtime stories, Dream Daddy.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., Address, L. F. McKay, American Cotton Association; 6:30-9:30, Musical recital, Haulea School of Hawaiian Music, Bobby Kuna, native Hawaiian.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Northwestern University; 9:00, Ensemble music, Hotel LaSalle Orchestra; 9:15, Edith Fletcher, soprano; Robert MacDonald, pianist.

WGC, Davenport, Iowa (Central, 484), 12:00 m., Chinese concert; 3:30 p. m., Lecture, Clyde G. Kern; 6:30 p. m., Sandman's visit; 8:00, Pipe organ recital, Erwin Swindell; May Chambers, soprano; 10:00, Program by group of artists from Maquoketa, Iowa, Pearl Bennett-Brason, director.

WOD, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Organ recital, Mary E. Vogt; 12:00-12:55 p. m., Dinner music, Wanamaker Tea Room Orchestra; 4:45-5:00, Organ recital, Mary E. Vogt.

WOS, Jefferson City, Mo. (Central, 440.9), 8:00-9:30 p. m., Musical program, Mrs. W. W. Bratton, director; Address, member of Missouri College of Agriculture faculty.

WOR, Newark, N. J. (Eastern, 405), 2:30-3:00 p. m., Broadway Sereaders in popular songs and sketches; 3:00-3:30, Grand Guignol Players in a French play; 3:30-3:45, Talk by J. J. Mitchell, "Women and the Income Tax"; 6:30-6:45, Albert Souin in a talk, "Radio for the Dayman"; 8:00-8:30, Meeting of the Lion's Club of Newark on "Everything"; 8:30-10:00, Hallowe'en party at station, including ghost stories; 10:00-11:00, American Guard Band.

WTAM, Cleveland, Ohio (Eastern, 390), 8:00 p. m., Short program of vocal and instrumental numbers by members of the Willard Storage Battery Company Music Club; 9:00, Hallowe'en dance program, WTAM Orchestra.

WWJ, Detroit, Mich. (Eastern, 517), 9:30 a. m., "Tonight's Dinner," Woman's Editor; 3:00 p. m., Detroit News Orchestra; 7:00, Detroit News Orchestra; Town Crier; Vocal program, George Carr.

A NOTE FOR BOYS AND GIRLS ONLY

OF COURSE

I know that boys and girls I grown-up thin They can en jazz and gra opera singers a jokes and lectu just as well you and I, in sp of what anybc may say. Ho ever, each we they have th own progr that only th themselves c understand, an think grown-u should not lis in, because th wouldn't appriate a thing th heard. All pare had better wi draw and lez the headset ak when the follo ing are on the a

Tuesday: KY "Our Farm B and Girls," G L. Noble; W G "The Boys' O Book of Inv tation"; Floyd D row.

Wednesday WMAQ, "Ki Arthur Storie Georgene Fau ner; WGI, "Ca Fire Girls," "Big Smoke."

Thursday: W Boy Scout Ra Corps; WMA Weekly talk Boy Scouts.

Friday: KDF Boy Scout P gram, Richa Victor, J WMAQ, Wee "Wide Awa Club," M Ford; KH Franklin Hi School Boys' C Club.

Saturday: KG Theresa, K el child pianist.

PROGRAMS DURING CURRENT WEEK



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Margaret Martin
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NOTE FOR S AND ONLY

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Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 3:00, Song recital; Strawbridge and Clothier Male Quartet; 6:30, Dinner music, Meyer Davis Bellevue Stratford Orchestra; 7:00, Bedtime stories, Cousin Sue; 8:00, Boy Scouts Radio Corps; 8:45, Dance music, Jack Leroy and his Manhattan Melody Men from Gateway Tea Gardens.

WGI, Bedford Hills, Mass. (Eastern, 360), 7:00 p. m., "Bits of Wisdom," George B. Beal; Amrad Musical Show, C. R. Emory, director.

WGR, Buffalo, N. Y. (Eastern Standard, 319), 12:30-1:00 p. m., George Albert Bouchard, organist; 4:00, Margaret Blakeslee, violinist; Martha Gomph, harpist; Tea time music, Stetler Palm Room; 6:30, Vincent Lopez Orchestra; 7:00, Digest of the day's news; Boy Scout Radio Program, Employment Bulletin, Story from "The American Boy" magazine.

WGY, Schenectady, N. Y. (Eastern, 380), 2:00 p. m., "For Whom Should We Vote?," Irene B. Taylor, Schenectady County W. C. T. U.; 7:45, "A Few Moments With New Books," William F. Jacob; Controy's Marimba Orchestra; 9:00, Ovis Male Quartet; John DeBell, tenor; Seldon Heath, tenor; Clifford Read, baritone; Philip Barnhart, bass; Mrs. Thomas F. Luther, contralto; Melrose Orchestra; "Regenera-tive Electric Braking," W. D. Bearce.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Selections, Strand Theater Orchestra; Harry S. Currie, director; "Just Among Home Folks"; Selections, Rialto Theater organ; 7:30-9:00, The Ten Best Post-war Songs, Courier-Journal Quartette, Charles Shan-nan, soprano; Mrs. K. W. Surman, contralto; W. W. Surman, tenor; Albion S. Cornwall, baritone; Mrs. Albion S. Cornwall, accompanist; Reading, "An In-teresting Historical Episode."

WHN, New York, N. Y. (Eastern, 360), 2:15-3:00 p. m., Shapiro Bernstein Music Co.; 9:30-9:45, Saranoff and His Wigwam Orchestra; Benny Leonard, light-weight champion; 9:45-9:50, Bella Bart, astrologist; 9:50-10:00, Harry Richmond of the Wigwam Cafe, recitations; 10:00-10:30, Roy Cahnley's Orchestra; 10:30-11:00, Fred Fischer Music Co.

WIP, Philadelphia, Pa. (Eastern, 509), 3:00 p. m., Artist recital; 7:00-7:30, Bedtime stories, Uncle Wip; 8:00, Short talk; 8:15, Dance music, Ace Harmon; His Ten Virgins from Hotel Walton roof; 9:00, Organ recital, Karl Bonawitz, Germantown Theater; 10:15, Dance music, Charlie Kerr and His Orchestra from St. James Hotel.

WIAX, Cleveland, Ohio (Eastern, 390), 8:00 p. m., Concert program by the faculty of the Oberlin (Ohio) Conservatory of Music; Trio in A flat, allegro, Maurice P. Kessler, violin; Frederick A. Goerner, cello; Josephine Coyle, soprano; 8:10, Dance pro-gram, Marshall's Orchestra; 8:00, "Jack Rabbit Stories," David Cory; 7:45, Popular songs, Jack Oliver; 8:15, Evening organ recital, J. Thurston Noe; Lilian Hunsicker, soprano; 9:00, Concert, J. E. K. Trio; 10:00, John Leander, bass; Adele Ham-ber, soprano; 10:30, Dance program, Hotel Commo-dore Dance Orchestra.

WLW, Cincinnati, Ohio (Central, 309), 4:00 p. m., Classical piano selections, Adelaide April; 10:00, Persian program; Music, Cincinnati Conservatory of Music; Idella Banker, soprano; Lucy de Young, con-tracto; Richard Pavez, tenor; Howard Fouldner, baritone; Readings, "Rubaivav," Crosley Radarians, Helen Rose, Willard Crain, Dorothy Hecker; Part Two; Eastern Hills Dance Orchestra.

WMAQ, Chicago, Ill. (Central, 447.5), 4:30 p. m., Pupils of Lyceum Arts Conservatory; 7:00, Weekly talk to Boy Scouts; Weekly talk, Rockwell Stephens; 7:30, Lecture, Art Institute of Chicago; 9:00, Ensem-ble music, Hotel LaSalle Orchestra; 9:15, Consonella Lampton, pianist; Austin Augell, tenor.

WOC, Davenport, Iowa (Central, 484), 12:30 m., Chimes concert; 3:30 p. m., Karl G. Stephan, lec-

turer; 5:45, Chimes concert; 6:30, Sandman's visit; 8:00, P. S. C. Orchestra; V. B. Roehle, baritone.

WOO, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Dinner music, Wanamaker Tea Room Orches-tra; 4:45-5:00, Organ recital, Mary E. Vogt; 12:00-12:55 p. m., Dinner music, Adelphi Tea Room Orchestra; 8:30, Humorous monologue; 9:30, Organ recital, Mary E. Vogt.

WOR, Newark, N. J. (Eastern, 405), 2:30-3:00 p. m., Danne and Leo Donnelly of Greenwic; Village Follies; 6:15-7:15, "Musical While You Dine," by Tom Cooper's Country Club Orchestra.

WWJ, Detroit, Mich. (Eastern, 517), 9:30 a. m., "To-night's Dinner," Woman's Editor; 3:00 p. m., De-troit News Orchestra; 7:00, Detroit News Orchestra; Town Crier; Mt. Clemens Church Choir.

Friday, November 2

KDKA, E. Pittsburgh, Pa. (Eastern, 536), 6:15 p. m., Organ recital, Lucile Hale; 7:45, Children's period; 8:15, Boy Scout program, Richard Victor, Jr., scout-master; 8:45, Concert, pupils of Amanda Vierheller; Corinne Gerstner, Jean W. White, Bertha Gundel-finger, Betty Bell, Thelma Dyer Barbin, Carl Ruhe, Blanchard Wester, Hilda Gundelfinger, William Has-selman, Robert Tilton, Chauncey Parsons.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., Birkel Music Co.; 10:00-11:00, K. M. B. Con-cert Co.

KGW, Portland, Ore. (Pacific, 492), 3:30 p. m., "The Noon Meal at School," Margery M. Smith; 8:15, Studio program of dance music, George Olsen and his orchestra; 9:00, "Oregon Resources," Prof. A. L. Lomax; 10:30, Hoot Owls with Pantages Frolic.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Concert program; 2:30-3:30, Matinee musicale; 6:45-7:00, Children's program, "Uncle John"; 7:00-7:30, Organ recital from the First Methodist Epis-copal Church, Arthur Blakeley, organist; 8:00-10:00, Program, the Beckman Mandolin Orchestra, com-posed of Mrs. Alma Pappa, Frank Folsom, Mrs. Ellen Meder, Mrs. R. C. Gregory, mandolinist; Mrs. L. P. Russell, guitarist; "Mission San Diego," Walter F. McEntire; "The Method of Science," Prof. John C. Shedd; 10:00-12:00, Art Hickman's Orchestra.

KSD, St. Louis, Mo. (Central, 546), 8:00 p. m., "Dulcy," play broadcast from the Empress Theater, Woodward Players.

KYW, Chicago, Ill. (Central, 560), 11:35 a. m., Table Talk, Mrs. Anna J. Peterson; 6:50 p. m., Children's bedtime story; 10:00-11:30, Midnight Review; Mar-garet Martin, soprano; Sallie Menkes, accompanist; Harbie Mintz, pianist; "Sen Kaney," specialty act.

WBAP, Fort Worth, Texas (Central, 476), 7:30-8:30 p. m., Concert, Texas Christian University, Prof. H. D. Guelick, director; 9:30-10:45, Concert, Girls' Man-dolin Club Orchestra of the Knights of Pythias Home.

WBZ, Springfield, Mass. (Eastern, 337), 6:00 p. m., Dinner concert, WBZ Trio; 7:30, Twilight tales for the kiddies; Current book review, R. A. MacDon-ald of the Knott Square Book Store; 8:00, Concert, Mrs. Hazel Kibball, soprano; WBZ Trio; 9:00, Bed-time story, Orison S. Marden.

WDAR, Philadelphia, Pa. (Eastern, 395), 12:00-12:54 p. m., Organ recital, Stanley Theater; Dinner music, Arcadia Cafe Concert Orchestra; 2:00-3:00, Piano solos by Edna Finestone; 4:30-5:55, Program of Dream Daddy; 7:45-8:00, Bedtime stories by the Dream Daddy; 7:45-8:00, Bedtime stories by Doris Hyde; 8:00, Radio play by the Walter Greenough Play-ers; 10:10, Dance music by Howard Lanin's Arcadia Cafe Orchestra and special "Morning Glory Club" fea-tures.

WDT, New York, N. Y. (Eastern, 405), 12:00-1:00 p. m., Astrology, Dr. A. Brooks; 11:00-12:00 midnight, Vaughn De Leath's Sherwood Orchestra in a dance program.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., Address, Dr. Robert Stewart Hyer; 8:30-9:30, Sherry Lee Alley and his orchestra.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Dinner music, Meyer Davis Bellevue Stratford Con-cert Orchestra; 3:00, Piano solos, Loretta Kerk; 7:00, Safety talk by Stanley Cowman.

WGI, Medford Hills, Mass. (Eastern, 360), 3:00 p. m., Amrad Records Music Club, "Cranberry Sauce," Mrs. Dorothy H. Goodwin; Edison program; 7:30, Selected verses, Charles L. H. Wagner, Radio poet; Trif's College Night, debate on the subject of the "World Court"; College Orchestra.

WGR, Buffalo, N. Y. (Eastern Standard, 319), 12:30-1:00 p. m., George Albert Bouchard, organist; 4:00, Margaret Blakeslee, violinist; Martha Gomph, harp-ist; Tea time music, Stetler Palm Room; 6:30, Vin-cent Lopez Orchestra; 7:00, Digest of the day's news; Report reports; 9:00, Concert, featuring Elinor Taft, violinist.

WGY, Schenectady, N. Y. (Eastern, 380), 2:00 p. m., "Hints on Buying Rugs," Modern Priscilla; 6:30, Children's program; 7:45, Radio play, "Daddy Long Legs," WGY Players; 10:30, WGY Orchestra; Bertha Lloyd, soprano; Ernest Burleigh, cellist; Kitty Mel-nhold, pianist.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Selections, Strand Theater Orchestra, Harry S. Currie, director; "Just Among Home Folks"; Selections, Alamo Theater organ; 7:30-9:00, Concert, Henry L. Dixon Hawaiian Music Studio; Reading, "An Interesting Historical Episode."

WHK, Cleveland, Ohio (Eastern, 283), 8:00 p. m., Popular concert program, WHK Orchestra and soloists.

WHN, New York, N. Y. (Eastern, 360), 2:15-2:45 p. m., Original Indiana Five Orchestra; 3:45-4:00, Daisy Neibling soprano; 5:00-5:30, Marshall Dance Or-chestra; 9:45-10:15, Martinez Dance Club Orchestra; 10:15-10:45, Fred Whitehouse Review.

WIP, Philadelphia, Pa. (Eastern, 509), 3:00 p. m., Program of popular songs; 7:00 Bedtime stories by Uncle Wip.

WIJAZ, Chicago, Ill. (Central, 447.5), 10:00 p. m.-2:00 a. m., Program, Wurlitzer Piano Company; Oriole Orchestra.

WIZ, New York, N. Y. (Eastern, 455), 3:00 p. m., Organ recital, Leo Riggs; 4:00, Fashion Develop-ments of the Minute, Women's Wear; 4:05, Recital, Doris Coxon, soprano; 4:30, "Farmers' Wives of Yes-terday and Today," Mary Reynolds; 4:50, Whistling solos, Emanuel Bachstadt; 5:05, Narinshu, Russia's greatest woman pianist; 7:30, Evelyn Schiff, singer; 8:15, "Sports," William Slocum; 8:30, Rinaldo Sid-oll, violinist; 10:35, L. Dover Henderson, soprano.

WMAQ, Chicago, Ill. (Central, 447.5), 4:30 p. m., Pit-tpills Bush Conservatory of Music; 7:00, "Wide Awake Club," Mrs. Frances Ford, director; 7:30, Musical lecture, Mrs. Marx E. Oberndorfer; 9:00, Ensemble music, Hotel LaSalle Orchestra; 9:15, Program, Cos-mopolitan School of Music and Dramatic Art.

WOC, Davenport, Iowa (Central, 484), 12:00 m., Chimes concert; 3:30 p. m., C. C. Flanagan, lecturer; 5:45, Chimes concert; 6:30, Sandman's visit; 8:00, Pro-gram, Choir of the Sacred Heart Church, Phil Looen, director.

WOO, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Dinner music, Wanamaker Tea Room Orchestra; 4:45-5:00, Organ recital, Mary E. Vogt; 7:45, Dinner music, Adelphi Hotel Orchestra; 9:00, WOO Orches-tra, Robert E. Golden, director; 10:10, Dance music, Adelphi Hotel Orchestra.

WOR, Newark, N. J. (Eastern, 405), 3:00-3:30 p. m., Talk by Mrs. James Russel Parsons, one of the "Half Hours with Famous Women"; 6:30-7:00, Man in the Moon Story for children.

WWJ, Detroit, Mich. (Eastern, 517), 9:30 a. m., "To-night's Dinner," Woman's Editor; 3:00 p. m., De-troit News Orchestra; 7:00, Detroit News Orchestra; Mrs. Percy M. Earl, pianist; C. Bruce Myers, barito- tone.

Saturday, November 3

KDKA, E. Pittsburgh, Pa. (Eastern, 536), 6:15 p. m., Dinner concert, Westinghouse Band; 7:30, "Bring-ing the World to America," by "Our World"; 7:45, Children's period; 8:30, Concert, Westinghouse Band.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., Carl Edward Hatch, violinist; 8:00-9:00, Cass Concert Co.; 10:00-11:00, Eunice Ross, contralto.

KGW, Portland, Ore. (Pacific, 492), 3:30 p. m., Chil-dren's program, Mrs. Lucien Beck, presenter; Thelma Kobb, pianist; story by Aunt Nell; 10:00, Dance music, George Olsen and his orchestra.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Concert program, Franklin High School Boys' Glee Club; 2:30-3:30, Matinee musicale, presented by the Franklin High School Glee Club; 6:45-7:30, Chil-dren's program; 8:00-10:00, De Luxe program.

KSD, St. Louis, Mo. (Central, 546), 8:00 p. m., Pro-gram broadcast direct from the Missouri Theater.

KYW, Chicago, Ill. (Central, 560), 11:35 a. m., Table talk, Mrs. Anna J. Peterson; 6:50 p. m., Children's bedtime story; 8:00, Musical program; 9:05, "Under the Evening Lamp," Youth's Companion.

WBAP, Fort Worth, Texas (Central, 476), 7:00-7:30 p. m., Review of the interdenominational Sunday School lesson and radio Bible class, Mrs. W. F. Barnum.

WBZ, Springfield, Mass. (Eastern, 337), 7:00 p. m., Dinner concert, Hotel Kimball Trio, Jan Geerts, vi-olinist; Angela G. Lonergan, cellist; Paul Lawrence, pianist; 7:30, Twilight Tales for the Kiddies; "This Week's Judge," 8:00, Charles L. H. Wagner, poet; 9:00, Bedtime Story for Grown-ups, Orison S. Mar- den.

WDAR, Philadelphia, Pa. (Eastern, 395), 12:00-12:54 p. m., Organ recital, Stanley Theater; Dinner music, Arcadia Cafe Concert Orchestra; 2:00-3:00, Concert, Arcadia Cafe Concert Orchestra; 4:30-5:55, Short Talks; Musical program; 7:30-8:00, Bedtime stories by Dream Daddy.

WDT, New York, N. Y. (Eastern, 405), 12:00-1:00 p. m., "Tinkerman and the Winged Taxi," Edith J. Craine; Banjo solos; May S. Breen and her orchestra.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., Address, Professor J. D. Boon, Southern Methodist University, chair of astronomy; Piano airs by Red-head Girl; 8:30-9:30, Sanger Bros' Orchestra and Choral Club; 11:00-12:00, Mrs. O. Ledford, reader and pianist.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Dinner music, Meyer Davis Bellevue Stratford Con-cert Orchestra; 3:00, Program of popular dance music; 6:30, Dinner music, Meyer Davis Bellevue Stratford Orchestra; 7:00-7:30, Bedtime stories, Cousin Sue; 8:00 p. m., Song recital.

WGI, Medford Hills, Mass. (Eastern, 360), 7:30 p. m., New England Business Problems, Arthur R. Curnick; Radio Drama, Amrad Concert Company.

WGR, Buffalo, N. Y. (Eastern Standard, 319), 12:30-1:00 p. m., George Albert Bouchard, organist; 4:00, Margaret Blakeslee, violinist; Martha Gomph, harp-ist; Tea time music, Stetler Palm Room; 6:30, Vin-cent Lopez Orchestra.

WGY, Schenectady, N. Y. (Eastern, 380), 9:00 p. m., Phil Romano's Rainbow Orchestra.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m.,

Sunday, November 4

KFI, Los Angeles, Calif. (Pacific, 469), 10:00-10:45 a. m., Church services, L. A. Church Federation; 4:00-5:00 p. m., Services, Federated Church Musi-cians; 6:45-7:30, Dr. Arthur Tracie White; 10:00-11:00, Theron Bennett, Orchestra leader.

KHJ, Los Angeles, Calif. (Pacific, 395), 10:00 a. m., Sermon; 10:30-12:30 p. m., Organ recital and reli-gious service of First Methodist Episcopal Church; 7:00-7:30, Organ recital from First M. E. Church, Arthur Blakeley, organist.

KYW, Chicago, Ill. (Central, 560), 11:00 a. m., Cen-tral Church service, Orchestra Hall; Dr. Frederick F. Shannon, pastor; 6:30 p. m., Excerpts from the New Testament—An American Translation, Prof. Edgar J. Goodspeed; read by William Ziegler Nourse; 7:00, Chicago Sunday Evening Club.

WDAR, Philadelphia, Pa. (Eastern, 395), 2:00-4:00 p. m., Program of popular classical selections, Arca-dia Cafe Concert Orchestra; Perci Sarkoz, director.

WFAA, Dallas, Texas (Central, 476), 2:30-3:30 p. m., Radio Chapel Bible Class, Dr. William M. Anderson, Jr.; 4:00-5:00, Grand concert by the Orchestra, Dan Albert, director; 7:30-9:00, Church services, First Bap-tist Church, Dr. George W. Truett, pastor.

WFI, Philadelphia, Pa. (Eastern, 395), 7:30 p. m., Church services from Arch Street Presbyterian Church; Organ recital.

WGI, Medford Hills, Mass. (Eastern, 360), 4:00 p. m., Twilight program; "Adventure Hour," Youth's Companion; The Rictor Quartet of Tufts College; Henry E. Lewis, baritone; 8:30, Talk on "World Unity," auspices of Mass. Federation of Churches; Music.

WGR, Buffalo, N. Y. (Eastern Standard, 319), 3:00 p. m., Vesper service.

WGY, Schenectady, N. Y. (Eastern, 380), 11:00 a. m., Service, First Presbyterian Church, Rev. Robert W. Anthony, pastor; 2:30 p. m., Program, WGY Sym-phony Orchestra; 7:30, Combined Evening Worship of the Presbyterian Churches of Schenectady.

WHAS, Louisville, Ky. (Central, 400), 9:57 a. m., Organ music; 10:00, Church services, Fourth Avenue Presbyterian Church, Rev. Dr. Charles V. Welch, pastor; 4:00-5:00 p. m., Concert auspices, Myrtle George Strings.

WHK, Cleveland, Ohio (Eastern, 283), 8:00 p. m., Concert program, WHK Trio; Sermon, Glenville Pres-byterian Church, Rev. A. H. Limouze, pastor.

WHN, New York, N. Y. (Eastern, 360), 3:00-4:30 p. m., Christian Endeavor Union; 4:30-4:45, Jack Schwab, baritone; 4:45-5:00, Nina E. Puman, con-tracto; 5:00-5:10, Speaker from National Security League; 5:10-5:45, Jack Berger's Orchestra.

Monday, November 5

WDAR, Philadelphia, Pa. (Eastern, 395), 12:00-12:54 p. m., Organ recital, Stanley Theater; Dinner music, Arcadia Cafe Concert Orchestra; 2:00-3:00, Concert, Arcadia Cafe Concert Orchestra; 4:30-5:55, Piano solos, Edna Finestone; Song recital; 7:30-7:45, Bed-time stories, Dream Daddy.

WDT, New York, N. Y. (Eastern, 405), 11:00-12:00 p. m., Musical Glasses, Charles Wold; Vaughn De Leath's Merry Makers.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Dinner music, Bellevue Stratford Orchestra; 3:00, Short educational talk; 6:30, Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 7:00, Bedtime stories, Cousin Sue.

WGR, Buffalo, N. Y. (Eastern Standard, 319), 12:30-1:00 p. m., George Albert Bouchard, organist; 4:00, Margaret Blakeslee, violinist; Martha Gomph, harp-ist; Tea time music, Stetler Palm Room; 6:30, Vin-cent Lopez Orchestra; 7:00, Digest of the day's news; 9:00, Mixed program, direction of Herbert Taylor.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Selections, Strand Theater Orchestra, Harry S. Currie, director; "Just Among Home Folks"; Selections, Alamo Theater organ.

WHAZ, Troy, N. Y. (Eastern, 380), 9:00 p. m., Popu-lar music, Middlebrook's Women's Society Orchestra.

WHN, New York, N. Y. (Eastern, 360), 4:00-4:30 p. m., Fred Fischer Music Co.; 4:30-5:00, Popular music, Edward B. Marks Music Co.; 7:30-8:00, Lanin's Roseland Dance Orchestra; 9:45-10:15, Colonial Dance Orchestra.

WLW, Cincinnati, O. (Central, 309), 3:00 p. m., Spe-cial music, Jennie Kehrt; 8:00, Program, auspices of the Editorial Staff of Sunday School Magazine, Methodist Book Concern; 9:00, Roger Hill Dance Or-chestra; 9:30, Crosley Theatrical Reviews; Harry Burkhardt, baritone; Mrs. Burkhardt, accompanist; Mrs. Pilgrim Schwab, soprano; 9:45, Roger Hill Dance Orchestra.

WOO, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Organ recital, Mary E. Vogt; 12:00-12:55 p. m., Dinner music, Wanamaker Tea Room Orches-tra; 4:45-5:00, Organ recital, Mary E. Vogt; 7:45, Dinner music, Hotel Adelphi Orchestra; 8:30, Humorous monologue by Ralph Bingham; 9:00, WOO Orches-tra; Robert E. Golden, director; 10:10, Dance music, Hotel Adelphi Roof Garden Orchestra.

WOR, Newark, N. J. (Eastern, 405), 8:00-8:15 p. m., A talk, "Current Motion Pictures," by A. J. McCosker of the N. Y. Morning Telegraph; 8:15-8:30 p. m., Harold Hanson, tenor; 8:30-8:45 p. m., A les-son in cartooning by Jolly Bill Stenzen; 6:45-9:00 p. m., Harold Hanson, tenor.

SETS

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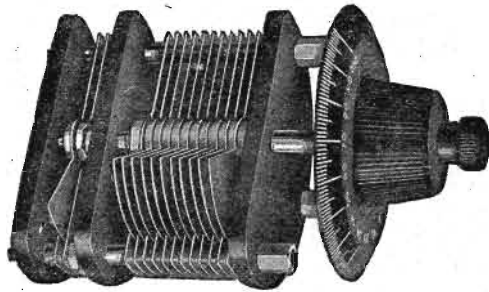
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			43 Plate	4.00	1.95

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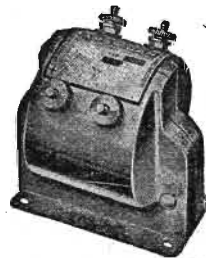
	List Price	Our Price
Brandes Superior	\$ 6.00	\$4.95
Nath. Baldwin, Pair	12.00	9.45
Nath. Baldwin, Single, with 6 ft. cord	6.00	4.95
N & K, 6,000 ohms, made in Germany	16.00	6.50
Dr. Seibt, 6,000 ohms, made in Germany	20.00	7.50
Rico, 3,000 ohms	6.50	3.95
Potter Precision	9.00	4.95

Batteries

Size	Eveready Burgess Franco	Perfection Guaranteed Quality	Bright Star
22 1/2 Small	\$1.20	\$.90	\$1.25
22 1/2 Large	2.25	1.75	1.95
45 Small	...	2.75	...
45 Large	3.75	3.25	3.45

ALL BATTERIES Are Variable

Audio Transformers

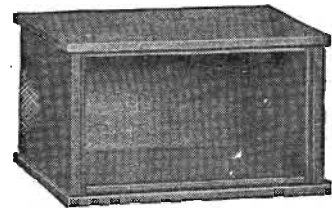


	List Price	Our Price
PERFECTION Spec. Quality, 5 to 1	\$5.00	\$3.50
Franco, 5 to 1	5.00	3.75
Franco, 10 to 1	5.00	3.75
All American	4.75	3.75
Erla	5.00	4.75
Amertran	7.00	5.95
Marle (De Forest)	4.00	3.25
Acme "A2S"	5.00	3.95
Thordarson, 3 1/2 to 1	4.50	3.25
Thordarson, 6 to 1	5.00	3.75
Como Push-Pull, Pair	12.50	11.00

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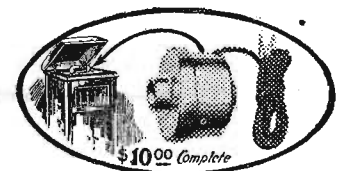
Size	Natural Finish	Mahog. Fin.	Gen. Mahog.
7x10x7	\$2.25	\$2.75	\$3.95
7x12x7	2.35	2.75	4.25
7x14x7	2.50	2.95	4.50
7x18x7	2.75	3.15	4.95
7x21x7	2.85	3.25	5.25
7x24x7	3.25	3.75	5.50
7x26x7	...	4.50	6.50

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7x14	1.10	1.25	1.95
7x18	1.45	1.65	2.25
7x21	1.70	1.95	2.75
7x24	1.95	2.25	3.25
7x26	2.50	2.75	3.75

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Simple Explanation of Radio for Everybody

Chapter IV, Part II—Inductances—Fixed and Variable

By M. W. Thompson

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

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

IN THE first part of this chapter we took up inductance coils as individual units. We will now see how they are combined to make other units for tuning Radio frequency currents.

Induction

The phenomenon of induction may be

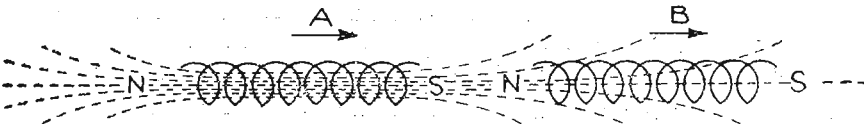


Figure 24—Induction transferring energy from A to B during one half of a cycle

said to be the transference of energy by electromagnetism from one circuit to another without a metallic connection between those circuits. Alternating, and rapidly varying direct current, may be transferred through induction by placing two coils, each in a different circuit, in close proximity to one another, but un-

directed by the arrow. Current flowing in a coil creates within it a magnetic field composed of lines of force similar to those around a horseshoe magnet, with which we are all familiar. For reasons unnecessary to go into here, the ends of a magnetic field are designated as the north pole and the south pole. In our drawing the lines of force are dotted, the letter N indicating the north pole and S the south pole. It will be seen that these lines extend through the coil B.

As the current in A builds up to maximum in the direction shown, the lines of force build up in strength. As the lines build up, they create in the turns of coil B a current similar to that in coil A and flowing in the same direction. As the current in A passes its maximum and begins to weaken before reversing itself, the lines of force weaken and the current in B lessens. The current in A reaches zero, the lines cease to exist and no current flows in B. The current in A now travels in the opposite direction, as shown in Figure 25, the N and S poles are reversed and, in coil B, a current is created flowing in

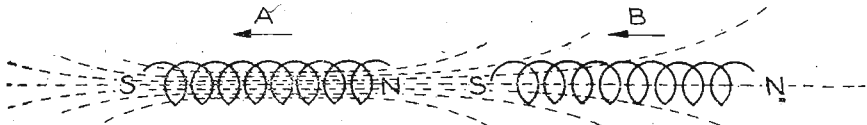


Figure 25—Induction transferring energy from A to B during second half of a cycle when current is reversed

varying direct current cannot be so transferred. In Radio receivers energy is passed from circuit to circuit in any of three ways: by induction, as explained above; by conduction, which means the connecting of both circuits to one coil, in which case it forms a part of each; or by capacity, to be discussed later.

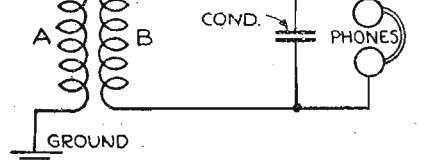


Figure 26—The use of a loose coupler to transfer signals from antenna-ground circuit to detector-phone circuit

The action which takes place during induction may be explained by referring to Figure 24. Coils A and B are in close proximity to each other; the turns of each are wound in the same direction, and in coil A a Radio frequency current is flowing. We will consider it at an instant when current is flowing in the direction in-

lost. If, then, coil B is placed within coil A, its field will be the same as that of coil A and much more energy will be passed. In Figure 27 we have one of the hook-ups used by amateurs and experimenters back

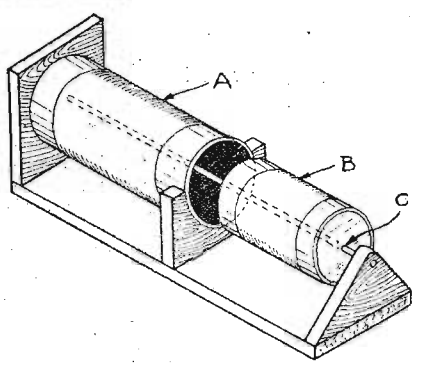


Figure 27—The loose coupler, 1906 predecessor of the variocoupler

in 1906 and 1907, and in Figure 27 is the instrument used to transfer energy from the antenna-ground circuit to the detector-phones circuit. This was known as a "loose coupler," and coil B could be moved in and out of coil A on the rod C. We speak of the proximity of two such coils as the "coupling," and refer to their being very close as "tight coupling" and their being several inches apart as "loose coupling." Since the unit shown in Figure 27 permitted one to vary the "looseness" of coupling, it received the name "loose coupler."

The old loose coupler had many mechanical drawbacks and has given place to the modern variocoupler. For instance, the problem of mounting a loose coupler behind a panel and varying the relationship of the coils from the front, taxed the inventive and constructing ability of many an amateur. Then, too, this unit took up too much space—the length of both coils plus 3 or 4 inches.

Coupling is not a matter of distance between coils only, but is also one of turns being parallel. Figure 28 is an end view of the modern variocoupler wherein one coil is placed within the other and so ar-

ranged that it may be rotated within the other coil. In the position shown, we have very tight or close coupling. If, now, the inner coil is rotated as shown in Figure 29, so that its turns are at right angles to those of the outer coils, the lines of force created in one do not cut the other coil longitudinally, but from side to side, and little energy is transferred.

Selectivity

The thought at once occurs, "But, if the most energy is passed with maximum coupling, why not keep it set at maximum?" Coupling is essential to selectivity or separation of stations. In Figure 30 the lower line covers the wave lengths 110 to 290, and the left-hand vertical line shows intensity or strength. Station X is transmitting on a wave length of 200 meters, but it can be seen that some of its

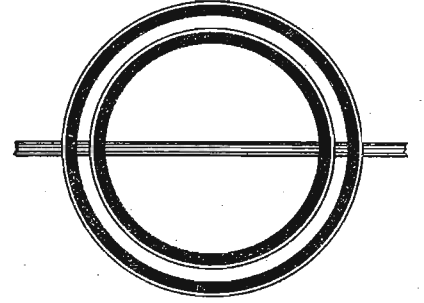


Figure 28—Two single-layer coils so placed that one may be revolved within the other

energy goes out on wave lengths from 120 to 270. Station Y is sending on 230 (Continued on page 20.)

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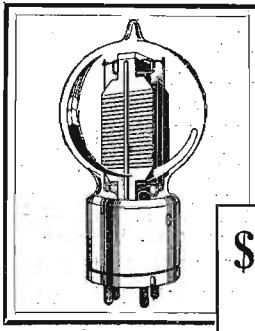


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Science Grabbed by All

Everybody Talks in Same Language—Radio

THE rush of Radio into everyday life is having its effect not only upon public habits and tastes, but upon the vocabulary of the average man.

A generation ago no one knew what a carburetor was, or differential, transmission, and a hundred and one other automobile terms which are now a part—often a large part—of the vocabulary of everybody.

The automobile proved that dictionaries, after all, are not made by scholars, but by the people themselves—the general public. When the automobile came in, with its vocabulary of new terms, the dictionary man had to follow suit or find himself hopelessly out of date. For years, theoretical electricity was the field only of the expert or of the scientist. Then along came Radio, and all its benefits, apparatus and new terms.

Today the Radiophan talks a language all his own. The small boy and the millionaire Radio bug, who make their own sets, now speak the same language—an entirely new one. A few years ago neither of them would have known a hook-up from a hole in the ground. Broadcasting? What in the world was that? High frequency currents? Nobody cared what a lot of electricians and crazy scientists were doing!

Yet today the language of the technical radiotrician has become the everyday language of most men. They talk as freely—and as understandingly—of amperes, ohms, capacity, resistance, inductance, modulation and amplification as they used to talk about the price of a suit of clothes, and the high cost of living. They know what these terms mean, too.

Country Newspapers Benefited

News Extras Become a Thing of the Past

SHORT flashes, used by metropolitan newspapers to build their scareheads by which they are supposed to sell their papers, may be somewhat limited in the future in the way of selling in country places. The small community paper will be able to cover all great items of news for their readers in the time to come by the use of Radio, cutting down measurably on the circulation of the metropolitan and enhancing greatly the prestige and power of the small weekly.

It is quite apparent that Radio will increase the value of all country weeklies in future years and that there is not the slightest danger of any financial harm coming to them from it.

The extras of the large city paper, built, perhaps, on a scant one hundred-word flash, will suffer immensely and perhaps disappear. Years ago we personally got out of the habit of rushing to the door and purchasing extras from the loud voiced newsboy, invariably to become disappointed by the abbreviated report contained therein and which usually had been shouted by the boy in an endeavor to sell his wares.

Country editors should welcome Radio as a friend and not an enemy in their competition with the metropolitan press.

Radio Literature

Circulars from Manufacturers Are of Value

UNLESS the industry to which the literature relates is of national scope and interest, it invariably finds its way to the waste paper basket. In the Radio industry it is different, however. First because Radio literature has national appeal, and secondly because of the fact that it may contain some valuable information that is of interest to the Radio fan or dealer.

When you receive a circular from a Radio firm, don't throw it away. Radio is a new industry, or, at least, comparatively new, and the very thing you throw away may be what you are looking for some future day. Manufacturers are a little ahead of us all the time. They send out circulars and literature of new parts and circuits that may not be in vogue for a few months later; yet it gives you an opportunity for looking forward and in some cases get the jump on the other fellow.

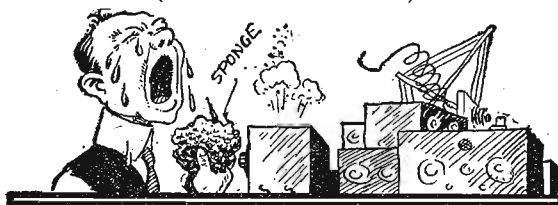
RADIO INDI-GEST

UXTRA! UXTRA! KINK MILOPLEX TO BE DIVULGED IN NEXT INDI-GEST

WALLA WALLA, February 31, (By Indi-Gest Broadcaster).—A great treat is to be given the whole wide world next week when Mr. Indi-Gest publishes for the first time a hitherto unpublished picture of the mysterious man who is reported to have invented the Miloplex, affectionately termed "Plexy" by those on intimate terms with it. The writer, who admits that he is, by the way, the best reporter and interviewer on the Isle of Walla Walla excepting Jack Dempsey, was informed by Mr. Indi-Gest that his only reason for reproducing this treasure was that he wanted to cut out all this mystery bunk that the King has been spreading around as thick as the plush on a bank president's private office rug. "It's a downright dirty trick for Milo to be spoofing the readers of my column this way," said Indi. "I intend," he continued, "to air the whole mystery, and aired it shall be. Run this picture next week." And so readers of Indi-Gest will have the edge on readers of Radio Digest if they turn to page 16 next issue. It is reported that the King isn't so much, really (Cat!).

The Rhyme of the Rabid Radiot

(Part Two: Conclusion.)



"And then I bought a Reinartz coil—
Take heed to what I'm telling—
But still quite fruitless was my toil,
And so I tried Flewellling.

"A nice condenser next was bought
With mica dielectric,
But still results remained at 0,
I grew quite apoplectic.

"At length I saw a hook-up by
A man named Hazeline.
I thought, 'Here's something new to try,'
And built a Neutrodyne.

"I hooked my set up carefully
To antenna and ground,
I lit the audions prayerfully—
But never heard a sound!

"Again I changed my parts around,
And opened wide the throttles—
At last! At last! I heard a sound!
Pop! Pop! Went two new bottles!"

He stopped to wipe away a tear.
I pitied him his fate.
"But wait, the worst you've yet to hear."
And he went on to state—

"I've tried each circuit that I know,
The super-heterodyne,
The 'Flivver' set, tuned Radio,
And all of them seem fine—

"I hunt each novel circuit out
Wherever it may lurk,
I try them all, without a doubt,
BUT NONE OF THEM WILL WORK!"

His voice had risen to a roar,
The last word was a scream!
* * * * *

I woke. Why, here I'm on the floor!
The old man? Just a dream!

ANN TENNA.

A-B-C Lessons for Indigest Beginners

Chapter XX—Radio Cures Insomnia!

BY GOSH

THIS for transmitter
That agitates the air,
And sends out bedtime stories
To folks most everywhere.

Yes, We Have No Objections

Indi-Gest, Chgo., Ill., Eastern Union (Collect).
Is it considered economical strategy for me to have my telephone taken out? And if so, why?

After the telephone company takes out my phone, and leaves the cut-in-wires dead-ended in my basement and the alley cable pole, would there be any objection to me hooking up to them for an aerial? If so, why not?

Would this give me the jazz with a Stebbins '24 with one farad capacity fixed condenser in series?

I will send the dollar, if I get a dollar's worth of information. Am saving up back numbers of Indi-Gest until I get enough to sell a dollar's worth to the junk man.

BAT DYKE.

Page Mr. Hall

Please Mr. Wendell Hall,
Of KYW call,
Is you posulutely shor'
Taint nev'r goin' rain no mor'?

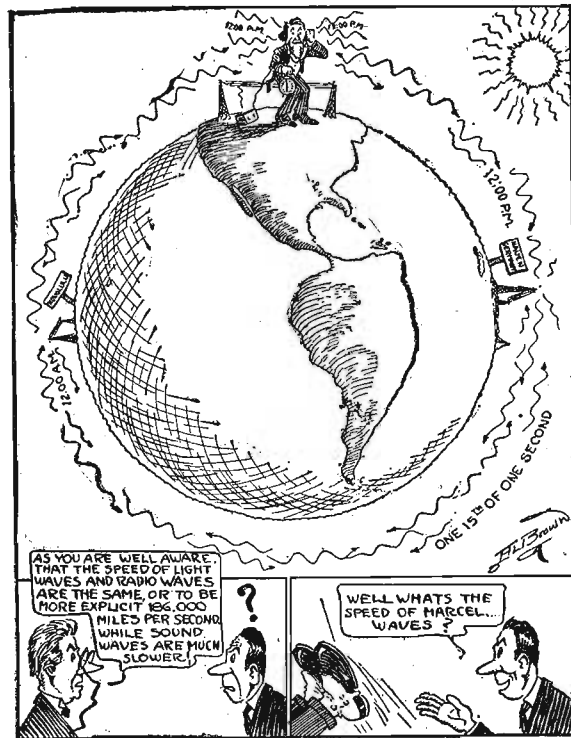
H. K. C.

Get a Tight One so You'll Choke

Dear Indi: At last! I have invented it!!! Guess what it is—a new way to eliminate static—y-e-s-S-i-r-e-e. I just connected my A battery leads from the ole set to an electric light socket and I ain't heard a bit of static since. I also save my A battery juice thus.

I tried to send you the 1 dollar bill but I can't send it on a postcard so I guess I will go to Troy and buy a collar with it.

BAY KLITE.



Condensed

By DIELECTRIC

The way those announcers gave the plays of the World Series, just as if you sat beside them, should make every baseball fan and Radiophan forever grateful. The disgust on Babe's face when he was permitted to move in a leisurely fashion to the first bag twice in one game could be "seen" through the set. Many of us considered tuning out this professional ball stuff because of some things which we are now ready to forget—until next season, at least. But when we heard the cheering and pictured "Bottle Legs" sliding for a plate—well, the excitement was too much. Think of following each play miles from the diamond! Only Radio makes it possible.

Radiotherapy! Every man his own broadcasting and receiving set. You don't get jazz except when some one of your vital organs is functioning poorly. A physician in Florida listens to your body broadcasting its program; decides your tubes are oscillating with tubercular frequency, and you, in Canada, "receive" a Radiotherapeutic treatment! The man who predicts certain limits to the use of Radio is likely to be jeered at the following day. If Radio will discover diseases and cure them, its day is marked as the greatest in all history. Keep your broadcaster in good shape, fellow fans, and eschew jazz.

When for any reason the wave length allotted a broadcasting station is such that it prevents perfect transmission, the government should grant permission to change it. KYW could not be heard with any degree of volume at distant points on the wave assigned to it—345. By permitting the station to change to 536 meters it was picked up with good volume by DX fans. It would be a pity to condemn this transmitting plant to a wave length effectually cutting off its usefulness. Thousands of music lovers are eagerly awaiting broadcasts of operatic performances by the Chicago company through the microphone of KYW.

No word from the Artic party, under the direction of Captain MacMillan, for a period of about three weeks caused some anxiety to those interested in the Radio experiments carried on during this trip to the Pole. Interference was anticipated because of the Aurora Borealis and atmospheric conditions generally. It is now assumed that communication with the Bowdoin may go on with certainty through the winter months. There are a goodly number of amateurs in this country who are watching the results of Radio transmission from this Artic ship.

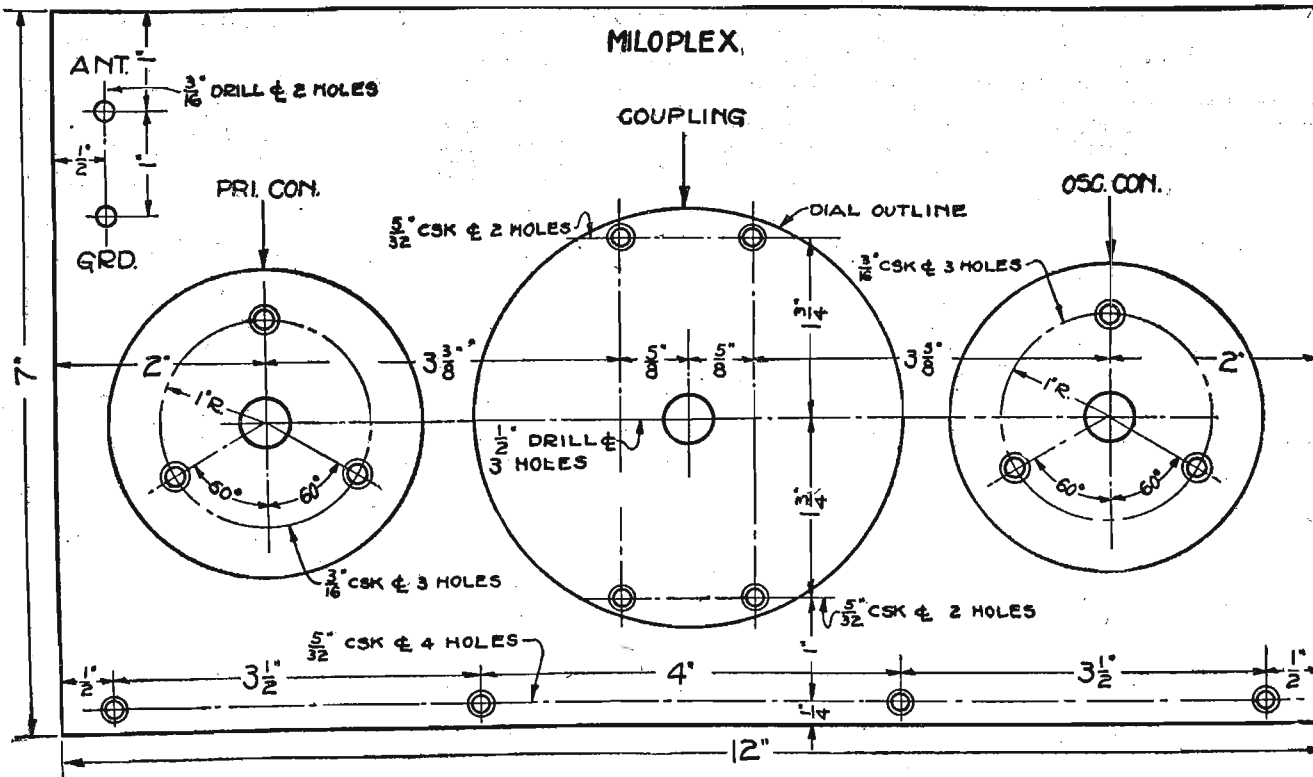
I see my old friend Mills, superintendent of police in the Quaker City, is awake to the worth of Radio as a means of assisting the minions of the law get some pleasure out of their work. It's slow business (I'm not slamming Philadelphia) walking a beat with no crime in it, or other diversion, so this worthy ex-soldier plans to entertain each cop by providing him with a portable receiving set. Of course, in addition to that he is supposed to listen to orders from headquarters. The plan to have an auxiliary force among trusted listeners in is admirable. I foresee an exodus of criminals to New York, Chicago and station KOP.

Just what make of set it will be no one knows—yet, but a "princely" one to be sure, for it is to be installed on the "R. P." ranch, Alberta, Canada. The Prince of Wales is said to be an ardent Radiophan, as are all the members of his family, receiving sets being a regular part of the furnishing in each Royal household. This young chap came to America to escape some of the arduous duties attendant upon his titled rank, and with a good Radio set he can listen to most anything desired, wearing what he pleases while doing so.

How to Build a Three-Tube Miloplex Receiver

Panel Layouts and List of Parts

By H. J. Marx



IN THE construction of the three-tube Miloplex circuit, it is essential to keep in mind certain factors. Practically any very selective receiving set is likely to have body capacity effects. Likewise, close proximity of the audio frequency

stages to the tuning units not only may increase this trouble but very often affects the receiving efficiency of that tuning unit.

possible. This distance is usually determined by the length of the rotor shafts and the dials fastened to these shafts. By this method all body capacity effects have been entirely eliminated.

The three elements mentioned were then assembled on the one panel and all the remainder placed in the second unit. In addition, by using spacers in mounting, not only the condensers but also the variometer were kept as far from the panel as

- ### LIST OF PARTS
- 1 Variometer.
 - 2 Variable Condensers .0005 mfd.
 - 3 Dials.
 - 1 Fixed Condenser .005 mfd.
 - 1 Fixed Condenser .002 mfd.
 - 1 Fixed Condenser .00025 mfd.
 - 2 Fixed Condensers .0015 mfd.
 - 1 Fixed Condenser .0025 mfd.
 - 1 Fixed Condenser .0001 mfd.
 - 9 Binding Posts.
 - 8 Single Connection Jacks.
 - 2 Panels 7x12".
 - 3 Pieces Panel Stock 1/8x1 1/2x4 1/8".
 - 2 Brass Angles.
 - 3 Rheostats, 20-ohm.
 - 1 Potentiometer, 1,850 ohms.
 - 1 Variable Grid Leak.
 - 2 Double Circuit Jacks.
 - 1 Single Open Circuit Jack.
 - 2 Audio Frequency Transformers.
 - 3 Standard Tube Sockets.
 - 3 Vernier Adjusters.
 - 2 Baseboards, 1/2x7 1/2x12".

Although shielding helps to eliminate body capacity effects, yet it does not do

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Mercury.....7.50

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Western Electric.....8.25
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TRANSFORMERS
All American (all ratios).....\$4.25
Erla Reflex.....3.95
A-me.....3.75

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7x18.....2.95
7x24.....3.45
Hydrometer.....\$3.35
Sockets......30
Bus bar length......03
Dials, 3"......45

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A-401-A (Type UV-201-A)	EACH
A-12 (Type WD-12)	

All the above Tubes guaranteed amplifiers and detectors. Shipped C. O. D., postage prepaid.

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Selection of Apparatus
The selection of proper apparatus is so important that enough emphasis cannot be laid on it, even to the extent of repetition. Many a 5 and 10-cent store set may have given good results when conditions were

favorable, but present day fans demand satisfactory operation under all sorts of unfavorable conditions. In order to obtain this, he must have the highest quality of apparatus and the greatest efficiency in operation. So many people claim that "they would rather pay a little more and get the best," yet like the proverbial bargain hunting woman they will spend twice as much in fare and time in order to fight at a sale where they save a few pennies. Too many sets have been brought to the writer's attention where the source of all trouble was obvious.

Variometers
The first and undoubtedly the most important piece of apparatus in this circuit (Continued on page 18)

MISSING WHAT YOU GET

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

Full resistance 30 Ohms, adjusted to ALL TUBES. "Avoid the use of inferior powdered carbon rheostats."

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RADIO AT N.Y. PRICES

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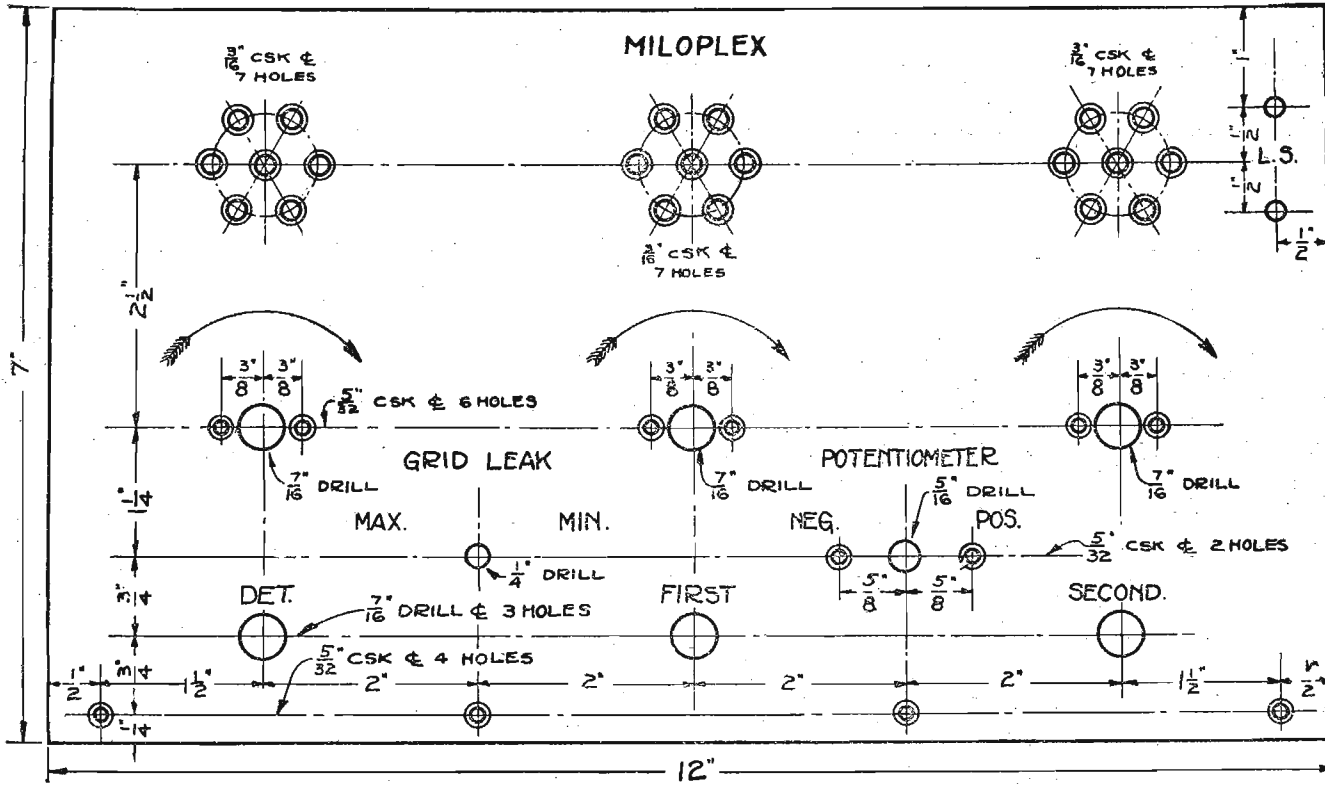
BUILD YOUR OWN RADIO SET

<h3>Cockaday Circuit, Complete</h3> <p>CONSISTING OF</p> <ul style="list-style-type: none"> 1 Cockaday coil and 7 pigtail connections 2 .0005 variable condensers 1 socket 1 panel, 7x18 2 dials, 3-inch 1 grid leak and condenser 1 rheostat 1 switch lever 1 base board 12 feet bus bar 2 switch points 7 marked binding posts 1 Jack Wiring diagram and instructions <p>Cat. K 178 \$13.65</p>	<h3>Reinartz Circuit, Complete</h3> <p>CONSISTING OF</p> <ul style="list-style-type: none"> 1 Reinartz coil and 16 pigtail connections 2 3-inch dials 1 .0005 variable condenser 1 11-plate condenser 1 socket 1 rheostat 3 switch levers 1 7x14 panel 1 base board 8 marked binding posts 12 feet bus bar 1 grid condenser 2 dozen switch points and stops Wiring diagram and instructions <p>Cat. K 179 \$10.85</p>		
<h3>Flewelling Circuit, Complete</h3> <p>CONSISTING OF</p> <ul style="list-style-type: none"> 1 .0005 variable condenser 3 .006 mica condensers 1 7x12 panel 2 coil honeycomb mount 1 variable grid leak and condenser 1 50 turn honeycomb coil 1 75 turn honeycomb coil 2 coil mounts with straps 1 dial, 3-inch 8 marked binding posts 1 base board Wiring diagram and instructions <p>Cat. K 180 \$12.45</p>	<h3>Ultra Audion Circuit, Complete</h3> <p>CONSISTING OF</p> <ul style="list-style-type: none"> 1 7x12 panel 1 .0005 variable condenser 1 socket 1 variometer 1 vernier rheostat 1 grid leak 1 .0002 mica condenser 7 binding posts 1 base board 10 feet bus wire Diagrams and instructions <p>Cat. K 181 \$9.65</p>		
<h3>Dietzen Vernier Condenser</h3> <p>14 Plate \$2.65 24 Plate \$2.95 46 Plate \$3.45</p>	<h3>DIETZEN Midget Tube</h3> <p>1 1/2 Volt, Operates on one dry cell, either with or without B battery. Wiring diagram Free with each tube.</p> <p>Socket 40c \$1.00</p>	<h3>A.B.C. "B" Battery</h3> <p>22 1/2 V. Small.....\$.95 Medium...1.45 Large...1.95 45 V. Small...1.95 Medium...2.50 Large...3.50 1 1/2 volt twin double duty "A" battery .75</p> <p>\$1.00</p>	<h3>Loop Aerial</h3> <p>Set up in 5 minutes. All parts complete</p>

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THREE-TUBE MILOPLEX
(Continued from page 17)

is the variometer. There are three points in variometer construction that must be remembered: low resistance in windings, low internal capacity and proper inductance values. A well made wooden variometer might have a low capacity value, but unfortunately the reason most manufacturers use wood is its cheapness, and thus they defeat their own ends. Coatings of cheap shellac and varnish and poor rotor bearings place most variometers of this sort absolutely out of consideration.

Moulded variometers are exceptionally popular. Their internal capacity, however, is not as low as can be attained in other types, but because of their other numerous good points of construction, design and efficiency, they are normally very satisfactory.

For low internal capacity, the winding should be of the self-supporting type, sometimes in single-layer form, or like a few at present on the market, of the lattice-wound type. The windings may be attached to the frame work in various ways, so as to avoid the tendency of the frame to act as a dielectric and thus creating capacity effects. Self-supporting windings are often covered with some kind of shellac or cellulose solution to act as an adhesive, thus retaining the wires in proper shape. If too much of this is put on, the capacity effect becomes excessive.

For low resistance it is merely necessary to see that the gauge of wire used is heavy enough. Sometimes it is difficult to put on a sufficient number of turns in the space reserved for it, so the manufacturer resorts to finer gauge wire. This creates additional resistance and is detrimental to finer tuning. The wire used preferably should be 20 gauge or larger.

Where a variometer is used in the grid circuit in conjunction with the rotor of a variocoupler, the number of turns required in the variometer winding need not be high. In a circuit of the Miloplex type, in order to cover the present wide wave length range, about 60 turns on the stator and rotor each will be required. When used in conjunction with a .0005-mfd. variable condenser, this number of turns gives the best induction value for operation.

Condensers
Much has been said and still remains to be said about variable condensers. Space is lacking for a thorough analysis of the subject. Rest assured, however, that a low priced condenser will never be a good one. Very thin plates bend too easily. Composition ends, unless of heavy stock, will warp in a short time and then the plates will touch. Metal bearings are required, or the wear will soon result in loose fit and short circuits.

For uniformity two .0005-mfd. condensers are used. A .00025-mfd. variable condenser across the rotor is all right too. The one in the antenna circuit may be

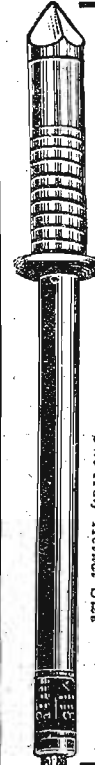
.001 mfd., so don't worry if you want to use the same parts you used before. But follow the substitution as stated. Vernier condensers can be used. In the set constructed, vernier adjusters on the dial were used.

Fixed condensers should be of the mica dielectric type. Single connection jacks were used for terminals from one unit to the other. Since 201-A tubes were used, 20-ohm rheostats are required. Contrary to the opinion of some, 1,850-ohm potentiometers are available, and manufacturers promise more on the market.

A good variable grid leak is necessary. There really are some available!

Get good audio frequency transformers; high ratios are unnecessary. Four or even five-to-one ratios are more than enough.

Don't ask for Radio frequency on this circuit yet. And it hasn't been developed for loop aerials so far. That may come later.



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Another Step Miloplex

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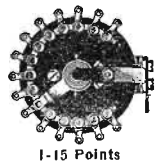
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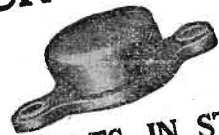
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1 Reinartz wound coil, 1 tube socket, 1 rheostat, 1 23-plate .0005 MFD. variable condenser, 1 13-plate .00025 MFD. variable condenser, 3 inductance switches, 23 switch points and nuts, 6 switch stops and nuts, 8 binding posts, 2 3" dials, 1 variable grid leak, 1 .002 MFD. phone condenser, 23 feet bus bar wire, 1 high-grade panel ALREADY DRILLED AS PER DIAGRAM
\$10.95
Two-Stage Audio Frequency Amplifier—Parts complete in every detail for this Circuit—\$11.00
Specify type of tubes you intend using

CONDENSERS

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13 Plate Variable; value, \$2.50	1.20
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23 Plate Variable; value, \$3.50	1.35
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EXTRA SPECIAL—Telephone 3000 Ohms Headsets; \$9.00 value; reduced to... 3.50

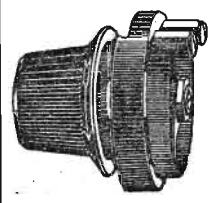
Vernier Dial Adjuster, List, 35c; special... .25

Honeycomb Coils, 50 turns mounted...\$.95
Honeycomb Coils, 75 turns mounted... 1.00
Double Coil Mountings... 2.45
Triple Coil Mountings... 3.35
Reinartz Coils, increased wave-length and mounting... 1.95

FLEWELLING CIRCUIT EVERY PART COMPLETE
2 honeycomb coils, 1 2-coil mounting, 2 coil plugs, 3 .006 condensers, 1 variable grid leak, 1 grid leak, 1 23-plate .0005 MFD. variable condenser, 1 Vernier rheostat, 1 tube socket, 8 binding posts, 20 feet bus bar wire, 1 3" dial and 1 high grade panel ALREADY DRILLED as per Diagram in Booklet of instruction sent free...
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Specify type of tubes you intend using

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MULTIPLE POINT INDUCTANCE SWITCH with Knob and Dial (15 Switch Points)...\$1.25
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Filament Rheostat, 20 ohm... .80
Filament Rheostat, 50 ohm... .90
With 2" Dial, 15c extra.
TELEPHONE PLUGS... .60
FRESHMAN VARIABLE RESISTANCE LEAK and MICA CONDENSER Combined... .75



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Audio Amplification for the Flewelling Set

Part II—Consideration of Tubes to Be Used for Best Results

By E. T. Flewelling

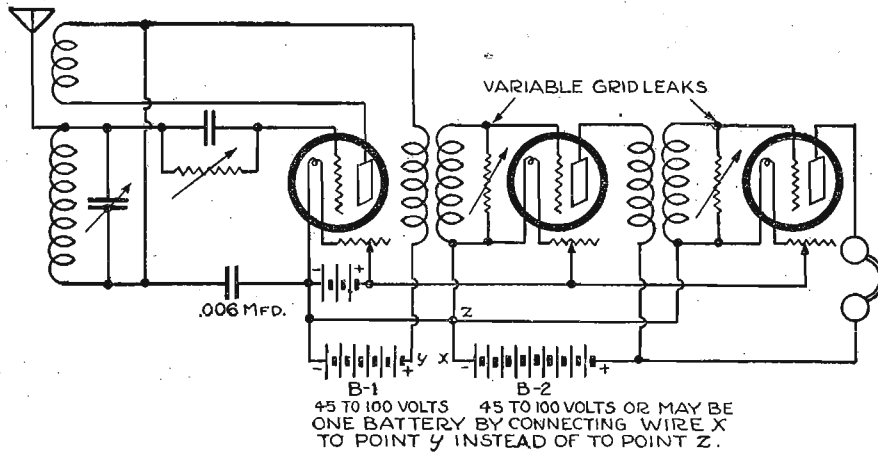
IN USING an amplifier on the Flewelling set, we must take into consideration the fact that this circuit is not a straight plain regenerative circuit, but is a super-circuit, which means that it has the characteristic super-whistle and that this whistle must be taken into consideration when we start to amplify the output of the circuit. Our mail shows us that perhaps 50 percent of the Flewelling sets in operation today are not operating as super-sets, but are operating as plain regenerative sets; this may be due either to the choice of their owners or to incorrect setting of the grid leak. Some of our most enthusiastic letters are from users of the set as a plain regenerator, and the reason for their remarkable success is one or two features that were incorporated in the layout of the set.

We hope in the near future to be able to write a few notes on the plain regenerator constructed along these lines, as we believe that they would be of vast interest to some of the fans. If the Flewelling circuit is used as a plain regenerator without any continuous whistle in it, then the wiring diagram in the amplifier will be as shown in Figure 1 and the recommended correct way of wiring will be after the type shown in the photographs, emphasizing that the construction shown in the latter will be almost as necessary to successful operation as the wiring diagram itself.

Tubes Used in Set

Regarding the tubes to be used we might consider them in the order of their size: first, the 199 tube. This tube will use from 45 to 100 volts on the plate and not more than 3 volts on the filament—under no circumstances more, for 3 1/4 volts means a new tube in a very short time, and for this reason a cheap voltmeter that will indicate at all times the filament voltage will be found to be a good investment. Also note that if you use a 199 tube with an adapter in a standard socket, you are just cutting down your results so much. The makers of this tube spaced the terminal plugs differently from the practice in older style tubes in order to cut down the capacity between the terminals. This is really an extremely important feature. It is of very great help and should not be neglected.

If you will look at the terminals in the average adapter, you will find that the work of the builders is undone when an adapter is used because of the closeness and the arrangement of the adapter terminals. Therefore, use a 199 tube with



a 199 socket only. This caution also applies to the WD-11 tube. Do not use an adapter with this tube. The WD-11 tube rarely uses over 45 to 60 volts on the plate end; of course, the usual 3/4 to 1 volt at the most on the filament. This also is true with WD-12 tube. Perhaps the best amplifying tube that we have is the UV201-A, often labeled C301-A. This tube, using 5 volts on the filament, will take up to 150 volts on the plate. As an amplifier, all around best results will be obtained at voltages running from 40, in the case of the one stage, to 60 for two stage, and upwards to 150 volts for the third stage. Excellent results may be obtained, however, with three stages using a maximum of 67 volts on the plate, if it is cared for. The UV-201 tube also is covered by this range.

Characteristics of Tubes

So far as the detector tube is concerned, we have, I believe, already fully outlined this in previous articles, but it might be of interest to know that we have secured best tonal qualities, quietness, etc., on our

ordinary plain regenerative sets through the use of hard tubes as detectors instead of the soft 200 tube. The 200 tube is undoubtedly the most sensitive detector that we have, but so many people overlook some of the essential things toward this sensitiveness that it might be well to speak of them here. The 200 tube is, as

a rule, extremely critical to plate voltage using in the neighborhood of 20 volts. If you have no means of accurately changing the plate voltage, you will immediately lose maximum sensitiveness from the tube. The 200 tube therefore will invariably call for the use of a potentiometer or some other fine voltage regulating device.

The difference in sensitivity between the 200 and 201 tubes, which latter is the writer's preference, is not sufficient to make it worth while to bother with a potentiometer, etc. Perhaps the greatest fault that we find with the 200 tube used before the amplifier is that the tube quite often has a hissing or rushing sound, which when amplified results in a very noisy reception. We believe that the use of a hard tube, UV-201, as a detector has enough advantages to far outweigh the extra sensitiveness of the 200 tube.

Set Used as a Super

If now you are using the Flewelling circuit as a super-circuit, with the whistle and all that that means, your problems will be a little more complex. In the first place, do not lay your plans for more than (Continued on page 20)

3000 mile

RADIO "B" BATTERY

DIRECT FROM FACTORY TO YOU
 SHIPPED PREPAID
 Greatest radio B battery on market. Absolutely fresh, full voltage, seamless cells, noiseless—will bring in Concerts **LOUDER** and **STRONGER!** Built correctly—full number of voltage taps—will work any tube or loud speaker. Real service **GUARANTEED.** Sold direct from our factories to you at lowest prices. Shipped prepaid to your door. **ORDER TODAY.** Send money order, check or pay C. O. D. Order By Number

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AYRES BATTERY CORPORATION, Cincinnati, Ohio

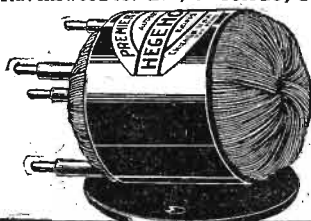
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Ratios 1 to 3, 1 to 4 and 1 to 5.....\$3.50
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All the above tubes are fitted with standard base, same as WD-12.

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UV-199.....\$3.50	C-299.....\$3.50	
UV-200..... 2.75	C-300..... 2.75	
UV-201..... 3.00	C-301..... 3.00	
UV-201A..... 3.50	C-301A..... 3.50	
WD-11..... 3.50	WD-12..... 3.50	
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Two Coil Honeycomb mount adjustable with knobs..... 4.00	2.55	Switch Points and Nuts.....	.80
50 Turn Honeycomb Coil..... 1.54	1.00	Six Switch Stop Points and Nuts.....	.40
75 Turn Honeycomb Coil..... 1.54	1.00	Freshman Grid Leak and Condenser.....	1.00
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Complete Instructions for Assembly and Wiring..... .50	.50	One Single Jack.....	1.00
Regular Price.....\$21.63		Blue Prints with complete instructions for assembly and mounting.....	.50
		Regular Price.....\$19.05	

OUR PRICE \$13.20 **OUR PRICE \$11.05**

All the necessary screws, nuts and miscellaneous small parts which are necessary to complete the set are included in the above prices. Any part in either of these circuits may be purchased independently at the advertised cut prices.

LOUD SPEAKERS		CONDENSERS	
List Price	Our Price	List Price	Our Price
\$181.00 Western Electric 10-A.....	\$125.75	\$30.00 Music Master.....	\$24.50
35.00 Western Electric 10-D.....	44.00	25.00 Atlas Amplitone.....	19.50
60.00 Magnavox Type R-3.....	51.00	25.00 Trinity Type A-f.....	19.50
35.00 Magnavox Type R-2.....	29.50	22.50 Belcanto.....	18.00
		28.50 Dictogrand.....	23.50

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List Price	Our Price	List Price	Our Price
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3.00 N&K GERMAN.....	5.75	5.00 CUNNINGHAM C. 300.....	3.95
7.00 FEDERAL.....	5.50	6.50 RADIOTRON U. V. 201-A.....	5.75
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HANES-ZENER CO., 3 West 29th Street, New York City
 The RADIO MAIL ORDER HOUSE—Known for Low Prices

RADIO FOR EVERYBODY

(Continued from page 15)

meters, but there is also energy on all the wave lengths between 140 and 290. In our antenna circuit, then, there are two sets of signals flowing, and even though we "tune" that circuit so that it responds

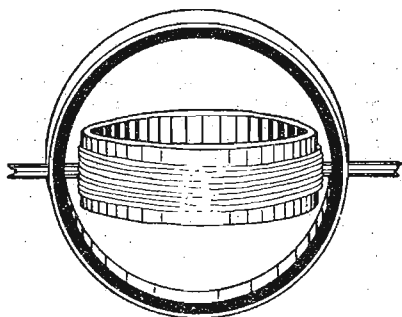


Figure 29—The variocoupler or variometer with rotor turned 90 degrees

to one more readily than to the other, both are present. Let us refer again to Figure 26. Both signals are present in coil A, one with a peak wave length of 200 meters, the other with a peak at 230 meters. The threshold value of our detector (as explained in a previous chapter) is 3. If

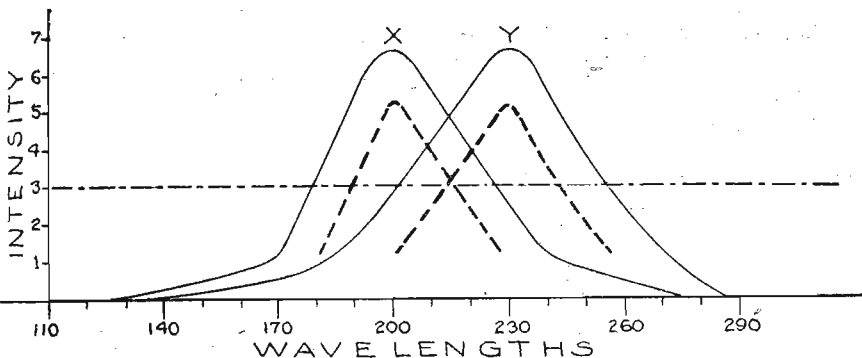


Figure 30—The resonance curves of two stations transmitting, supposedly, on 200 and 230 meters

we insert a means of varying the circuit containing coil B, we will hear station X when B circuit is responsive to wave lengths between 180 meters and 230 meters. We will hear station Y when it is responsive to wave lengths between 200 meters and 250 meters.

The resonance curves for stations X and Y, as shown in Figure 30, overlap above the threshold value of 3, and as Y can be heard also when our B circuit is set for the 200 meter peak of X, there will be interference. If we reduce the coupling between coils A and B so that the peak intensity of either station is only 5½ instead of 6½, the two curves cross below the threshold value of 3 and neither station will interfere with the other.

Some signal strength must be sacrificed to gain selectivity. Even though we may adjust our circuits to respond best to the one wave length, the loosening of the coupling is necessary to separate two stations of equal power and equally distant, or to hear one station that is far away through the signals of one close at hand. negative voltage on the grid that the tube

(TO BE CONTINUED.)

Base of an Old Tube Makes a Good Adapter

Procure the base of an old tube, one that will fit the desired socket. Heat the base and remove it from the bulb. Melt the solder on the prongs and remove the bulb. Solder four pieces of number 22 wire to the prongs. As soon as the solder is cool run the grid wire of the tube through the prong of the base of the old tube, but make sure that the grid matches the grid of the base, the plate to the plate of the base, and the filament to the plus and minus correctly. Cut the wire flush with the ends of the prongs and solder them in place. Fill in the space with sealing wax or paraffin.

AUDIO AMPLIFICATION

(Continued from page 19)

one stage of audio frequency amplification. The whistle is very apt to be amplified with the incoming signal and if it is, you will not care to have the phones anywhere near your ears while the set is in operation, even with one stage. This whistle is caused by a very rapidly fluctuating voltage of quite high value, and if it is carried from the set to an amplifier, will result quite often in paralyzing the amplifier tube by placing such a high

will be blocked. Means must, therefore, be taken to stop this variation frequency voltage from reaching the amplifier tube. There are several methods of doing this and the writer has not as yet been able to decide which method he prefers. For that reason, we are showing several diagrams of the various arrangements of filters that have been tried. Perhaps better results have been obtained by the use of high-resistance and by-pass condensers

15c Lettered binding posts, complete, set eight, 60c; two sets, \$1.00. Prepaid, same day. Stamps accepted. Everything in Radio. Ask for quotations. List for stamp. Kladag Radio Laboratories, Kent, Ohio.

You Don't Need Tubes

to get out of town. If you want new stations on your crystal set WRITE ME TODAY. Mine works 400 to 1,000 miles without tubes or batteries! Thousands have bought my plans and now get results like mine. CHANGES OFTEN COST LESS THAN A DOLLAR. Send self-addressed envelope for further information. Leon Lambert, 501 South Volusia, Wichita, Kansas.

than by any filter arrangement. The writer personally has had very good results with the diagram that was originally published for The Digest in which ordinary grid leaks across the amplifier terminals were adjusted to the point of best reception. This is the diagram shown on page 19.

Amplifying the Flewelling circuit as a super is well worth the trouble but it is something that calls for very patient and painstaking care, and you may rest assured that your troubles will be for nothing if the set is not built along the lines spoken of in our previous article, that is, very compact, with extremely short leads and no extraneous wiring.

Short Leads in Set

This matter of short leads with a minimum amount of wiring is of such importance that it has been made the subject of patent application in the belief that it might be even further developed in the near future. If you will refer to the photographs in the previous issue of The Digest, you will see how this scheme has been carried out. One is apt to get the impression from such views that there would be great danger of "interactions" due to the closeness together of the parts. Really, it does not work out that way because all parts capable of causing such troubles are a sufficient distance apart.

The ideal conditions for the arrangement of an amplifier are very well met in

this type of construction; that is, extremely short, direct leads for the grid and plate circuits; the return leads and filament circuit leads bunched close together, and the long drawn out layout of the parts rather than a bunched up layout in which all kinds of things might be happening.

I believe that we have covered the amplifier subject for all types of the Flivver circuit except that when it is used as a straight super-circuit, and because this calls for a consideration of so-called filter circuits, we will take it up in our next article.

(TO BE CONTINUED.)

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- Murdock 3000 ohm Phones..... 2.95
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30 Ohm Rheostats Complete with dial.... .59	2½"25	Jacks Double Circuit39
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Metal Top Socket Black moulded base... .39	4"39	Phone Condensers Necessary for sets, all. .10
3 Plate Condenser For vernier use..... .69	Crebe Type Dials Moulded 3"35	Grid Condensers Good construction..... .10
23 Plate Condenser Wonderful value..... .98	We Ship C. O. D. Just jot down what you want. We will ship it C. O. D. and pay the postage besides. No deposit required. Write for Our Catalogue.	Duo-Lateral Coils No. 2529
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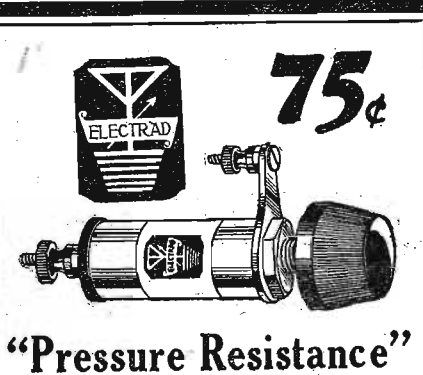


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Inside Mounting for Honeycomb Coils

Positive and Vernier Adjustment with Knob

The illustration shows a very unusual way to mount honeycomb coils for placing them on the inside of the cabinet, yet providing a means of operation with a vernier adjustment. A study of the sketch will

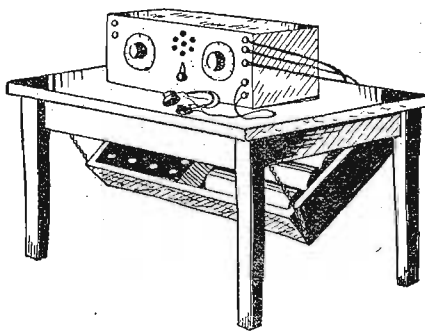
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THERE are many little kinks worked out at home that would aid your fellow Radio worker if only he knew about them. There are new hook-ups, new ways of making parts and various unique ways of operating sets that are discovered every day. Radio Digest is very much interested in obtaining such material. Send them in with full details, including stamped envelope, so rejected copy may be returned. The work must be entirely original, not copied. RADIO KINKS DEPARTMENT, Radio Digest, 123 W. Madison St., Chicago

show that when the dial is rotated clockwise, or the top to the right, both coils will move away from each other. When the dial is turned in the opposite direction the brass spring draws them together. The coils are held rigidly in place at all times and cannot be jarred out of place, and they are inside of the cabinet.—J. C. Carlisle, Van Wert, O.

Battery Box Attached to Table

Desiring to improve the appearance of my Radio table so that the B battery and A battery dry cells would be out of sight



and yet accessible, so that any desired adjustments could be made conveniently, I procured a shallow box, its depth slightly less than the width of apron of the table and attached it to the table as follows: One side of the box was fastened at the bottom to the apron with two small hinges, the opposite side being hooked to the bottom of the table top. A chain at

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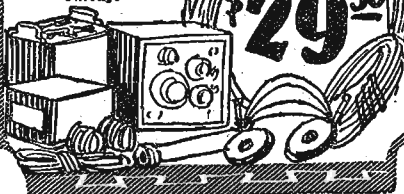
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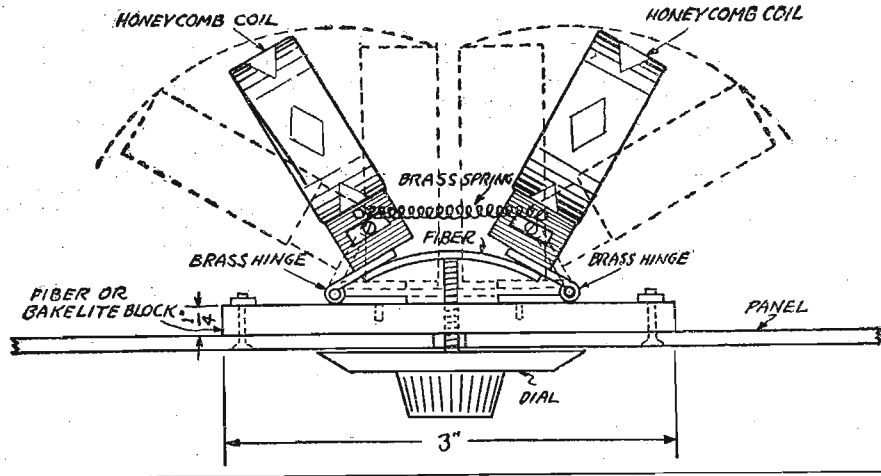
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COILS SWING ON BRASS HINGES



each side of the box allowed it to swing about halfway down, in which position battery adjustments can be made easily. The battery connections from the set were run behind the table and through holes in the bottom of the battery box, at the back. When hooked up underneath the table the box is entirely hidden from view by the apron.—O. R. Isaacson, Chicago, Ill.

Battery Markings

The markings on the primary side of both Radio and audio-frequency transformers are usually P, indicating a connection to the plate of the tube, and B, indicating a connection to the positive

side of the B battery. The secondary posts are marked G, which is connected to the grid of the amplifying tube, and F, connected to the negative filament of the amplifying tube.

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This device is especially built for use as a tuning instrument. Its construction is such that it will withstand unusual usage. Fully guaranteed. Absolutely no pencil markings.

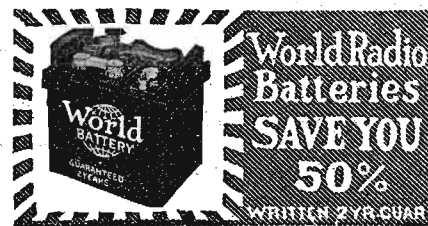
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Rubber Composition Is Good Coil Cement

It is not considered good practice to put shellac on a coil, as it produces a capacity effect. A very cheap and efficient method of covering a coil is to use tube cement. This can be bought at a bicycle shop or garage. Thin it down some with gasoline and apply the cement to the coil with a brush. Place the coil in a warm place until it dries. The cement is a rubber gum composition and is a good dielectric as well as a glue.—John G. Spangler, Lincoln, Neb.

The surface of crystals can be cleaned with carbon bisulphide.

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Rounded corner brass bracket, nickel plated. Spring German silver blades. Contact points of solid silver. Solder-flux compound on crow-foot offset of blades. Ready for quick connecting.

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.00025	.35	.0035	.70
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.00035	.35	.006	.75
.0005	.35	.007	1.00
.0006	.40	.008	1.00
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.0015	.40	.02	2.00
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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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The B-Metal Type C Fixed Detector for Your Reflex Set— Try One and Know

The price is reasonable when you see what it does. Thousands in use. Read one of the many reports.

\$2.50 B-Metal Refining Co., Elgin, Ill., May 27th, 1923. Gentlemen:—The crystal and type "C" Reflex detector received and tested out and we find that they are superior to any we have used so far. Hoping to be able to place a larger order in the near future, I remain, Very truly yours,
H. W. PEARSALL, 240 N. Worth Street.

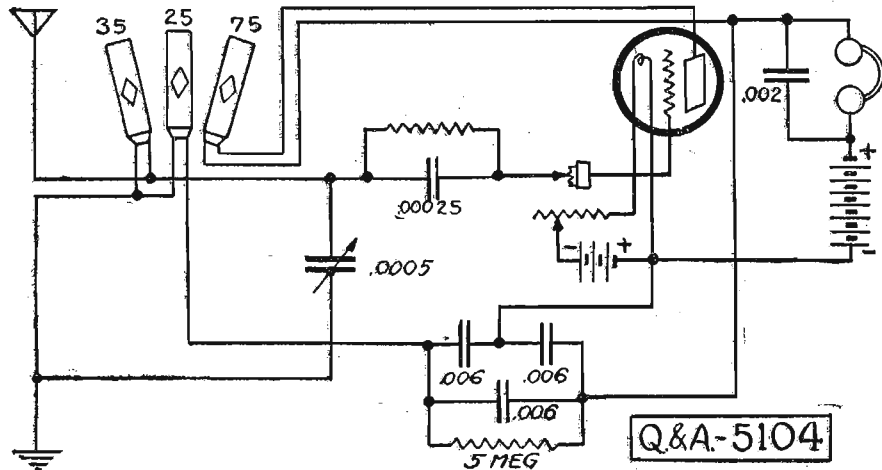
B-METAL REFINING COMPANY
3134 Trumbull Avenue, Detroit, Mich.
Chicago Branch, 53 West Jackson Blvd.
For Sale by All Dealers

Questions and Answers

Modified Flewelling

(5104) RD, St. Louis, Mo.
The hook-up shown is a modified Flewelling. I would like an explanation of the action with the third coil as shown. This receiver is consistently bringing in stations up to 1,500 miles with a constant

of audio frequency. I am using All American transformers and Freshman grid condenser and leak, also 43 plate condenser in aerial and 23 plate condenser in secondary. We have good results with the exception that at times the tubes with any rheostat adjustment seem to get dim



temperature of 90°. There is volume enough with one step to operate a loud speaker. The speaker consists of 1 pair W. E. phones and an aluminum horn.

The effect of this added coil is peculiar, inasmuch as after you have tuned in your station to maximum loudness, by slightly moving the center coil to one side or the other, the volume is almost doubled and any interference you may have been experiencing is gone.

What I can't understand is the coil windings must run in the opposite direction; not only the connections must be changed but the whole coil must be turned, or the tube will not oscillate, but when it does, with 110 volts on detector and one-step amplification, it can be heard over a block away on local stations KSD and WEB.

I happened on this accidentally while experimenting.

A.—We are pleased to note the splendid results accomplished with your original modification of Flewelling circuit. However, without a personal observation and experimentation we are unable to determine the exact action taking place through the additional coil. We are pleased to pass your findings on for experimentation. Circuit is shown in illustration.

Reflex Efficiency

(4752) LCS, So. Pekin, Ill.
I have an Armstrong circuit using 1 variocoupler and 2 variometers, 2 stages

Cockaday Coil Set \$2.50

Including full size blue prints of panel layout, complete picture hookup, and fully illustrated instructions for construction and operation. Coils are fully assembled, made exactly as specified by Mr. Cockaday, D coil bank wound. Far more efficient than any home made coils.

Standard parts for this sensational circuit—panel, coils, condensers, variometers, variable resistance, variable rheostat, socket, double jack, dials, switch, contact points, posts, busbar wire, spaggetti, etc. (no tubes or phones).

Complete for \$11.65

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HELENA, MONTANA

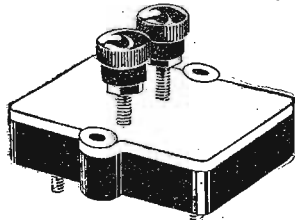
and then bright or vice versa; you can see them get dimmer and brighter. The tubes are U.V.-201-A's using 25-ohm rheostats. The trouble does not occur at all times; it seems to take spells. You won't notice it for probably a week or more; then it will start again.

Can you tell me where the trouble lies and what is causing it? Which circuit do you consider the best and most efficient, the four tube "Grimes Inverse" Duplex, R. F. Circuit or the Four Tube Portable Reflex in your issue of June 30?

Would you be able to publish this Grimes four tube Inverse Duplex Circuit? If not, where would I be able to obtain it?

A.—The condition you mention is caused by a poor connection in the A battery lead, possibly in the socket or rheostat, or it may be in some quite unexpected place. A review of the circuit will determine its location.

A Precious Instrument for Local and Long Distance Tuning
2 IN 1 VARIABLE GRID CONTROL . . . \$2.00
Worth \$10.00 for its efficiency



Patent Applied For

Micrometer adjustment as fine as 1/10,000 of an inch. Consisting of a variable resistance leak from 1/75 to 1/2 megohms and a variable condenser from .00002 to .0005. Shleided against all body capacity. Has no equal. The variable condenser is especially designed for use in the grid circuit with a minimum of losses and micrometer adjustment. The variable resistance is of special design, different from all others in principal operation and construction. The combined unit has no sliding contacts to wear out, therefore insuring long life.

At all high class dealers
Manufactured and guaranteed by

2 IN 1 RADIO & ELECTRIC CO.
Mohawk Building, New York

It is likely that of the two circuits cited you will find the portable Reflex the most effective and simple of operation.

A diagram of the Grimes Duplex appeared in the March 24 issue, page 13, of Radio Digest.

Reinartz Questions

(4726) EH, Southwest City, Mo.

I have constructed a set, using the Reinartz circuit. I use one WD-12; instead of the spider web I use a loose coupler with 30 turns on stator tapped every turn for the first ten turns. I can't get anything over it but a frying noise; it is not close to any power line. How can I tune this set? I have about an 80-foot aerial. Is this all right? Does the B battery need to be variable? The grid condenser is a .00025 mfd. and the grid leak is a variable pencil mark type. Is this all right?

A.—We are unable to give a definite reply without a diagram of the hook-up used.

We suggest that an antenna longer than that of your description, up to 150 ft. including lead-in, will afford better long range reception.

The fixed type of B battery is just as effective on the type of tube used as the variable.

The grid leak and condenser as specified are correct.

A more detailed description and diagram of circuit will probably enable us to assist you.

Four Circuit Tuner

(5138) JAS, Friars Point, Miss.

A few weeks ago I built the four circuit tuner, and used parts as recommended with the exception of variable condensers, which are of good quality, and of the same capacity (.00035).

The set works fine, but try as I may, it will not tune higher than 500 meters. The aerial is about 115 feet long. It is impossible for me to use a longer aerial. Is it, do you suppose, that the con-

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PRIMARY
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At your dealer or postpaid on receipt of purchase price. Write for leaflet.

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

densers are of the wrong capacity, though they were labeled .00035, as they should have been?

Would a 22 plate condenser of .005 allow me to tune to 600 meters?

What I want you to tell me is how will I make it tune to 600 without lengthening aerial or using a load coil, which seems to kill my signal strength.

A.—Answering your inquiry we are advising that limitation experienced in operation is due to low capacity of condenser employed. By substituting a 23 for 17 plate variable condenser you can tune to 600 meters' wave length.

England now has six broadcasting stations.

Worksman Radio Service

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\$3.50 Workrite 180° Silk Wound \$2.95
3.00 Mills 180° Silk Wound 1.95
8.50 Fisher, Large, 90° 2.25
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8.50 Remler, Moulded 4.45
8.50 Fisher, Large 2.65

CONDENSERS

\$2.00 R. C. 11 plate \$1.05
2.35 R. C. 23 plate 1.35
2.75 R. C. 43 plate 1.65

VERNIER CONDENSERS

\$4.00 R. C. 23 pl. \$2.25
5.00 R. C. 43 pl. 2.95

SOCKETS

\$1.00 Magnus, Aluminum \$0.45
.75 Bakelite45
1.00 Bell Panel Mounting Socket75

PHONES

\$8.00 Brandes Superior \$5.25
12.00 N. & K., Imported 5.50
5.00 Nerco 2.50
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Complete Parts for Cockaday Sets

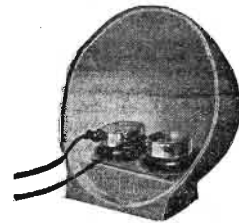
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Nath.
Baldwin
Head Set
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Results



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

Loud Speaker with phones . . . \$15.00
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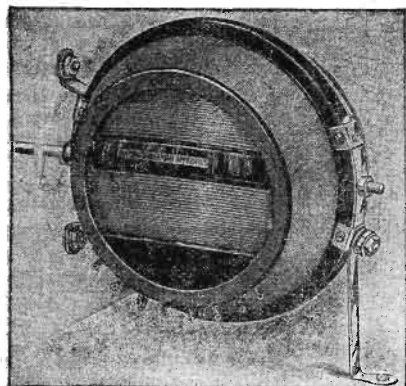
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Langbein & Kaufman Variometers and Variocouplers \$6 ea.
Finest instruments in the world.

Myers Hi-Mu Tubes \$4.35
Amperite-Automatic Filament, eliminates Rheostat Unmounted, 70¢; mounted, \$1.10

All merchandise absolutely guaranteed. Shipped immediately on receipt of purchase 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	
Alabama: Auburn, WMAV Birmingham, WBSY Mobile, WVEA Montgomery, WKAN	Idaho: Boise, KFAU, KFDD, KPFE Kellogg, KPEY Moscow, KPAN	Franklin, KY: Franklin, KFDD, KPFE New Orleans, WAAB, WAAC, WCAZ, WGV, WIAF, WTAF, WTL Shreveport, KFDX, KFHF, WGAQ	Pittsburgh, PA: Pittsburgh, KFIV Tucumseh, WTAU University Place, WCAJ Utica, KFGV York, KFDB	Chickasha, OK: Chickasha, KFGD Oklahoma City, KFJF, WKY Norman, WNAO Okmulgee, WPAC Tulsa, WGAZ, WLAL	Utah: Ogden, KFOP Salt Lake City, KDYL, KZN	
Arizona: Phoenix, KDW, KFAD, KFBC Tucson, KFDH	Illinois: Belvidere, WOAG, WTAH Cambridge, WTAP Carthage, WCAZ, WTAD Chicago, KYW, WAAP, WDAP, WCAZ, WMAQ, WPAQ, WSAU, WSAX Decatur, WBAO, WHAP Elgin, WTAS Lake Forest, WABA Matteson, WQAL, WTAN McLeansboro, WBRAS Mt. Vernon, WBAF Oak Park, WTAY Peoria, WJAN, WQAX Rockford, WIAB Sterling, WBBC Streator, WTAX Tascola, WJAZ Urbana, WIRM Zion, WCBQ	Maine: Bangor, WABI Houlton, WJAN Portland, WTAJ	Nevada: Reno, KDZK Sparks, KFER	Oregon: Astoria, KFJH Arlington, KFGL Baker, KFPA Corvallis, KFDD Hillsboro, KFFB Hood River, KFHB, KQP Medford, KFAY Pendleton, KFFE Portland, KDYQ, KFEC, KFIF, KGG, KGN, KGW Salem, KFCD	Vermont: Bellows Falls, WLAK Burlington, WCAZ Springfield, WQAE	
Arkansas: Conway, KFKQ Fayetteville, KFDV Fort Smith, WGAR Little Rock, WCAV Pine Bluff, WOK	Indiana: Anderson, WABC Brookville, WSAJ Greencastle, WLAX Greentown, WJAK La Porte, WBAF Marion, WJAG Mishawaka, WQAO Muncie, WTAF South Bend, WABJ, WGAZ West Lafayette, WBAZ	Maryland: Baltimore, WCAO, WEAR, WKC, WNAV Frostburg, WPAQ	New Hampshire: Chesham, WSAU Laconia, WKAV	Washington: Aberdeen, KNT Bellingham, KDZR Everett, KFBL Lacey, KGY Nash Bay, KFHH Pullman, KFAB Seattle, KDZE, KDZT, KFBR, KFJH, KFJC, KHQ, KJB, KTW Spokane, KFIO, KFZ Tacoma, BEL, KFBG, KFJH, KGB, KMO Walla Walla, KFOP Wenatchee, KDZI, KZV Yakima, KFJH	Virginia: Arlington, NAA Blacksburg, WEAE Portress Monroe, WNAV Norfolk, WTAR Portsmouth, WQAO	
California: Bakersfield, KDZE Berkeley, KQL, KRE Del Monte, KLN El Monte, KUY Fresno, KMM Hollywood, KFAR Long Beach, KSS Los Angeles, KDZT, KFCL, KFL, KHJ, KJS, KNV, KNX, KUS, KWH Los Angeles, KFHQ Modesto, KND Oakland, KLS, KLN, KZM Richmond, KFCM Sacramento, KFBR San Diego, KDPT, KDYM, KFBC San Francisco, KFO, KUO San Jose, KQW San Luis Obispo, KFBE Santa Ana, KFAV Santa Barbara, KFJH Selma, KFJH Stanford Univ., KFCH Stockton, KJQ, KWG Venice, KFAV	Iowa: Ames, WOI Boone, KFGQ Burlington, WIAS, WLAT Cedar Falls, KFJH Cedar Rapids, WJAM, WKAA Centerville, WDAZ Davenport, WJAL, WOC Des Moines, KFJH Dexter, KFJH Fort Dodge, KFBR, KFJH, WEAR Gladbrook, KFJH Iowa City, WAAA Lamoni, KFJH Le Mars, KFJH, WIAU Marshalltown, KFJH Newton, WIAH Ottumwa, KFJH Sigourney, WOAD Sioux City, WEAU Waterloo, WHAC, WRAN	Massachusetts: Boston, WNAO, WTAC, WTAT Dartmouth, WJAF Fall River, WBAR, WTAB Lowell, WQAS Medford Hillside, WGI New Bedford, WDAU Springfield, WBZ Worcester, WABK, WDAZ	New Jersey: Atlantic City, WHAR Gloucester City, WBAX Moorestown, WBAF Newark, WAAA, WBS, WOR, WBAZ N. Plainfield, WEAM Ocean City, WJAD Paterson, WBAZ Trenton, WHAL, WOAX	Pennsylvania: Allentown, WCBZ, WSAW Altoona, WGAZ Easton, WMAP Erie, WDAV Greene City, WSAJ Harrisburg, WABZ, WBAK Johnstown, WTAC Lancaster, WDBC, WQAL McKeesport, WIK Parkersburg, WQAZ Philadelphia, WCAI, WDAZ, WFI, WGL, WIP, WNAE, WOO, WVAD Pittsburgh, KDKA, KQV, WCAE, WTAS Reading, WBBZ, WRAZ Scranton, WGAN, WRAZ State College, WPAZ Villanova, WCAM Wilkes-Barre, WBAX, WNAH	West Virginia: Clarksburg, WHAK	
Colorado: Boulder, KFAJ Colorado Springs, KFCK, KFFQ, KFKZ Denver, AAB, KDZQ, KFAP, KFEL, KPKH, KFLE, KLZ Greeley, KFJH, KFKA Greeley, KFJH Gunnison, KFHA Trinidad, KFBS, KPHY	Minnesota: Baudette, KFGY Hutchinson, WJAN Mankato, KFJH, KFEX WABD, WBAH, WCAS, WLAG, WRAH Moorhead, WPAU Northfield, WCAZ St. Cloud, WFAZ St. Paul, AV7, WAAH	Michigan: Berrien Springs, KFGZ Dearborn, WVI Detroit, KOP, WCX, WWJ East Lansing, WKAR Flint, WEAZ Kalamazoo, WOAP, WLAG Menominee, KFLB Saginaw, WABM	New Mexico: Roswell, KNJ State College, KOB	Rhode Island: Cranston, WKAP Eastwood, WEAG East Providence, WKAD Providence, WFAN, WJAR, WRAH, WSAZ, WTAG	Wisconsin: Beloit, WKAW Fond du Lac, KFJH Kenosha, WABN La Crosse, WABN Madison, WQAY, WHA Milwaukee, WAAK, WCAY, WHAL, WIAO Neenah, WJAL Oshkosh, WTAQ St. Croix Falls, WRAL Waupaca, WPAH	
Connecticut: Bridgeport, WRAX Hartford, WDAK New Haven, WPAJ Storrs, WABL Waterbury, WQAD	Missouri: Butler, WVAR Cameron, WPAQ Cape Girardeau, WSAB Carrollton, KFJH Columbia, WAAZ Independence, WPAQ Jefferson City, WOS Joplin, WIAH Kansas City, WDAF, WBB, WJAL, WQJ Marshall, WJAT Moberly, KFJH St. Joseph, KFJH St. Louis, KFJH, KFJH, KFJH, KSD, WCK, WEB, WEW, WMAZ, WRAO Springfield, WJAL, WKAS, WQAB Tarkio, WJAT Webster Grove, WOAL	Montana: Billings, KFCH Bozeman, KFDD Butte, KFAP, KFJH, KFJA Great Falls, KDYS Havre, KFJH Stevensville, KFJH	North Carolina: Asheville, WFAJ Charlotte, WBT Greensboro, WQAZ Raleigh, WLAC	South Carolina: Charleston, WNAO, WQAB Clemson College, WSAZ Greenville, WQAV	Wyoming: Cheyenne, KFJH Laramie, KFJH	
Delaware: Wilmington, WHAV, WOAT	Nebraska: Fremont, WQAE Grand Island, KFJA Hastings, KFJH Kearney, KFJH Lincoln, KFDD, WFAV, WJAB, WMAH Norfolk, WJAG Oak, KFJH Omaha, KFJH, KFJH, WAAZ, WIAK, WNAL, WOAW	North Dakota: Fargo, WDAZ, WPAK Grand Forks, KFJH, WQAB Mayville, KFJH	Ohio: Cincinnati, WAAZ, WHAG, WJAL, WJAL, WSAJ Cleveland, KDFM, WPK, WJAX, WTAM Columbus, WBAZ, WCAH, WEAZ, WMAN, WPAZ Dayton, AV5, WABD Fairfield, WJZ Granville, WJZ Greenwich, WCBZ Hamilton, WRK Lebanon, WPG Lima, WQAC Marietta, WBAZ Middleport, WSAK Newark, WBAZ Pomeroy, WBAZ Sandusky, WABH, WQAF Springfield, WNAZ Toledo, WTAL Wooner, WGAU Youngstown, WDBF	South Dakota: Brookings, KFJH Rapid City, WQAT Sioux Falls, WFAT Vermillion, WEAG Yankton, WNAZ	Tennessee: Knoxville, WNAV Lawrenceburg, WQAN Memphis, WMC	Alaska: Juneau, KFJH
District of Columbia: Washington, WABE, WCAP, WDM, WEAS, WHAG, WIL, WJH, WMC, WQAW, WRC	Florida: Jacksonville, WABG, WDAL Miami, WQAM Pensacola, WGAN, WLAZ St. Petersburg, WSAG Tampa, WDAE	Georgia: Atlanta, WSB Gainesville, WKAY Macon, WBLZ	Oklahoma: Ardmore, WQAA Bristow, KFJH	Texas: Abilene, WQAZ Amarillo, WDAZ, WRAU Austin, WCM, WNAS Beaumont, WJAM College Station, WTAW Dallas, KFJH, WDAO, WFAA, WRR El Paso, WDAH, WPAZ Fort Worth, KFJH, WBAZ Galveston, WBAZ, WIAO Houston, WCAK, WEAT, WEV Laredo, WWAX Orange, KFGY Plainview, WSAZ Port Arthur, WFAH San Antonio, ASB, WCAR, WAOI Sanford, WQAZ Tyler, WQAF Waco, WJAD, WJAL, WQAC Wichita Falls, WKAF	Hawaii: Honolulu, KDYS, KGU, KYQ, Lihue, KFBS	
Porto Rico: San Juan, WKAQ	Canada: Bellevue, CFCO Calgary, CHBC, CFAC, CFCN Edmonton, CFCR, CICA Hamilton, CKOC Innisville, CFCO London, CFCO, CIGC Montreal, CFCF, CFUC, CHYC, CKAC Ottawa, CFCO Quebec, CFCJ, CHCD Regina, CKLN St. John, CFCI Saskatoon, CFCO Toronto, CFCO, CFCO, CFCN, CKCB Vancouver, CICE, CKCD Victoria, CFCO, CHCE Winnipeg, CKY, CKZC, CJC	Cuba: Havana, WJAL Tunabo, BKV				

CHALLENGE SUPPORTS LIST'S CORRECTNESS

ONE DOLLAR will be paid to every Radiophone reader of Radio Digest submitting the most errors in any one station's listing in the Directory of Radiophone Stations, which appears in four parts, serially continuously, on page 23. Letters must reach Radio Digest's office not later than one week from date of issue corrected. Readers are not limited to correcting one station. Turn in corrections for as many stations as you can find—if you can find errors! Use separate sheet of paper for each station submitted and place name and address on each sheet.

The Reader's View

Fading of Signals

In your editorial of August 4 you said that no generally accepted theory to account for the fading of signals has been advanced.

The subject has interested me in common with many others. I make a few suggestions which I hope may interest you:

It is generally recognized that air molecules are ionized by the sun's rays and that the resulting charged air dissipates the energy of Radio waves, since the air is a partial conductor of electricity. An ionized layer of air, being a conductor, will act in the same manner as a metal reflector, though in lesser degree, to reflect the Radio waves. As night approaches the air becomes less efficient in conducting, with a consequent increase of signal strength, but it is highly probable that the air is always slightly ionized even in the absence of the sun's rays. This may be a result of light from the stars and moon, or the air may retain some of its charge for long periods after the ionizing rays of the sun have been removed. Even if the lower layers of air between two stations are completely

neutral electrically, there is the possibility that the upper layers are acted upon by sunlight, especially if the stations are in an east-west line. It has been stated by observers that the worst fading occurs in such a direction. Electric discharges also ionize the air.

Now as to the real cause of fading—there are three possible locations of the underlying trouble, namely, at the sending station, at the receiving station and between the two stations. It is possible that there may be a cyclic variation in the electrical state or condition of either the sending or receiving apparatus (tubes) but this is rather far-fetched. Of course an antenna system being swayed by the wind will become detuned; there is an additional probable cause in that layers of air of varying density may pass under the aerial and thus alter its capacity. If either of the two factors just mentioned were the contributing cause it would be possible to tune the station in again by adjusting the controls. However, in too many instances no amount of tuning will bring in the station. We must wait a few minutes until the signal increases in strength of its own accord; generally it is a gradual increase.

The facts seem to indicate that fading is due to variable conditions existing between the sending and the receiving station. We know that there are always layers of air of different densities, temperatures, and humidities; if we grant that these layers are always slightly ion-

ized, which is likely, we have at once a plausible explanation for fading. Suppose that a station is receiving with good audibility at any one moment, and suppose, also, that an extended layer of ionized air drifts between the sending and the receiving station; the signal waves will then be both reflected and absorbed by the conducting "sheet" of air and the signal strength at the receiving station will be materially reduced until the ionized body of air has drifted past the path between the two stations. There are, of course, many moving layers of air between two stations widely separated; consequently it would be expected that fading would be worse for such stations.

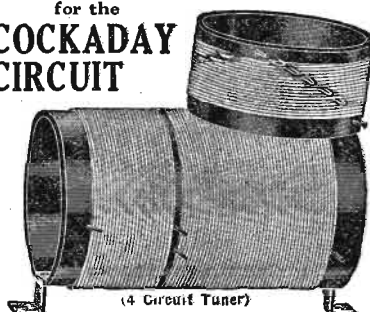
The varying ionization of the layers of air would result from the varying factors such as temperature, density and humid-

ity, when the air is exposed to the same ionizing source, such as sunlight. A further cause of ionization is the friction of the various air streams.

There is still another possible cause of fading in that the numerous other waves may interfere to cause partial neutralization but the air layer explanation seems more plausible.—A. G. Thomas, Lynchburg, Va.

Instead of soldering wires together in your set, solder them to a metal strip. It makes a better job.

EASTERN COIL SETS for the COCKADAY CIRCUIT



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

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

Hook-up directions and material list furnished free with each set of coils. Mail Orders Filled. Dealers Communicate. EASTERN RADIO MFG. CO. 22 Warren Street, Dept. R. D., NEW YORK, N. Y.

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W.D.11 or W.D.12.....\$3.50
U.V.200 or C.300.....2.50
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RADIO LIGHTNING ARRESTERS

\$2.00

Should be on every aerial the year 'round. Provides highly efficient lightning and static protection for the home. Fully approved by Fire Underwriters. Can be installed outdoors. Has no vacuum to lose. Install one in your aerial lead now—be safe. This pioneer radio arrester is backed by 31 years' experience in lightning arrester design. For sale by Dealers everywhere, or sent postpaid for \$2.00. Write for circular.

Electric Service Supplies Co.
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Hayter's

Radio Illustrated



Here is one New Yorker who didn't care a rap whether the news printers were striking or not. She is "Marilyn Ford," and

with "Efficiency" "noirlette" on a park bench she got as much news and entertainment out of the invisible word as from the printed
Keystone Photo



This girl can listen to her beau's sweet nonsense at her desk. He has made her a "private line" airphone and the typewriter is the aerial.
Swastika Photo
Daddy told the kids (below) there were birds in the Radio set—and see what followed! Leo and Helen Eismann are the "investigators" with Dolly bossing the job. Question: What'll father do? K. & H. Photo

The Radio room and Operator P. N. Ritter of the "Radio Doctor Ship," otherwise U. S. S. President Polk. She has gained that sobriquet by sending much medical advice to sister vessels in her trans-Atlantic service. She has a powerful outfit
Fotograms Photo

