

New Unidyne Two-Tube Set and Amplifier; Operating and Trouble Shooting; Improving the Single-Circuit Tuner; Important Programs for Week Advance

Radio Digest

EVERY WEEK **Illustrated** PROGRAMS **TEN CENTS**

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

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R.R. UNION TO RADIOCAST

WGR TAKES WORLD'S RADIOCAST RECORD

RECEIVE BUFFALO STATION IN SOUTH AUSTRALIA

Spans 11,760 Miles, Only 700 Less Than Half Way Around Earth's Circumference

BUFFALO, N. Y.—Establishing a new world's record, Radiocast WGR, Federal Telephone and Telegraph company here, transmitted both voice and music practically half way around the earth, or to be exact 11,706 miles airline, when on March 30 at 8:45 p. m. Australian time, W. J. Bland of Butter Terrace, Alberton, South Australia operating 5AG, and Clement E. Ames, secretary of the eighth Australian division of the Wireless Institute, heard station call letters WGR and a violin trio.

This achievement gives WGR a transmission record that can hardly be excelled. The distance airline of 11,706 miles is only 700 miles short of half way around the earth where it is impossible to go further as the message would be returning.

WLW on 423 Meters; WBAV Divides Time

Waves of Two Same as KPO, San Francisco

CINCINNATI.—WLW, Crosley Radiocast here, is now using its new wave length, 423 meters, the change having been made as a result of a special request made by the station to the department of commerce.

This wave length is the same as is used by KPO, Hale Brothers, San Francisco, but because of the great distance between the two stations and the difference in time, there will be no interference. It also is the same as will be used by WBAV, Erner and Hopkins, Columbus, O., but WBAV and WLW will divide time.

WGY, Linked with WJZ Offers Goldman Concerts

SCHENECTADY, N. Y.—WGY, General Electric company Radiocast here, offers a series of eight concerts by the Goldman Band of New York, Saturday evenings at 7:15 o'clock Eastern time. The band of sixty musicians, conducted by Edwin F. Goldman, plays at the Mall, Central Park, New York and is connected to WGY by wire to the control room of WJZ in New York, which station is also giving the Goldman concerts.

WJAS "OP" PINCHED FOR SPEED (ALMOST)

BURLINGTON, IA.—Harry Waugh, operator of WJAS, was arrested recently for speeding here when on his way with his bride to catch the honeymoon train. With no time to waste before train time, the couple was hailed into court and fined \$25. The fine paid, however, was returned immediately when the judge laughed and told the newlyweds the arrest was but a practical joke.



Sra. Carmen Fernandez Ramos, winner of the Cuban Radio Beauty contest, will give a very interesting beauty talk July 19 from FWK, Havana. Gladys Lloyd (left) who appeared in the cast of "Mrs. Wiggs of the Cabbage Patch," which was recently Radiocast through WGY, Schenectady.



BROTHERHOOD RESOLVES TO ERECT PLANT

Big Locomotive Engineers' Body Plans Station Atop Its New Bank

Cleveland Air Crowded

By P. A. Price

CLEVELAND.—Typifying the progressive spirit of that powerful organization, the Brotherhood of Locomotive Engineers, in convention recently assembled here, is reported to have passed a resolution to install a high power Radiocasting station in the union's new bank building now under construction at St. Clair avenue and Ontario street.

The Brotherhood of Locomotive Engineers is known as one of the strongest unions of railway employes in the United States. Already identified with various activities in the commercial world, the body will lead organized labor again in the Radio world. It will have the first Radiocast in the country to be operated by a labor union, a situation which is analogous only to WOA, Woodmen of the World, station at Omaha, both being sustained by organizations whose members live in all parts of the country.

Cleveland Air to Be Full

Beside the new locomotive engineer brotherhood Radiocast, two more new stations are proposed for Cleveland. One will be located on the Hollenden hotel and operated by a company now being organized; the other will be a less powerful, 100-watt outfit which will be operated by Matthew Broz.

Radiocast WHK, operated by the Radlovox company in their new quarters in the Hotel Winton; WJAX, of the Union Trust company, and WTAM, the Willard Storage Battery company, will continue as at present, with a possible later rearrangement of hours to accommodate the division of time required by the additional stations. Rumor has it that another of Cleveland's hotels may house another station, but a definite announcement cannot be made at this time.

The plurality of plants will, no doubt, (Continued on page 2)

CRYSTAL MAY BE FADING SOLUTION

Dr. G. W. Pierce Makes "Piezo-Electric" Quartz to Hold Radiocasts More Constant

CAMBRIDGE, MASS.—Crystals are coming back. This time they are going to play the part of preventing the shifting of the carrier wave which is so frequently mistaken for fading. This is the latest word from the laboratories of the General Radio company located in this city.

Dr. G. W. Pierce of Harvard is responsible for the new use of crystals. These are made in the laboratories of the General Radio company, and are called "piezo-electric" crystals. Although cut from rough quartz along certain prescribed scientific rules, they are very similar in appearance to a glass lens.

When the crystal is put into an alternating electrical field it vibrates. This action is called the "piezo-electric effect." The value lies in the crystal's ability to vibrate at a constant Radio frequency.

In an oscillator using this crystal, it is placed in the grid circuit of a tube. The variations in the potential of the grid are produced by the alternating E. M. F. of the crystal. The vibrations of the crystal are maintained by plate supplied energy.

BLINDED VET AFRAID WBZ QUIT BASEBALL

SPRINGFIELD, MASS.—Hearing a false rumor that WBZ, Westinghouse Radiocast here, was to stop giving the Eastern League baseball games, a Radio-ball fan immediately pleaded by letter not to do so. He added that he was a blinded world war veteran, not able to stand the crush of attending games, and that Radio was his only entrance to the national sport.

No. 9 OFFICIAL BALLOT

Announcers' Contest

RADIO DIGEST FIRST ANNUAL GOLD CUP AWARD

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

Please credit this ballot as one vote for:

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

Signed

Address

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

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

.....

CUBA IS NEW ENTRY IN GOLD CUP AWARD

STANDING OF NOMINEES TO APPEAR NEXT ISSUE

Four New Nominations Make Total 122 in Race—Rules and Regulations Given

Cuba has entered the Radio Digest First Annual Gold Cup Award competition, mentioning Raul P. Falcon of PWX as their choice as the world's greatest announcer. An old reader of the Digest, Jose L. Ferriod, at Havana, sent in the nomination certificate for Mr. Falcon with the attached notation, "Is this nomination possible?"

Absolutely! Nominations from any country in the world are in order—solicited in fact. The Gold Cup Award is a world competition, not purely national, although the American announcers undoubtedly have a tremendous advantage in the magnitude of the U. S. invisible audience.

Standings Next Week

But four new nominations filtered in this past week. Standings of the contest will appear for the first time next issue when the number of votes cast will be given for every nominee having more than 500 to his or her credit. From this period on to the end of the voting, it is believed the competition will become a fast race for popularity with various nominees changing places from week to week.

The four new nominations are: Carothers, M. L., WBAV, Columbus. Falcon, Raul P., PWX, Havana, Cuba. Gaylord, Chet, WDBH, Worcester. Sims, Lee, WTAS, Villa Olivia.

The complete list of 118 nominees was given last issue. The total number of nominees has now reached 122.

Nominate Now; Vote Later

The list of nominees, given last issue and supplemented this week, shows what announcers have been nominated and have nothing to do with their standing so far as the actual balloting is concerned. If your favorite announcer's name has appeared, do not bother to renominate him. One nomination is enough.

Just save your votes! Remember that consecutive votes, saved in groups, and turned in together, count for more.

If your favorite announcer's name has not yet appeared, just turn to page six, fill in the nomination certificate and send it to Radio Digest, care of the Gold Cup Award Editor.

Remember to save your ballots appearing on page two each week. It is by means of the ballots that the award will be made. The man or woman polling the highest number of votes wins.

Rules and Regulations of Award

All broadcast station announcers are eligible to enter. Nominations can be made either by the announcer or any Radiophan. Nominations should be made by using the "Nomination Certificate" appearing on page six.

Beginning with the May 24 issue a ballot has appeared on page two of each issue of this publication. These ballots are numbered consecutively from one to sixteen.

The voting officially opened with publication of Ballot No. 1 in the May 24 issue. The contest closes with ballot No. 16 to appear in the September 6 issue of Radio Digest, and the official closing date of this contest is midnight, September 8, 1924.

For sending in four consecutive ballots, there will be a ten vote bonus; eight consecutive ballots, twenty-five vote bonus; twelve consecutive ballots, fifty vote bonus; and sixteen consecutive ballots, seventy-five vote bonus.

Voting will consist of filling in the ballots with the name, initials or nickname of the announcer and the station and mailing to the Gold Cup Award Editor.

Highest Vote Wins Gold Cup

The broadcasting station announcer polling the largest number of votes in the contest will be awarded the Radio Digest gold cup. In the event of a tie each tying contestant will receive the same award.

Anyone may vote for their favorite announcer with ballots clipped from Radio Digest.

All votes to be credited must be mailed on or before midnight, September 8, 1924.

The Radio Digest First Annual Gold Cup Award will be made by a committee appointed by the publication.

Any question that may arise during the contest will be decided by the Gold Cup Award Editor. His decision will be final.

It is reported that 2LO, London, is to have the entire London Zoo Radiocast.

'Mike' Staid French Academy First Time

Aloof Institution Harkens to Wheels of Progress

PARIS.—The staid, conservative and reticent French Academy has at last succumbed to the march of progress and has allowed the Radiocast microphone to invade its sacred precincts.

Founded long ago by the great Cardinal Richelieu, the Academy has maintained its aloof air throughout all the years of its existence. Those elected to its magic circle for their honor in literary or other lines are almost the only persons who were ever permitted to attend the meetings. An occasional outsider was permitted at the seances; but such permission was as great an honor as for an ancient Greek to speak before the oracle.

But recently when the newest elected member, M. Henri-Robert, was received for the first time, the director of the Posts and Telegraphs Radio Station PTT at Paris presented such a clean-cut case to the academicians that the latter consented to have the microphone brought into the assembly hall and to have the speeches Radiocast to a waiting public.

R.R. UNION RADIOCASTS

(Continued from page 1)

necessitate that the new entrants operate on wave lengths higher or lower than used by stations now in the field. This has been anticipated by the Broz station, with a proposed wave length of 243 meters. Present wave lengths in Cleveland are 283 meters for WHK, and 390 meters for WJAX and WTAM.

WNYC, New York City, Has Dedicatory Program

NEW YORK.—Famous before it ever went on the air because of the city's fight with the A. T. & T. company to gain possession of a Radiocast, Station WNYC, owned by New York city, recently had its dedicatory program. Beside a speaking schedule including many prominent government officials, a scintillating artist program was given.

The wave length of WNYC, a class B Radiocast, is 526 meters, thus interfering with no other New York stations.

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Looking Ahead

E. T. Flewelling, Inventor of the Single-Tube Flivver Super, has a surprise for you! Something new, radically different and original of course—but you knew that when we said Flewelling. You'll have to wait for it, though.

Hero Circuits of Radio—Paul Edelman's present chapter in his "Thirty-Minute" Radio lesson series—will continue next issue to take up various famous hook-ups. Mr. Edelman will tell you about reflex combinations, link circuits and one-tube super regenerators.

Radio Frequency on the Unidyne, England's New Receiver, will be discussed next week by H. J. Marx in his concluding article on this recent development in sets employing the four-electrode tube.

How to Make a Single-Tube Super Portable Set, a handy set for the camp, beach or automobile, is the subject of an article by Lee H. Bolen next issue. You can wind the loop for this set around the carrying case or cabinet. The circuit is essentially Flewelling in principle.

Announcers' Gold Cup Award Standings will be tabulated and published next week for the first time. Wonder who is leading with the highest number of votes? You'll be surprised.

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Goulding Mfg. Co.....Milwaukee, Wis.

ONE AERIAL ENOUGH FOR NEIGHBORHOOD

SEE FEWER ANTENNAS RESULT OF NEW DEVICE

Taylor-Young "Coupling-Tube" Unit Promotes Better Reception and Fewer Overhead Wires

By Carl H. Butman

NEW YORK.—The invention of Dr. A. H. Taylor and L. C. Young, permitting multiple reception on a single antenna, may prove as revolutionary in ordinary household and apartment reception as it has on the navy fighting craft. Naval warships, by employing this principle of receiving on one antenna, are able to receive and transmit several messages at once. With its application to ordinary Radiocast reception, it will be possible for each city block or suburban neighborhood to erect a community antenna for the use of all fans in that section without interference. Any number of sets may be tuned to special stations on the same or different wave lengths.

In ordinary reception if more than one receiver is connected to the same antenna, when one set owner twists his knobs to hunt for a station, he upsets the others' adjustments. It is easy to appreciate the pandemonium that would exist if twenty-five receivers were connected to the same antenna, each owner trying to satisfy his own searchings. With the Taylor-Young device this difficulty is overcome.

No Tubes or Batteries Used

The present device does not employ any vacuum tubes or batteries. It is a simple arrangement of circuits, with properly adjusted electrical constants, and can be built as a unit attachable to any commercial receiver and be built into any design of receiver.

The Navy has had the device in use for some time, the necessity having arisen for receiving a large number of communications on short wave lengths at the same time. It is impossible aboard ship to rig up all the separate antennas that would be necessary to give each receiver a collecting agency. The navy, realizing that this feature is undoubtedly valuable to Radiocast receiving conditions, has consented to the disclosure of the arrangement for commercial use. For this reason it is not desired to publish in detail the circuit arrangement for which patent applications have been filed.

Is Selective; Allows Set Calibration

Besides its unique value in multiple reception, the "coupling-tube" unit is said to be extremely selective, bringing stations in on an exact setting of the tuning condenser and cutting out all other stations. Strangely enough, the setting of the dial is always the same no matter to what receiver or antenna the device is connected. In other words, the dial may be marked by the manufacturer with the names of stations and no matter under what conditions it is used, the settings remain the same, except when then transmitting stations change their wave lengths or power.

A model of the device, set up in Washington with a reflex receiver, showed WCAP at 59.4 degrees on the tuning condenser dial, and the setting is exactly the same for WCAP in New York City on a Radio frequency receiver. This setting is so sharp that if it is turned to 59 or 60 degrees the station is gone.

The device is also said to be a great aid in reducing the effect of radiation from a receiver of the regenerative type which "squeals" when improperly operated. Its selectivity also helps to reduce static troubles as the static is by-passed to ground, except on the very narrow band to which the unit is tuned. By a simple connection it may be converted into an effective wave trap, selectively trapping out a nearby bothersome station.

In one of the larger streets of London only two houses are without Radio antennas

WGR PIPE ORGAN ON AIR ONE YEAR NOW

BUFFALO, N. Y.—The first anniversary of the pipe organ recitals, played by George Albert Bouchard on the Hotel Statler organ, and transmitted from WGR, has been celebrated. With the exception of Sundays and a few holidays, Mr. Bouchard has gone on the air every day from 12:30 to 1 p. m. Eastern time. More than 1,000 compositions have been played.

EVERY COUNTRY TO GET KDKA CONCERT

PITTSBURGH.—KDKA is arranging to Radiocast a series of international concerts and musical programs. A schedule is being prepared in which one evening will be devoted to each nation, and the concert will be given in the language of that nation, as well as in English. This is the first time a complete series of international concerts has been arranged.

SNAKE CHARMING MODERNIZED



Snakes can be charmed by Radio as easily as any other way. Just to demonstrate, Miss Marie Conkwright, well-known artists' model, is entertaining her pet reptile with a "listen in." Pictorial Press.

Seven Thousand Recruits Each Week for WOR Gym

NEWARK, N. J.—WOR's morning gym class, directed by A. E. Bagley, physical director of the Newark Y. M. C. A., is gaining in popularity literally by leaps and bounds. It is estimated by the voluminous correspondence received that

the class is gaining 7,000 pupils each week. Radiocast WOR will shortly inaugurate an "Early Bird Association" composed of the thousands who face the loud speakers each morning and go through the prescribed paces. Membership in the Early Bird association may be secured by fans sending names and addresses to WOR.

START BUILDING OF DENVER G. E. PLANT

WILL BE ON AIR BY FALL; HIGH POWER RESERVE

Studio Four Miles from City to Incorporate Best—Has Variable Deadening Period

DENVER.—Work has been started on the General Electric company Radiocast here. In the late fall or early winter it will be on the air, completing the General Electric's nation-girdling system of three stations, the first of which, WGY, opened at Schenectady, N. Y., early in 1922 and the second, KGO, at Oakland, California, early in 1924.

In the construction of the Denver station full advantage will be taken of the experience gained in the operation of both the Schenectady and Oakland Radiocasts. Every technical advance proved by extended use will be included in the equipment and the entire plant, like the Oakland station, will be housed in its own building. Provision will be made in the equipment to go to higher power than is now permitted should the regulations of the department of commerce be changed.

Variable Deadening Period Plan

The station, a two-story structure, will be located four miles from the heart of Denver and on the main eastern motor highway. The studio building first floor will be divided into reception room and offices for the executives, the correspondence and the program forces. On the second floor will be two studios, a waiting room and a control room for the station's amplifying equipment.

The first and main studio will be big enough to comfortably accommodate large musical organizations like bands and choruses. The deadening or reverberation period will be made variable through the use of movable hangings and floor coverings. As a program varies from speaker to band, or soloist to orchestra, different degrees of deadening are required to secure perfect tone quality and the Denver station will so be equipped that it may be readily changed to care for the different extremes of sound. The ceilings and parts of the side wall will be sound deadened by means of a one-inch thick felt covering over which decorative tapestry cloth will be hung.

Europe Hears Porto Rican Station Loud

Paris and Ships on Atlantic Get WKAQ Regularly

SAN JUAN, P. R.—Word has just been received from Paris that Radiocast WKAQ here of the Porto Rico Telephone company is being received with exceptional clearness in Europe and by ships in the Atlantic, 2,000 miles or farther away from the sending station.

As a specific illustration, the steamer "Merope" has reported to the Eiffel Tower station that it has been reproducing the programs of WKAQ on a loud speaker at distances of upwards of 2,000 miles.

WKAQ is the sister station of PWX at Havana, the equipment of one being a duplicate of the other, and both being under the same management.

WSAI Buys Five-Kilowatt Transmitter for Fall Use

CINCINNATI.—A five-kilowatt transmitter has been ordered for WSAI, U. S. Playing Card company here, and will be in use in the early Fall. The apparatus will be so adjusted that it will be possible to use two and one-half and one kilowatt instead of the full power.

It is said that a Radio set is especially valuable to hospitals in the treatment of persons suffering with nervous diseases.

THE ANTENNA BROTHERS

Spir L. and Lew P.

Part II—Snaring the Waves



"HOW TO TALK" IS WORRYING EUROPE

DEMAND FOR ONE RADIO TONGUE INCREASES

Geneva Broadcasts Weekly Lessons in Esperanto; Daily Newspapers Start Discussions

By F. M. Delano

PARIS.—The question of international Radiocasting in Europe is becoming more and more the great topic of the day. The musical programs are, of course, perfectly satisfactory to all, the French and British ones being particularly popular in those countries where Radiocasting is still undeveloped.

But most of the European amateurs are as much interested in the lectures as in the music, especially in the talks of scientific nature which are now Radiocast by several of the stations.

Here appears the great stumbling block about which so much has already been written—the question of the variety of languages spoken.

Seek International Tongue

Even the daily newspapers are taking up the discussion of an international language as the only possible solution. Geneva is now Radiocasting a lesson in Esperanto once a week. Dr. Pierre Corret, of Versailles, France, is writing on the question. Esperanto has been tried in Poland with doubtful success. From another group of enthusiasts comes the

GETTING VOTES



In the recent German elections politicians hastened to use the new agency. Former Chancellor Marx speaks to voters from a Berlin Radiocast.

support of Ido. This internationalization of conversation

is not new. One of the first suggested languages, Volapuk, dates from 1880. Others in the list of universal tongues are Esperanto, Occidental, Romanal, Medial, Espido, Unisal Interlingu, Qosmani, Federal Unilingue, Universal, Reform Neutral, Ido, and, for the 1924 model, Aspiranto.

WLW to Add Ilo Lessons

CINCINNATI.—The Spanish and French lessons taught by Radio from WLW, Crosley Radio corporation here, have met with such hearty response from the listener-pupils, that a new language will be added in September. Ilo, "La Internaciona Linguo," will enable listeners in other countries to more fully enjoy the numbers announced from Radiocast WLW, for plans now being formulated, will include the studio director's announcements in several languages. In addition to the announcements, students will be taught Ilo in the regular WLW Radio university classes. Fred Smith, who has spent many years in Europe, is studio director of Radiocast WLW and will supervise the classes.

CKAC Teaching Ilo Already

MONTREAL, P. Q.—Fans who receive broadcasts from CKAC are familiar with the fact that all announcements are made in French and English. But now, a third language will be added: "La Internaciona Linguo"—Ilo, the perfect Radio auxiliary international language.

Jacques N. Cartier, CKAC director, and his staff are studying Ilo, and find it extremely easy to learn. By the time the new big plant of CKAC has been installed, everybody connected with the studio expects to be able to talk Ilo, and then this musical "tongue" will be on the air regularly.

Mr. Cartier points out that CKAC serves a big Italian colony, a Greek village, a miniature Vaterland, a tiny Chinese town, a large Jewish settlement and several other small colonies, whose inhabitants speak Polish, Roumanian, Russian, Galician, Ukrainian, Dutch, Swedish, Norse and twenty other languages, besides two big majority French and English-speaking nationalities.

CKY to Teach Ilo or Esperanto

WINNIPEG, MAN.—For some time past CKY here has been considering teaching Esperanto. Now "La Presse" suggests that all Canadian Radiocasts teach a new international language, Ilo. The director of CKY is now making comparisons between the respective merits of Ilo and Esperanto.

Whichever is found to be the more suitable will be adopted in the near future. The University of Manitoba has already used CKY for teaching French.

Loud speakers in the bandstands of several parks are replacing the summer band concerts in a number of smaller towns.



IT'S ADJUSTABLE
but, if it wasn't, the Superspeaker would still be the King of all Reproducers. For the resonance it reproduces is all music—there is no vibration of the big, substantial horn at any musical pitch.

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A type for Every Circuit



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 - 5 to 1 type R-21
 - 10 to 1 type R-13
 - Power Amplifying (Push-Pull)
 - Input, type R-30
 - Output, type R-31
 - Long Wave Intermediate Frequency, 4,000 to 20,000 meters (15-75 KC) type R-110
 - Radio Frequency
 - Short Wave—Tuned (150-550 meters) Type R-10

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 - Above suitable for Super Heterodyne and similar circuits.
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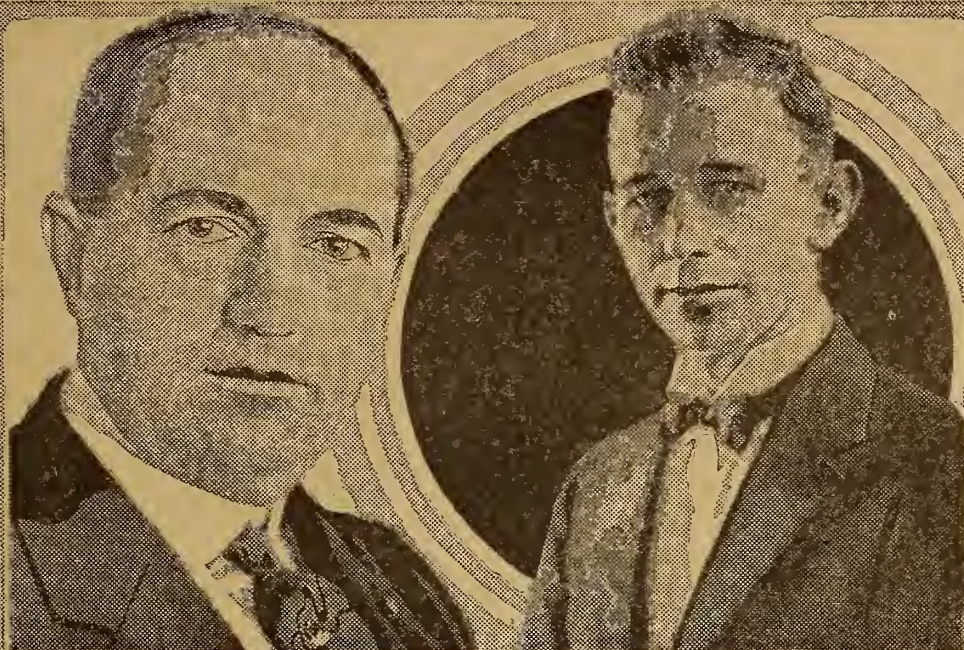
ALL-AMERICAN Amplifying TRANSFORMERS

LARGEST SELLING TRANSFORMERS IN THE WORLD

BEFORE THEY THOUGHT OF "MIKES"



Above is one of the announcers at a mid-western station K—. To the right is W. T. Pierson, who is the announcer at Station WCAP, located in Washington, D. C.



The young lady shown above is one of the few women announcers in the country at the present time. She is located at Station W—, in the East. To the left is shown H. W. Arlin, the first announcer that KDKA ever had; he's still there.

William T. Pierson, WCAP

THIS is WCAP, the Chesapeake and Potomac Telephone company, says William T. Pierson, to Washington Radiophans and the other thousands of listeners in, but it is doubtful if "Dick" ever thought that official Radio announcer would be his life work.

Mr. Pierson is a native son, of which he is justly proud. He was graduated from the schools of Washington, including Eastern high school, following which he went to George Washington university, also of this city. From March, 1904, to January, 1907, he was employed in the engineering department of the Chesapeake and Potomac Telephone company. He left the company to become a music composer and was successful with many songs, two of which were widely used in the camps during the late war.

Announcer Pierson is a member of the Washington Rotary club; an honorary member of the Optimist club; member of the Washington Centennial Lodge of Masons; the Columbia Historical Society of D. C. and of the Society of Natives of D. C. He is also a life member of the Eastern high school and George Washington university alumni associations.

He was appointed manager of Radiocast WCAP in August, 1923. In addition to his duties as manager and announcer Mr. Pierson is occasionally heard playing and singing. He is very popular with Washington Radiophans.

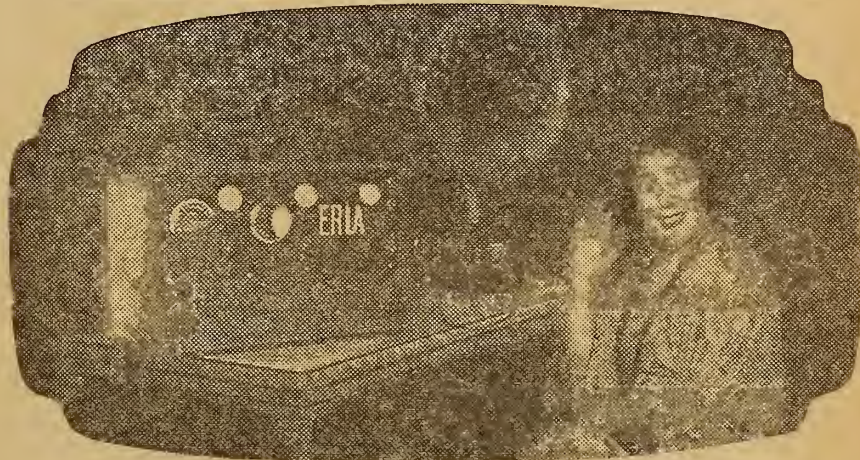
H. W. Arlin, KDKA

THIS young man has the distinction of being the world's pioneer Radio announcer; having been engaged in this work since KDKA was first inaugu-

rated. Though a veteran Radio announcer, he is still a young man and far from that period of life when children or Englishmen will point him out on the street and cry "Beaver." He was born December 8, 1895 in La Harpe, Ill.

Since leaving the University of Kansas in 1917 he has been employed by the Westinghouse company at East Pittsburgh, Pa. He is a lover of all sports, very fond of public speaking, and as far

(Continued on page 6)



"Simply Divine"—Tamaki Miura

THE golden witchery of Tamaki Miura's internationally famous art finds ideal counterpart in the marvelous purity and tone quality of Erla Duo-Reflex reception.

"Never have I heard anything so beautiful," concludes the eulogy of the Japanese nightingale upon the supreme flawlessness of Erla reproduction. "The tone is simply divine, so pure, so perfectly natural."

Foremost musical authorities of all nations acclaim the exquisitely true, rich tone exclusive to Erla receivers as the ultimate in radio achievement.

Responsible for this unique excellence are Erla reflex and audio transformers, synchronizing perfectly received radio and reflexed radio, as well as rectified radio and reflexed audio currents, in their simultaneous passage through amplifying tubes, with consequent unprecedented elimination of distortion.

You, too, can enjoy outstanding Erla superiority at minimum cost and effort. Complete Erla parts, for sale by leading dealers, are assembled into the most modern and efficient of receivers in a few hours' time. Easily understood blueprints guide every step.

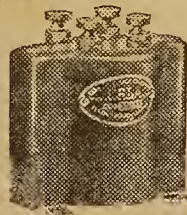
Ask your dealer; or write, giving your dealer's name.

Electrical Research Laboratories
Dept. A, 2500 Cottage Grove Ave., Chicago

ERLA



Supreme sensitiveness and amplifying power of Erla reflex transformers is the secret of unmatched Erla range and volume. List \$5



Erla Push-pull transformers embody numerous scientific advantages over other types. For details, consult Erla Bulletin No. 22. Pair \$10



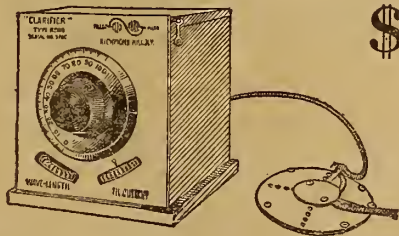
Superior accuracy of Erla tested capacity condensers is invaluable for securing utmost efficiency from any receiving unit. 30c to 75c



The GREBE CLARIFIER



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



\$30

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

And—

Is Easily Connected

Ask your dealer or write for literature

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

Western Branch—451 East 3rd St., Los Angeles, Cal.

NOMINATION CERTIFICATE

Announcers' Contest

Radio Digest First Annual GOLD CUP AWARD

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

Dear Sir:

I nominate

Station and Call.....

Signed

Address

Town State.....

Elementary Course in Piano on WDAF

Short Lessons for Children Tues-
days and Fridays

KANSAS CITY, MO.—WDAF, Kansas City Star, has inaugurated the Radiocasting of piano lessons Tuesday and Friday evenings of each week throughout the summer, beginning recently. A series of twenty lessons has been specially prepared by Miss Maudellen Littlefield.

The lessons are short. The only equipment necessary is a piano, receiving set capable of hearing WDAF, and a "copy book" ruled with the musical staff. The plan permits those taking the course to send papers to Kansas City for grading. The course, designed primarily for children, is equally applicable to others.

ANNOUNCER SKETCHES

(Continued from page 5)

as vices are concerned, is practically immune for he doesn't even smoke.

His hobby is Radio, from which he derives a lot of pleasure and satisfaction. Has had the honor of introducing for Radiocasting Marshall Foch, David Lloyd George and many other notables. Unfortunately for single ladies, Mr. Arlin is very well married, so there is no romance left in him. His voice is strong and his diction is perfect, making him one of the best announcers of the present day.

A hydrometer is used for testing lead cells but not for nickel iron type.

Protects French Forests

PARIS.—Radio has been called in to help fight forest fires in the south of France where large losses were sustained last year from this cause. A station has been erected on a high hill overlooking the forests.

EVEREADY Radio Batteries

—they last longer

Conspicuous for vi-
tality and endurance
—the right batteries
by test and proof for
every radio use.

NATIONAL CARBON CO., INC.
Headquarters for Radio Battery Information
New York San Francisco

CANADIAN NATIONAL CARBON CO., LIMITED
Factory and Offices: Toronto, Ontario



*"Isn't it wonderful that Junior can tune in so nicely.
"Oh, no. There is nothing complicated in it. Anyone can do it.
The one control makes it so easy."*

Bristol Single Control Radio Receiver

The well-known Grimes Inverse Duplex System (non reradiating) is utilized in this Receiving Set. Because of the reflex, only four tubes are required to give power equivalent to six. The price, without accessories, \$190.00.

Audiophone Loud Speaker

You forget the radio equipment when listening thru the Audiophone Loud Speaker. The tone is full, clear and pleasing. It gives a true reproduction of the original. Made in three models—Senior \$30.00, Junior \$22.50, and Baby \$12.50.

Complicated combinations are eliminated when tuning in with Bristol Single Control Radio Receiver—every station is on the one dial. It gives the joys of radio with technicalities left out.

Ask for Bulletins Nos. 3014 and Ay-3015

Made and Sold by
THE BRISTOL COMPANY
Waterbury, Connecticut

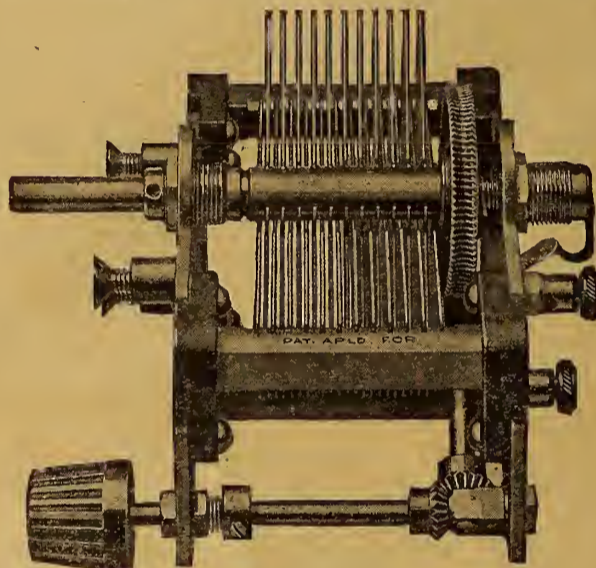
The Radio Sensation!

The new American Brand Worm Drive Vernier Condenser, with a *hundred to one* ratio Worm Drive geared vernier adjustment.

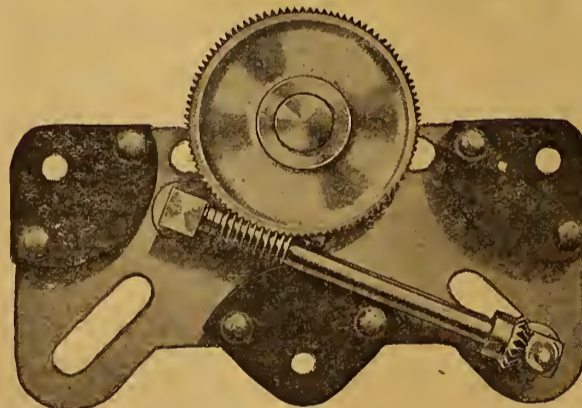
This is the highest ratio gear adjustment ever developed on Variable Condensers. With this adjustment the plates may be moved so slowly that the motion is hardly noticed by the eye.

A remarkable micrometer adjustment of the entire set of movable plates can be obtained. This wonderful achievement is of special importance to the radio fan seeking distant stations.

Another tremendous exclusive feature—the back panel of American Brand Condensers is adapted for the mounting of any coil desired for use in the set.



The 100 to 1 Worm Drive



A. B. Condensers are made from finest heavy brass. The plates are perfectly flat and will never get out of line. Plates and supports are in natural finish, keeping radio frequency losses at a minimum. Mechanically and electrically a perfect job.

And the price of this Super Brass Plate A. B. Condenser with Worm Drive Vernier (23 Plates .0005 mfd.) is only . . . **\$5.00** 13, 17 and 44 plates with or without Worm Drive Vernier at proportionate prices.

Please ask your dealer to show you this wonderful condenser. If he can't do so, write us for descriptive illustrated folder—and send us your dealer's name.

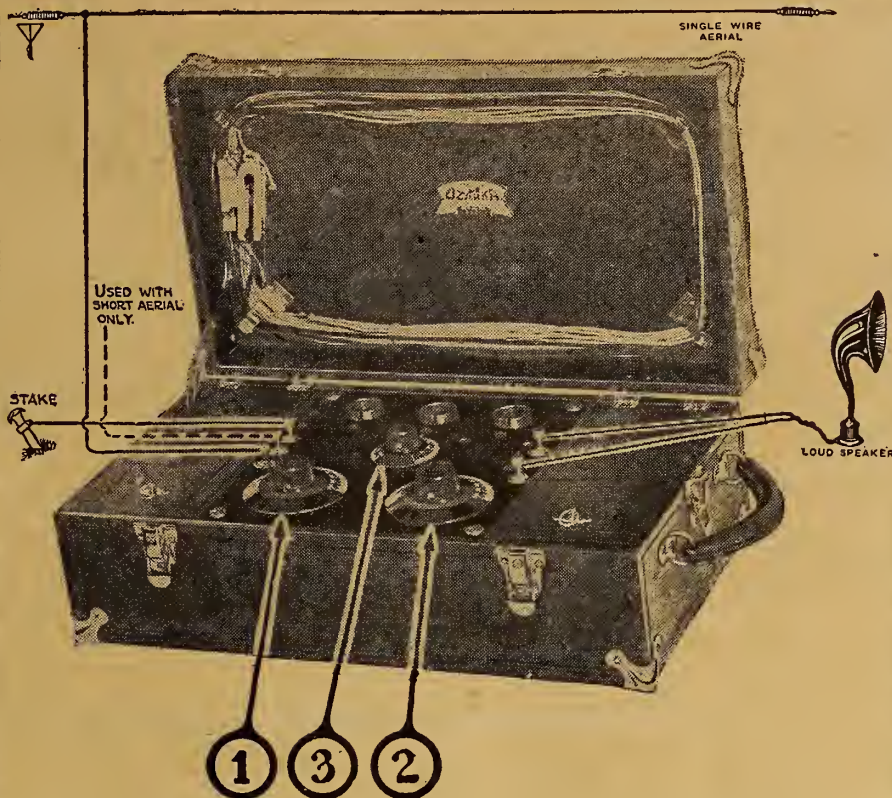
NOTE TO DEALERS: If your Jobber can't supply you with A. B. Condensers write us.

**AMERICAN BRAND
CORPORATION**
8 West Park St. Newark, N. J.
Factory—Philadelphia

OPERATING AND TROUBLE SHOOTING

For the Owner of An Ozarka Portable Receiving Set

OPERATING an Trouble Shooting" is a Radio Digest feature whose purpose is to study the late models of various standard receiving sets and to show the newly initiated Radiocast listener, who has purchased such a set, how he can operate it to get the best there is in it and how he can overcome minor difficulties which may be causing some trouble. On page 7 this week the Ozarka Portable Receiver is described. Radiophans with other sets will also find these articles worth while reading, particularly the notes on trouble finding.



IN THE top of the cabinet is 90 feet of green colored aerial wire. On the instrument you will note two posts marked Short ANT. and Long ANT. If you are some distance away from powerful Radiocast stations, connect one end of aerial wire to post Short ANT., but if you are in the same city with powerful stations and wish to cut out their interference, use post Long ANT. On the other end of the aerial wire you will find a porcelain insulator; run a piece of heavy twine or small rope through the hole of the insulator. Stretch out the wire and tie to anything convenient and as high as possible. Don't let it drag on the ground, and keep away from branches of trees, if possible.

It will be found that this length of aerial is just right for use on the Ozarka

Portable. Under most conditions, when you have to use a shorter wire, simply disconnect the porcelain insulator and run the wire through so that the insulator will always be between the tree or post you tie to. Bear in mind that the higher the aerial, the better the results.

Where it is desirable to cover extremely long distance, you may find that even a longer aerial than the one furnished will give results. It will be necessary to do a little experimenting, depending on the locations you are in.

Ground

A 10-foot length of black wire is pro-

vided for making the ground connection. This wire has a heavy clip at one end, this being connected to any grounded metallic object, and the other end to the binding post on the set marked GROUND. The ideal ground connection is a water pipe or iron rod driven 6 feet into the

ground. However, these will not always be available, so some other arrangement may be necessary.

If the set is being operated near a lake or stream, the ground wire may be laid in the water. Other suggested grounds are pumps, lightning rod grounds, wire laid in a spring, windmill tower, if not setting on cement base, wire fences, or the frame of an automobile, etc.

It will be noted that some of these, such as the automobile frame and wire fences, are not connected directly to the ground. They are known as counter-poise grounds. Any fairly large metal structure will serve as a ground, even though it is not electrically connected to the ground, although it usually will not be found as satisfactory as a direct ground connection.

Directions for Tuning

It will be noted that there are only three tuning controls, namely, the two large dials marked one or two in the diagram, and the small one, number 3. This small dial merely controls the filaments of the tubes, and is not at all critical in adjustment. The proper setting for this will vary with the condition of the A battery, but a very little experimenting will show the correct setting.

First, turn dial number 3 about half way. Dial number 1 is the tuner and number 2 is the Radio frequency tuner. It will be found that the proper settings for these dials will very nearly correspond, although there will always be a slight difference between them. It is necessary to operate both dials simultaneously in tuning. Slowly turn number 1, and at the same time dial number 2 backward and forward. It will be noted that as number 2 passes one point, a click will be heard in the phones. The point at which this click occurs will change every time dial number 1 is changed. If a powerful station is operating nearby, the music or speech will be very quickly heard. How-

(Continued on page 8)

BUILT BY RADIO ENGINEERS

FOR THOSE WHO DEMAND THE BEST
Great selectivity—no static—quality reception



Many Advantages

Lincoln Collapsible Loops offer many advantages, appreciated by Radio Engineers and Radio enthusiasts.

Wave length range with 23 plate condenser is 160 to 600 meters.

H. F. Resistance at 400 meters—only 7 ohms.

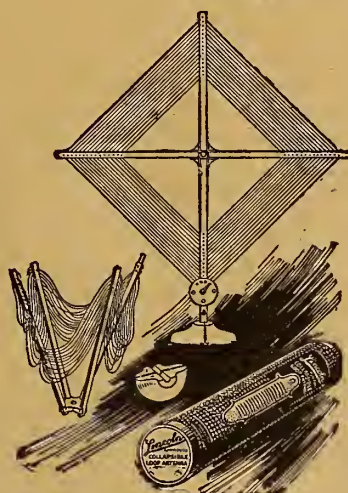
Wire is stranded, flexible and of great tensile strength and high conductivity. Inductance .2 millihenry.

At your dealers. Tapped Loop \$3.00
Without taps \$6.50

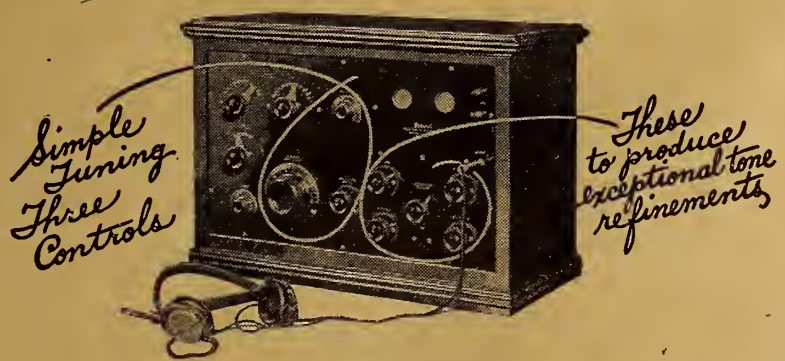
If your dealer cannot supply you, order direct, giving us his name.

Lincoln Radio Corporation

224 N. Wells St. Chicago, Illinois



Write for Catalog



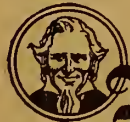
IT HAS been the tradition of the Federal Company, over its 25 years in manufacturing Electrical Communication Equipment, that it must give its users the highest refinements of the art.

Federal tradition will not permit the manufacture of a radio set just for radio noises. Each and every manufacturing necessity to produce a harmonious set is known to Federal Engineers, and no Federal set is produced without them.

Federal radio sets are built with two thoughts in mind—first: simplicity of operation, but three controls being necessary—second: special controls for refinement if the user is interested in reproducing all the beauty of tones that fill the air.

"Lovers of good music" know why Federal is better, and know the real value of the refinement placed at their command to make it easy to obtain the clearest tone reception.

FEDERAL TELEPHONE & TELEGRAPH CO.
Buffalo, N. Y.



Federal

Standard RADIO Products.

Boston
New York
Philadelphia
Chicago
Pittsburgh
San Francisco

Bridgeburg
Canada
London
England

Look for this sign



Coto

"Built First to Last"

Audio Amplification at a Popular Price

The volume and clearness of amplification of this HALF PRICE transformer is always a pleasant surprise to users. Many have written us that they prefer their 3 to 1 ratio Coto Specials to others selling at double the price.

Great for reflex circuits. Type 4500..... \$2.50

If your dealer fails you, write us, giving his name and address, and list of Coto parts you need.

COTO-COIL CO.

87 Willard Ave., Providence, R. I.

BRANCH OFFICES:

Los Angeles, 329 Union League Bldg.; Minneapolis, Geo. F. Darling, 705 Plymouth Bldg.; Atlanta, C. P. Atkinson, Atlanta Trust Co. Bldg.; CANADA, Perkins Electric Co., Ltd., Montreal, Toronto, Winnipeg.



OPERATION, TROUBLES

(Continued from page 7)

ever, if a station at any great distance is being tuned in, its presence will be denoted by a whistle. This whistle may be eliminated and the music or speech brought in clearly by the proper adjusting of dial number 2.

After the station is heard, readjust dial number 3 so as to find the best point. In some cases dial number 3 may be used to clear up the signal. Always keep dial number 3 as near zero as possible, as burning the tubes brighter than necessary only shortens the useful life of the batteries.

Main Sources of Trouble

Do not ever overlook the fact that your Radio instrument is similar to your automobile. Little things will go wrong that are very exasperating, and yet easily fixed by anyone who knows how.

The first place to always look for trouble is in the batteries. No instrument has any power in itself, and must depend on the batteries to push the signal through. Don't expect too long life from batteries. Poor battery connections are the next main source of trouble. Look these over carefully. Make sure that each is tight and on the right post.

Springs in the sockets must make contact with the prongs of the tubes. If the springs which make connections to the A battery do not make contact with the prongs of the tube, it will not light. If the same occurs in the B battery, you may receive a signal, but very weak. A broken filament in the tube will sometimes give results, but with a great deal of noise.

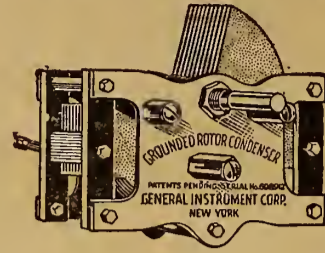
The A battery connected up wrong, possibly the yellow wire where the red wire should be, will cause a very weak signal. Do not overlook the fact that both A and B batteries will wear out even when the instrument is not in use. If your signals are weak, always look to your batteries, because no instrument has any power in itself, and must depend on the batteries for volume.

If the tube will not light or lights at various places on the rheostat, take off the arm and bend it to make a better contact.

See that your phones are tested, so that the trouble is not in the phone, which very often happens, especially with the cheaper grades of phones now on the market. To look over the wiring of the instrument, unfasten the four screws in

(Continued on page 16)

HEAR THE DIFFERENCE!



THE LOW LOSS GENERAL INSTRUMENT CORPORATION GROUNDED ROTOR CONDENSER

Laboratories use it because actual tests have proved that dielectric losses have been practically eliminated. This makes it possible for your receiving set to surprise you with new power.

Based on Greater Selectivity, More Distance and a Remarkable Increase in Volume

Replace your old condenser with the New Low Loss Grounded Rotor Condenser and *hear the difference.*

Type	Minimum	Maximum	Price
Type 46X 11 Plate	5 MMFD.	.00025 MFD.	\$4.50
Type 46A 13 Plate	6 MMFD.	.0003 MFD.	4.50
Type 46D 21 Plate	9 MMFD.	.0005 MFD.	5.00
Type 46F 43 Plate	15 MMFD.	.001 MFD.	5.50

AT YOUR DEALER

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

GENERAL INSTRUMENT CORP.

423 Broome Street
NEW YORK CITY



NATURE-TONE

Nature's Gift to Radio

The price is \$5.00 for the standard 17 inch size and 50c per additional inch up to 30 inches, post paid to any part of the U. S.

GULF IMPORTING CO.

LORRAINE ARCADE
MIAMI FLORIDA



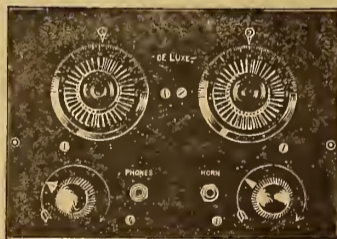
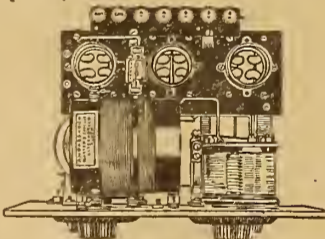
RADIO'S PROVEN MASTERPIECES

THE NEW DE LUXE AMBASSADOR

\$27.95 C.O.D.

More than 11,000 sold since first advertised a few weeks ago. See previous advertisements in "Radio Digest." Send for big handsome descriptive circular FREE, showing selectivity and DX tests, reports, etc.

- SET CONSISTS OF**
- 1 DRILLED 7 x 10 Radion Mahogany Panel, engraved in Gold.
 - 1 Genuine Ambassador Master 3-Circuit Litzendracht Tuning Coil.
 - 1 Genuine Comsco Bakelite-End Condenser.
 - 1 Triploid Mounting Socket.
 - 2 Premier Hegehog Audio Transformers
 - 4 Brunswick Under-slung Foundation Brackets.
 - 2 Brunswick Jacks with Gold-Plated Fronts; 1 for phones; 1 for loud speaker.
 - 1 Freshman Mica Grid Condenser.
 - 1 Standard Glass-Enclosed Grid Leak.
 - 2 30-Ohm Shackton Bakelite Rheostats.
 - 2 Moulded Mahogany Dials grained to match panel.
 - 5 Lengths Professional Round Bus-Bar.
 - 1 Set of 7 Moulded Engraved Binding Posts completely mounted.
 - 1 Special Blue Print for this circuit. Not an ordinary hook-up, but in clear picture form child can understand and make. Assembled ready to wire, and packed in handsome box, complete.



- ACCESSORIES**
Everything needed to operate after building is listed here—
- 3 Type 201-A Tested Tubes\$11.70
 - 1 60-Ampere Hour Storage Battery\$11.25
 - 2 45-Volt Extra Large Enco "B" Batteries\$6.50
 - 1 pr. 3000-ohm Head Phones and Cord\$3.75
 - 1 Phone Plug, Double\$.90
 - 1 Antenna Equipment\$1.50
- Complete outfit, \$35.60 (Parts Also Sold Separately)

SPECIAL BUILDING KIT FREE
Order Building Kit and Accessory Outfit both together, and we will send Fine Mahogany Finish Cabinet FREE.

Fits Snugly Behind a 7x10 PANEL SHIPPED TO YOU AS A COMPLETE 3-TUBE PORTABLE ASSEMBLY ALL READY TO WIRE All Mounted Like Picture

SPECIAL SUIT CASE CABINET

Space for set, "A" and "B" Batteries and Antenna. Covered with fine automobile leather Fabrikoid, reinforced corners, handle, special convenient doors. A truly elegant, high-class affair that you will delight to own. Additional—

\$12.00

The RADIO-SHACK

LARGEST RADIO DEALERS IN AMERICA

Broadcasting Regularly from Our Own Studios Through Station WHN

Executive Offices, Dept. RD719, 55 VESEY ST., NEW YORK CITY

Every Article Sold on WRITTEN Money Back Guarantee

The De Luxe NEUTRODYNE

Now again you can buy this GREATEST of Genuine Licensed Hazeltine 5-tube Neutrodyne which we recently stopped advertising because the Special Parts necessary for perfect synchronization could not be secured fast enough to supply our orders. A new edition of FREE illustrated descriptive circulars is now ready. Send for your copy.



\$34.49 C.O.D.

WHAT THIS GENUINE STANDARD SET CONSISTS OF—

- 1 Drilled Mahogany Panel, polished mahogany effect, engraved in gold.
- 3 Four-inch Mahogany Dials, gold engraved.
- 2 Gold Plated Jacks.
- 3 Genuine Hazeltine Neutrodyne transformers mounted on the famous Comsco-Bakelite End Condensers. Positive-ly the only Neutrodyne Kit including them.
- 2 Hazeltine Neutrodons.
- 5 Heavy Bakelite Sockets.
- 1 6-Ohm Rheostat with gold plated knob to match panel.
- 1 30-ohm Rheostat with gold plated knob to match panel.
- 2 Genuine Killark Completely Shielded Audio Transformers.
- 1 Baseboard.
- 20 Feet Tinned Bus-bar.
- 1 .00025 Freshman Grid Condenser.

- OPERATING OUTFIT**
- 5 Tested Tubes (Type 201A).....\$19.50
 - 2 45-Volt Extra Large Variable "B" Batteries for Neutrodyne 6.50
 - 1 60-Ampere Hour Storage Battery, guaranteed 2 years..... 11.25
 - 1 pr. 3000-ohm Head Phones and Cord 3.75
 - 1 Phone Plug, double..... 90
 - 1 Antenna Equipment..... 1.50
- Complete Outfit, \$43.40, C.O.D. (Parts Also Sold Separately)

If you order Building Kit and Operating Outfit both together, we will include Fine Mahogany Finish CABINET FREE.



Send No Money

We ship C. O. D. When shipment arrives pay your postman. Then enjoy your purchase under our WRITTEN MONEY-BACK GUARANTEE. Remember, you buy SAFELY from The Radio Shack, the Largest Radio Dealers in America—built upon Quality, Service, Value and the universal Respect and Confidence of the radio public.

4 Big Specials: Fada 160

Factory Built Sets with Serial Numbers LIST \$120

\$84

FREED-EISEMANN NEUTRODYNE KIT LIST \$24

Now \$19.50

Fada 120

Genuine 5-Tube Kit LIST \$63.25

GENUINE V.T. 2

\$6.50

cast

7LS,

IAH,
VGI,

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uthern or-
m., Radio
l., musical
n., chimes;
ers, Palmer
service; 9:30,

Daylight, 509), 2:25
temple; 3:15, Clarence
vices, Bethany Temple,
360), 11 a. m.-12:30
of Christianity; 7-7:45
of Christianity; 8-9
e Methodist Episcopal

ral, 440.9), 8 p. m.,
; Missouri State Prison

ight, 448), 8-10 p. m.,
bo Gardens orchestra;

17), 11 a. m., services,
2 p. m., Detroit News
rt band.

ily 21

Daylight, 425), 1:45
oyal Hotel; 4:15, music.
fic, 469), 8-9 p. m.,
e orchestra; 9-10, Ex-
ssador hotel Cocoonut

15), 8:30 p. m., Babb's

312), 3 p. m., studio
y Halstead's Hotel St.
ational program.

2), 3:30 p. m., literary
oclation; 8-10, pupils,

ific, 395), 12:30-1:15
d Rendezvous bathroom

Daylight, 270), 5-5:30
ry of Snubs our Dog;
ue, Ben and Thelma
soprano; Indra Hesh,
accompanist; artists
olph.

ight, 536), 11:35 a. m.,
rson; 6:45 p. m., bed-

, 360), 7:30-9 p. m.,
onic dance orchestra.

ntial, 417), 12:30-1:30
olst; 9:30-11:30 p. m.,

423), 12 m., Ila Lor-

, 266), 8 p. m., musical
proof Hosiery company;
berle, banjoist; Harold
e, Frieda Stoll, soprano.
ight, 345), 3 p. m.,
Newcomer and Mason;
Klawonn; Mrs. J. D.
baritone; E. B. Pax-
n, reader; Ruth Petrie,

7), 4:15 p. m., musical
3:30, musical program,
Cafe orchestra; Meyer
Ingham, soprano; C. A.

ntial, 411), 3:30-4:30
5-5:30 p. m., weekly
by the Kansas City
the air, piano tuning
address, Clay Harvey,
on education; address,
of Kansas; children's
music, Carl Norberg's
bach; 8-9:15 p. m.,
Ho orchestra with the

stern, Daylight, 395),
2 p. m., Stanley theater
ife concert orchestra; 2,
4:30, health talk, Mrs.
ddy's bedtime stories;
ames A. Nassau; 8, Ar-
1:30, Stanley Symphony
rector; 10, Arcadia cafe

n, Daylight, 492), 4:30-
prano; 5-5:30, women's
Waldorf-Astoria hotel;
contralto; 8-8:15, Hinz
; 8:30-10, Marine band

rn, 360), 1:30 p. m.,
Ohio State university

stern, Daylight, 395), 1
venue Stratford concert orches-
pianist; 6, Sunny Jim, the kid-
eaver Davis Bellevue Stratford con-

cert orchestra.
WGR, Buffalo, N. Y. (Eastern, Daylight, 319), 12:30-1
p. m., George Albert Bonchard, organist; 6:30-7:30,
dinner music; 9-11, concert, QRS Music Roll company,
direction of "Bob" Hollinshead; 11:30, Vincent Lopez
Hotel Stadler dance orchestra, direction of Harold
Gieser.

WGY, Schenectady, N. Y. (Eastern, 380), 7:45 p. m.,
Ethel E. Osterhout, pianist; Leonard V. Grant, bar-
itone; Ralph H. Steele, tenor; "Byesight and Motor
Car Drivers," Claud M. Hall.

WHAS, Louisville, Ky. (Central, 400), 4-5 p. m.,
Alamo Theater orchestra; Dick Quinlan's Golden Derby
orchestra.

WHZ, Troy, N. Y. (Eastern, 380), 9 p. m., Marshall
Athletic club; popular songs; Dorothy Donohue p. m.,
address; children's story; music.

WHN, New York, N. Y. (Eastern, Daylight, 366), 2:15-
2:30 p. m., Jimmy Clarke and his entertainers; 2:45-3,
Harry Hock entertainers; 3-3:15, L. Wolfe Gilbert,
songwriter; 3:45-4, Leon Stein, baritone; 4-5, Nathan
Frank's Hotel McAlpin Tea orchestra; 5-5:30, Leonard
Partridge's Mayflower orchestra; 6-7, at the Alamac
festive board; 7-7:15, Roemer sport period, Thornton
Fisher; 7:30-8, Roseland dance orchestra; 8-8:30,
people's popular concert, Marla Schupac; 8:45-9,
Vincent Lane, Irish tenor; 9-9:30, Chas. Strickland's

(Continued on page 12)

M.C.
KAC,
KYW,
WJZ,
IAQ,
WWJ.
TES
KGO,
the
Back."
DAR,
Green-
VDAR,
WGY,
of the
WGY
ers.

recital, Ray Reid Brignall, 6:30-7:30, "Kozy hour,"
junior crusaders; Gertrude Wildine, child soprano;
pre-view, International Sunday School lesson, Mother.
KGO, Oakland, Calif. (Pacific, 312), 8 p. m., Southern
Pacific orchestra; Consuelo de Laveaga, soprano; Jo-
sephine Holub, violinist; Lyman L. L. Brenner, cor-
netist; Wesley Parks, tenor; Arion trio; Olan P.
Brooks, tenor; "Transportation," C. J. McDonald;
Beth Miller Porter, soprano; H. E. Hunt, reader;
"Safety First," J. B. Monahan; Helen Blake, pianist;
Georgia Minstrels; George Schuler, tenor; 10-1, Hotel
St. Francis dance orchestra.
KGW, Portland, Oregon (Pacific, 492), 3 p. m., chil-
dren's musical program; 10, dance music, George
Olsen's Metropolitan orchestra.
KHJ, Los Angeles, Calif. (Pacific, 395), 2:30-3:30 p. m.,
Hollywood Bowl program, Mrs. J. J. Carter, director;
6-6:30, Art Hickman's Concert orchestra; 6:45-7:30,
children's program, Prof. Walter Sylvester Hertzog;
bedtime story, Uncle John; 8-10, program, Mrs. J. L.
Hunter, director; Julio Kellar, harpist; 10-11, Art
Hickman's dance orchestra.
KPO, San Francisco, Calif. (Pacific, 423), 8-12 mid-
night, Art Weidner and his popular artists; songs,
KPO trio.
KQV, Pittsburgh, Pa. (Eastern, Daylight, 270), 9-10
p. m., regular artists' evening program.
KSD, St. Louis, Mo. (Central, 346), 8 p. m., Missouri
Theater orchestra and specialties.

a. m., seashore gossip; 3, "What the wild waves are
saying"; 3:30, Comfort's Philharmonic orchestra; Loda
Goforth, soprano; 6:05, Kentucky Seranaders dance or-
chestra; 7, Uncle Wip's bedtime stories; 8, Comfort's
Philharmonic orchestra; 8:45, "What the wild waves
are saying"; 8:50, Vessella's concert band; 10, Bob
Leman's dance orchestra; 11:05, Karl Bonawitz, or-
ganist.
WJZ, New York, N. Y. (Eastern, Daylight, 455), 4:20-
4:30 p. m., "Who Can Make Good in the World's
Metropolis?," Walter T. Diack, New York Y. M. C.
A.; 5-5:30, Clementine Rigo, soprano; 7-8, Waldorf-
Astoria orchestra; 8-8:15, "The Radio Telescope of
Directional Receiving," Dr. Alfred Goldsmith, Chief
Broadcast Engineer of R. C. A.; 8:25-10, Stadium
concert, N. Y. Philharmonic orchestra; 10:30-11:30,
Paul Specht's Club Lido Venice orchestra.
WLAG, Minneapolis-St. Paul, Minn. (Central, 417), 7:30
p. m., business message; 8:15-10 p. m., band concert,
Lake Harriet, Minneapolis, Minn., direction Engelbert
Roetzgen; 11-12 m., dance program, Geo. Osborn's
Nicollet hotel orchestra; Wendall Hall, soloist.
WLS, Chicago, Ill. (Central, Daylight, 345), 8-1 a. m.,
national barn dance, Iowa Farmers Union Fiddlers'
team.
WMAQ, Chicago, Ill. (Central, Daylight, 370), 6:30
p. m., Hotel LaSalle orchestra; 8, band concert,
Chicago Rapid Transit band; 9, weekly Balaban and
Katz Chicago theater revue.

p. m., services, Linwood Boulevard Christian church,
Dr. Burris Jenkins, pastor; 8-10 p. m., services by
representative churches of Kansas City at Indian Vil-
lage town hall.
WHK, Cleveland, Ohio (Eastern, 283), 6 p. m., chapel
service, auspices Cleveland Federated churches; 8 p. m.,
concert program.
WHN, New York, N. Y. (Eastern, Daylight, 366), 9:30-
9:45 p. m., "Why You Are Interested in Europe,"
Janin Seth Morse; 9:45-10, Alfred Dulin, pianist;
10-10:15, Walter Kelly, tenor; 10:15-10:30, Shakes-
peare recital, James O'Connell.
WIP, Philadelphia, Pa. (Eastern, Daylight, 509), 7:30
p. m., services, Holy Trinity church, Rev. Floyd W.
Tompkins, D. D., rector; 9:30, special Sunday evening
concert, Steel Pier, Atlantic City.
WJZ, New York, N. Y. (Eastern, Daylight, 455), 9-10
a. m., children's hour; 11-12, services; 8:30-10 p. m.,
Stadium concert, N. Y. Philharmonic orchestra.
WLAG, Minneapolis-St. Paul, Minn. (Central, 417),
10:20-12 m., morning service, Plymouth Congregational
church; 4:15-5:40 p. m., service, House of Hope Pres-
byterian church; 7:45-9 p. m., service, Central Lutheran
church.
WLS, Chicago, Ill. (Central, Daylight, 345), 6:30-8
p. m., Sears-Roebuck orchestra.
WLW, Cincinnati, Ohio (Central, 423), 9:30 a. m.,
Editorial staff of Sunday School publications, Metho-
dist Book concern; 11, services, Church of the Covenant,

cert orchestra.
WGR, Buffalo, N. Y. (Eastern, Daylight, 319), 12:30-1
p. m., George Albert Bonchard, organist; 6:30-7:30,
dinner music; 9-11, concert, QRS Music Roll company,
direction of "Bob" Hollinshead; 11:30, Vincent Lopez
Hotel Stadler dance orchestra, direction of Harold
Gieser.
WGY, Schenectady, N. Y. (Eastern, 380), 7:45 p. m.,
Ethel E. Osterhout, pianist; Leonard V. Grant, bar-
itone; Ralph H. Steele, tenor; "Byesight and Motor
Car Drivers," Claud M. Hall.
WHAS, Louisville, Ky. (Central, 400), 4-5 p. m.,
Alamo Theater orchestra; Dick Quinlan's Golden Derby
orchestra.
WHZ, Troy, N. Y. (Eastern, 380), 9 p. m., Marshall
Athletic club; popular songs; Dorothy Donohue p. m.,
address; children's story; music.
WHN, New York, N. Y. (Eastern, Daylight, 366), 2:15-
2:30 p. m., Jimmy Clarke and his entertainers; 2:45-3,
Harry Hock entertainers; 3-3:15, L. Wolfe Gilbert,
songwriter; 3:45-4, Leon Stein, baritone; 4-5, Nathan
Frank's Hotel McAlpin Tea orchestra; 5-5:30, Leonard
Partridge's Mayflower orchestra; 6-7, at the Alamac
festive board; 7-7:15, Roemer sport period, Thornton
Fisher; 7:30-8, Roseland dance orchestra; 8-8:30,
people's popular concert, Marla Schupac; 8:45-9,
Vincent Lane, Irish tenor; 9-9:30, Chas. Strickland's
(Continued on page 12)

30 Minute A-B-C Lessons for Radio Beginners

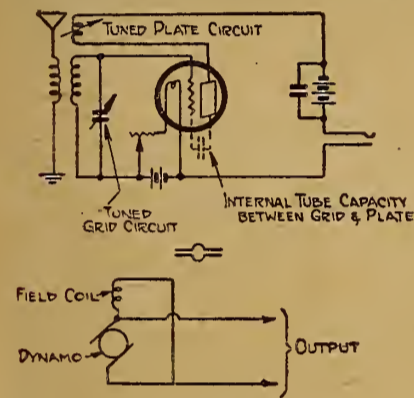
Chapter XVIII, Part I—Hero Circuits of Radio

By P. E. Edelman

IN THIS series of articles the story of Radio is told in so simple a manner that the uninitiated can follow theory and practice whether or not he knows anything about electricity or its application to broadcasting and reception. The series consists of twenty-five chapters, of which the five next will be:

- Chapter XIX—What is Doing in Complicated Circuits.
- Chapter XX—How Far Can I Hear?
- Chapter XXI—Choosing a Radio outfit.
- Chapter XXII—Making Your Own Radio.
- Chapter XXIII—Fixing Up the Radio Set.

A RADIOCAST listener may well wonder where the Greek name circuits come from. Says one, "Old man DeForest started it by calling the vacuum tube 'Audion'." Someone decides



REGENERATOR
Figure 166

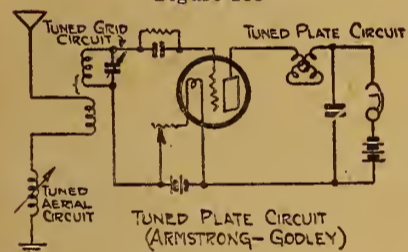
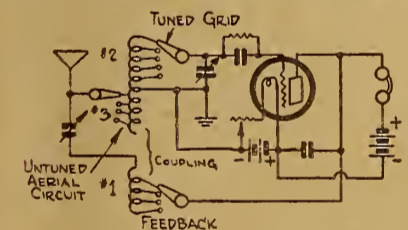


Figure 167

that "dyne" would sound nice on a new variation, and, so a whole family of "dyne" circuits is begotten. Some of the "dynes," "flexes," etc., would hardly recognize their third cousins of the tribes, so



REINARTZ REGENERATOR
Figure 168

the average listener soon decides that the name is less important than the

PRE-AMPLIFIER

Registered



Makes Summer Radio Practical

THE TWITCHELL PRE-AMPLIFIER is a powerful Radio Frequency Amplifier attachable to any receiving set. It brings in many distant stations which you cannot hear without it. Brings in with tremendous volume those you now hear only faintly. Makes your set selective. Prevents re-radiation.

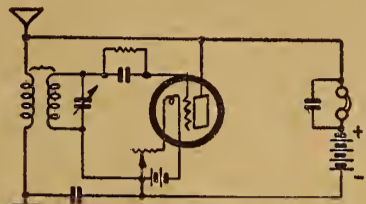
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Shipped Prepaid

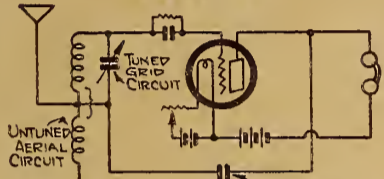
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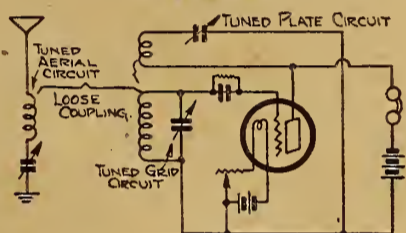
"works." Another flock of so-called "hero" circuits are named after the designer who happens to publish a circuit. Some writers make sarcastic remarks about



SINGLE CONTROL REGENERATOR (RE-RADIATES)
Figure 168A



CONDENSER REGENERATOR
Figure 169

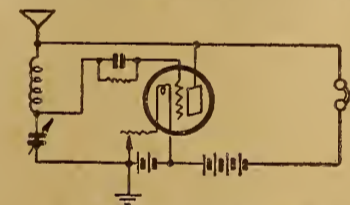


ARMSTRONG-WEAGANT FEEDBACK
Figure 170

such circuits, systems, etc., as are much press agented or trade advertised, but this is hardly polite. They will tell you for example that the popular Reinartz circuit is nothing but a regenerative hook-up, but overlook the fact that numbers of users regard it as an improvement. The much discussed Armstrong circuit could in the same manner be called, "just another audion circuit."

Regeneration

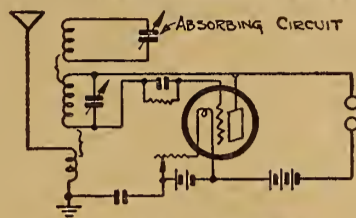
Regeneration as an electrical principle is very old, dating back to the days of



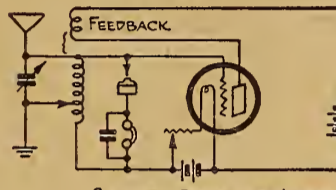
ULTRA-AUDION (DE FOREST)
Figure 171

Joseph Henry. The usual dynamo employs regeneration in building up a magnetic field when the armature sends a weak current through the field to react on the armature, etc. etc., over and over

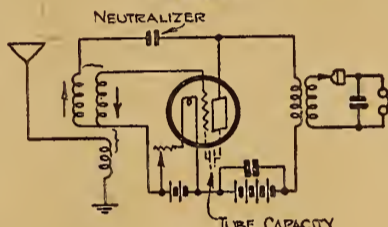
again until the field attains full strength. The howling or singing microphone formed by putting a receiver against a telephone transmitter comprises regenera-



AUSTIN-ABSORBER
Figure 172



CRYSTAL DETECTOR ADDED
Figure 173



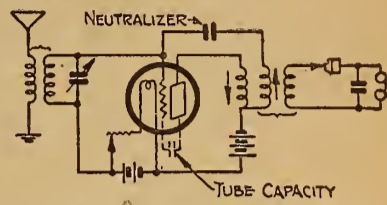
RICE NEUTRALIZER
Figure 174

tion. Regeneration itself is a principle of nature.

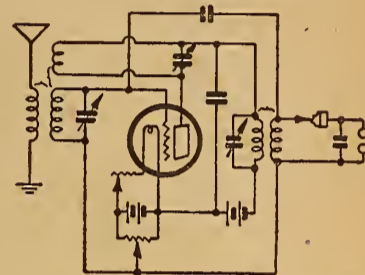
One Tube Circuits

So there is a legitimate field for attempts to improve Radio circuits by new combinations of principles and means. Some of the possible combinations as well

as principles in use in various popular circuits will now be pointed out.



HAZELTINE-JONES NEUTRALIZER
Figure 175



TUBE CAPACITY NEUTRALIZED
Figure 176

What One Tube Can Do

Probably many listeners have wondered why a single tube could not perform all the functions of a series of tubes. Why not amplify, detect, amplify, etc., all with one tube? There is no theoretical reason why not, except the capacity of the tube and the difficulty of arranging non-interfering circuits in correct phase relation. Aside from the cost of the tubes and the upkeep, boiling down of the number of tubes is no special advantage, unless simplicity results.

Figure 166 indicates a typical regenerative receiver with an equivalent dynamo circuit. Feed back can be inductive or capacitative coupling. Such a receiving circuit can be made to radiate energy.

(Continued on page 16)

"What a whale of a difference just a few cents make!"



— all the difference between just an ordinary cigarette and—FATIMA, the most skillful blend in cigarette history.



Thinking Radio?

Then Get Our FREE Bulletin No. 92

It shows recent developments and improvements in parts and the kind you must use if you want the best in Radio. Send for this book today.

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Service Demanded

Live Manufacturers Provide Maintenance

NEXT step in the development of Radio includes greater attention to service in connection with the making and operation of sets. Service is as important to Radio as service and service stations have been in the development of the automobile industry, and in time will have an important effect on the Radio industry.

The extent of research and service work now done by leading manufacturers of Radio apparatus is not generally realized. Progressive Radio manufacturers who have established their business on a permanent basis, realize that to keep abreast of developments in Radio, and to make a product which will give service and satisfaction, they must maintain efficient engineering and research departments.

Now, more than ever, the public is demanding service. It has a right to, and a great many manufacturers and dealers are enlarging and strengthening their facilities to provide it.

Will Atoms Run Our Radios?

Notable Scientist Tells of Enlarging Infinite Power

ATOMS and the atomic structure have come to the attention of the Radio engineers so much of late that it is interesting to note what one distinguished English scientist, Dr. F. W. Aston, has to say on the subject of the power contained in these atoms.

"It is practically a certainty, he remarked, that four neutral atoms of hydrogen gas weighs more than one neutral atom of helium gas, though they contain the same fundamental units. If we could transmute four atoms of hydrogen into one atom of helium, matter would be destroyed. This would release an almost inconceivable amount of power. A pint of water, could the hydrogen in it be converted into helium, would propel the Muretania across the Atlantic and back at full speed. A half a drop of water inside a vacuum tube would operate the tube, without batteries, for several human life times."

Now, if some inventive genius would only step forward with some arrangement for converting hydrogen into helium he could command the wealth of the world. Will it be you?

Aid to Daily Papers

Recent Political Conventions Proves Radio's Worth

THE first Radiocast of a national political convention brought Radio into some newspaper offices where it had never before penetrated. It is said to have been of value to the managing editors in two ways: First, that it actually beat the press wire reports by about two minutes; and second, it enabled the managing editors and make-up men on duty at home offices, to anticipate stories and keep in touch with the actual spirit of the convention, probably better than reporters on the scene busy writing stories.

The editor of a leading daily had a Radio receiving set on his desk and directed the make-up of his paper while he listened in to the convention, from the actual platform, as it were. He could feel the pulse of the sessions. He was able to get the "feel" of the convention. He secured a definite line on the spirit of the applause at each nomination speech, as well as outbursts following the casting of the votes by delegations, and judged for himself whether or not the cheering and applause were manufactured, inspired or spontaneous. This was a sidelight editors who remained at their desks never could secure before, and it was valuable, making possible better editing and follow-up stories. Radio brought in an additional story, one correspondents could not write.

Some Radiophans feel that Radio has eliminated the need for extra papers, but on the other hand, the Radio announcements carry bare facts without interpretation. Radiocasts are gone in a moment, whereas the papers are longer lived and carry news and features, follow stories and views of authorities which do not come over the Radio. All of which make the extra or the next issue of the paper all the more interesting and necessary to the Radiophan.

RADIO INDI-GEST



An Adventure in Honolulu

I live down here, a Yankee,
As comfy as can be
And if you read this "pome,"
You'll see what's troubling me.
'Twas midnight on the ocean;
Not a street car was in sight.
My set was working extra fine
So I stayed up that night.
I looked out o'er the water,
As black as it could be;
But all that I could think of
Was my Radio set and me.

I kissed my wife a nice good-night
When she went up to bed,
Then sat down by my Radio,
With fones upon my head.
I turned the dials here and there
Trying to catch some sound,
But learned to my great despair
That nothing could be found.

I gave the set an awful hit,
I thought 'twas me for bed;
But that was when I did my bit,
For this is what was said:

"This is Station XPQ, Honolulu,
"The last selection broadcast
"Was, 'Don't Let 'Em Fool You'
"These shimmyers are sure fast!"

Oh boy! Where's my log book.
That's a new one all right!
Numbers 10-16-30, taps 2-8.

I'll sure know those on sight!
Hello—what did he say then?
Shimmy once! Shimmy twice!
A selection by Alto McBen?
Shimmy while they throw the dice!

This is the sad part, about to come. Give me a swag o' that there rum.

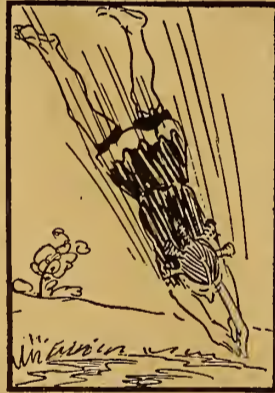
"How was that selection my friends? You have just heard Ahron Hershey demonstrate what it sounds like to hear Honolulu. WJZ, AJN announcing. This is WJZ signing off at 10:30, from Aeolian Hall, New York City."

Wifey calls down, "It's time for bed deary. What did you hear tonight?"

Hubby calls up, "I'm com'in! Tell you tomorrow. Good-night." H. W. S.

Mrs. Partington Speaks Out

Dear Indi: Mizz Partington says maybe she ought to apologise to Wendell Hall for having accused him of being a false Prophet on account of his weather report, "It aint goin to rain no mo," for she knows now what he meant. It aint going to rain no more because it can't, its done rained all it could, only missing five days out of the last forty, but she wants to beg him to use his influence right away to stop it and get us some Sunshine, or she may have to get him investigated by Gasston Be-mans and our Bullshevik senate committee to make him behave hisself or dry up. She thinks some of them delegates who are down to Cleveland, this week, had better be looking for a dry place, too, as this part of the country aint going to vote for nothing that even sounds wet.



SIGNING OFF.

You Can't Fool the Public. Oh, No!

Dear Indi: Do you think if I started a fourth party with a platform promising to eradicate static, that I would have a chance of winning? Down south here where there's so much static we use the loud speaker for aging home brew. Showing off my set the other night when the atmos-"fearics" prevailed, the sweet young thing remarked, "About all you get is a rumor." W. B. P.

The Prof. Is Okeh; Your Batteries Must Be Dead

Dear Indi: Why can't I get KOP and the other stations on my receiver? Mine is extremely simple. I only use 13 tubes. It was perfected by Prof. Hoozzle-goozle, of Shingle Circuit fame. The Prof. calls it his Super-Hindoormoonodyne. He confesses that it is better than his famous Shingle Circuit, and in his directions to me, said that about 70 volts would be about enough on the filaments. After putting 70 volts on the 13 tubes, I found they didn't even light. I think the Prof. is a humbug and should explain this through your column. SAFFRON.

Roll Call: Micro Farads, Soozzee, Cactus Jack, Burt B. B., Blew A. Bottle, Ins U. Lation, Rheo Stat, Elsie, 2 Punk, Mama Haymes, Squibblabliblum, Pushometer, H. Ed Fones, Dit-Dah Dit-Dah, Eddy Currents, C. B. Attery, Jack—on the job! We're going to have a beach party without portable Radio sets sometime soon for all our valueless contrib mfrs. The invite will be published.

The Last Straw



Condensed

By DIELECTRIC

These political conventions "on the air" should result in a public demand that they be made to conform to rules governing all other Radio entertainment. Under other circumstances, the Cleveland affair would have resembled that in New York, in that much good time is used in marching about the hall every time a man is put in nomination—a feature which listeners cannot see; another wasteful process being the seconding with long speeches by every delegate desirous of being heard. It's very useful to Radiocast these proceedings so millions who never attend may fittingly criticise and perhaps improve them.

Station KFI in Los Angeles, is preparing to establish itself among the really big stations in the country. It has succeeded in reaching the Atlantic coast with its programs during the winter months, but with the new equipment, utilizing five kilowatts upon demand, there can be little doubt of better reception after the changes are made. The expense of improving the station and maintaining it will amount to considerable, although Earle C. Anthony believes his company will be remunerated for the outlay. It will be in a class with WEAJ by November.

Many of you remember the fate which seemed in store for KFIQ, Radiocast station in Yakima, Wash., before the Radiophans came to the rescue last winter, when it appeared inevitable the station must fade out. You also recall that the response of these same fans gave it new life and enabled it to continue—until now. Confidence in the plan of operation is not destroyed, I am sure, because it failed to work in this instance, for the immediate cause lies at the door of King Telephone. Under certain conditions the same thing could happen anywhere.

For some time past I have been hearing about a new loud speaker to appear which would put all others out of sight! It is here now and you may judge of its superiority by visiting the automobile tourists' camp grounds at Schenectady, N. Y. This invention of Dr. Hewlett, physicist of the research laboratory of the General Electric company, is known as an induction speaker and requires no horn. Aside from the fact that sound is emitted from both sides, the most distinguishing feature claimed for it is the natural quality of tones reproduced. Loud speakers bear improving and it is to be hoped that this one does more nearly approach the ideal, but if not, then another will sooner or later.

Fortunately for lovers of classical music who can tune in WJZ, concerts given by the New York Philharmonic orchestra will be on the air now thrice weekly until the close of the season toward the end of next month. These concerts come direct from the Lewisohn stadium in New York city. During the past seasons that the programs of this orchestra have been Radiocast, thousands have availed themselves of the privilege of listening to one of the foremost musicale organizations in the country. Many reserve the evenings devoted to this feature throughout the season, just as they would had tickets been secured for the stadium.

I am wondering if there is anything under the sun which the famous Lloyds of London would be unwilling to insure. It is said that Harold Lloyd, known to movie fans, had insurance with this big company to meet the untoward appearance of twins in his family. It worked in that case. Now Lloyds holds an insurance policy for \$50,000, protecting Ernie Young's Revue against static or SOS calls silencing its Radiocasts from Dreamland park, Newark, N. J., sent through Radiocast WOR.

England's New Unidyne Radio Receiver

Part II—Amplifier Hook-Up and Two-Tube Set

By Harry J. Marx

THE introduction of the new unidyne circuit in conjunction with its use of the four electrode tube to the Radiophans of England, has been the direct cause of considerable controversy between the various English magazines on the subject of the practicability of the scheme and its relative merits. Since both inventors, Mr. G. V. Dowding and

type—about three to one. The one used in the English circuit has 4500 turns of 40 gauge enameled wire in the primary and 11,000 turns of the same wire in the secondary winding and is equivalent to about 2½ to 1 ratio. The core should be made of good laminated steel about 5 mils in thickness. Each lamination should be shellaced so as to reduce eddy current

4. This hook-up has the detector and one stage of audio frequency amplification with a switch to permit the use of the detector stage only if desired. The only real change from the original circuit is the elimination of the high ratio transformer which was used to add a second regenerative feature. It will be recalled that in describing this feedback it was

for tuning but the vernier type is recommended.

A variable grid leak is an important requirement for the outer grid circuit of the first tube. The same recommendations as given for the transformer in the amplifier unit described above, apply for the audio frequency transformer used in this circuit. One rheostat is used for the

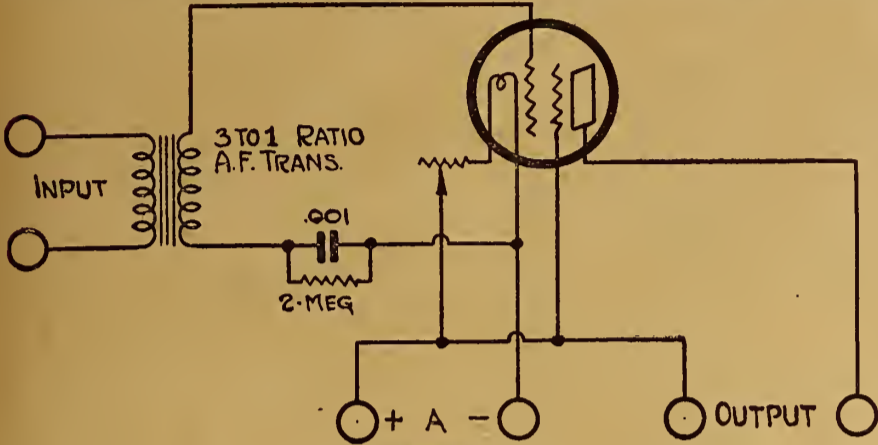


Figure 3

Mr. K. D. Rogers, are members of the staff of the English magazine Popular Wireless Weekly, which is presenting the details and developments to the fans, competing publications have been running series of articles and comments by recognized authorities on the subject. Although the invention of the circuit has been disparaged and even claimed old stuff, yet all appear to have room for conviction in order to be on the safe side.

Then again, tests by other authorities indicate that tube for tube the circuit compares favorably with any using B batteries. It must be remembered that the claim is the elimination of the plate batteries. As has been said, there undoubtedly will be considerable experimental development of new circuits in connection with this tube. In the next article of this series, a Radio frequency amplifier will be presented.

English fans are able to devote considerable time to experimenting with the circuit due to their opportunity of purchasing these tubes. In this country we are more or less compelled to look on and wait patiently, although efforts are being made to either import the tubes from England or to get American manufacturers to produce them.

It may be anticipated that the success of this circuit will immediately lead to the development of a lamp socket device that will automatically take care of the antenna, ground, and filament battery connections. This would be applicable to sets of any number tubes.

Audio Frequency Amplifier

The first impression appeared to be that the tube could only be used in detector circuits, but experimentation has proven numerous obvious advantages as amplifiers. Figure 3 presents the hook-up diagram of a single-tube audio frequency amplifier. This amplifier circuit can be followed for as many stages as desired.

There are a number of points to be emphasized in connection with this amplifier circuit. The audio frequency transformer used must be of the low ratio

losses to a minimum.

A .001 microfarad condenser is inserted in the grid return side of the secondary of the transformer. This is done so as to avoid putting too much of a negative potential on the outer grid. The inner grid is the one connected to the positive filament terminal. A two megohm grid leak is connected across the blocking condenser.

Two-Tube Circuit

Since a further development in the form of a two-tube circuit showed some slight variations from the original as presented in the last article, it is shown in Figure

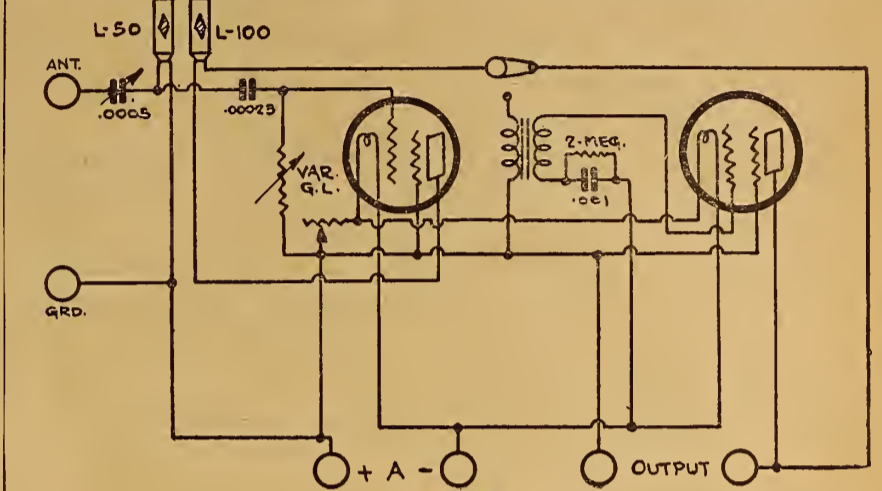


Figure 4

4 anticipated that the difficulty of control would necessitate the elimination of this second form of regeneration.

This circuit uses two honeycomb coils with a double coil mount. The main coil can be a 50 or 75 turn coil depending on the length of the antenna. Although a 100 turn coil is indicated for the tickler, it will be found advisable in some cases to increase the number of turns to 125. A .0005 mfd. variable condenser is used

control of the filament lighting of both tubes. The blocking condenser (.001 mfd.) with the two megohm grid leak is inserted in the grid return of the secondary circuit of the amplifier stage.

(In the next article a Radio frequency amplifier will be described.—Editor's Note.)

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THIRTY-MINUTE A-B-C

(Continued from page 13)

Figure 167 shows a popular type of tuned circuit. Another popular type is indicated in Figure 168, employing an untuned aerial circuit. Probably the circuits of this general kind in use today are a large portion of all the sets in the United States. The form shown in Figure 168A re-radiates, as is typical of all such circuits.

Figure 169 shows another form of such a circuit. One way to stop re-radiation is to use loose coupling between the circuits, as shown by figure 170. A sensitive capacity coupled circuit is pictured by Figure 171, and a variation of this type is shown by Figure 172.

Circuits with Crystal Detector Added

One way to add a crystal detector of the fixed type is shown in Figure 173, and other circuits utilizing the amplifying ability of one tube are shown in Figures 174, 175, 176.

Figure 174 also illustrates a well known way to neutralize the tube capacity between the filament and grid of a vacuum tube. A neutralizing condenser of small size is connected to an opposing coil so that the tendency of the tube to self oscillate is stopped.

Neutralizing Circuits

The neutralizing circuit can be in the plate circuit as indicated by Figure 175. Figure 176 indicates how tuned feedback can be employed after the tube capacity has been neutralized. The output of such circuits can go to additional stages when desired.

(Reflex combinations, link circuits, super one-tube circuits and possible one-tube circuits will continue next week.—Editor's Note.)

Keep all Radio antennas and wiring away from electric light and power wires.

OPERATION TROUBLE

(Continued from page 8)

the corners, turn the panel back and examine every wire carefully to see that there are no broken wires.

Do not forget that your results will very largely depend on your aerial and ground connections. Try and secure the very best of each that you possibly can under the circumstances.

Do not think that just because the rheostat lights the tube that you turn it on just as you would an electric light. Do not turn it on too far, because it will paralyze your tubes, and you will get no signal at all. You will quickly find out just where the proper point is.

After the aerial and ground wires have been used sometime, the wires, themselves, may break inside of the insulation. Test this by running it through your finger and thumb to see if you can locate it.

It is a good plan to try changing the tubes around the various sockets. Sometimes a tube will work better in one position in the circuit than in another.



ON ONE TUBE

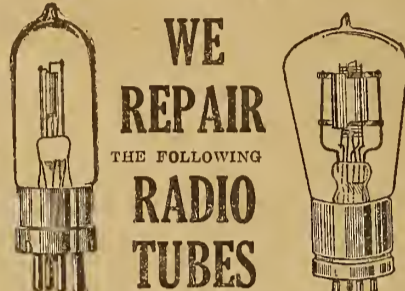
Broadcasting from Atlantic Coast, Mexico, Hawaii, Canada and Cuba heard in California by users of CROSS COUNTRY CIRCUIT. Range due to simplicity of set and only one tuning control. Easily and cheaply built by any novice. Dry cell tubes may be used. All instructions, blue print panel layout, assembly photo, etc. Postpaid 25c. Stamps accepted.

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Miladys Knitting Needle

It may seem a simple suggestion, but in my experiments I have found many uses for the common celluloid knitting needle around the Radio set. They are very inexpensive, from 10 to 15 cents each, and range in size from 1/8 to 1/4-inch in diameter and as much as 14 inches in length.

For cutting down body capacity they are just the thing for the variocoupler and variometer shafts, and for the radiating spokes of a spiderweb cell they are the "berries." By heating them slightly they may be bent to any desired shape. Be careful when heating these needles that you do not hold them near a flame. The best way to do this is to place them in hot water for a short while. Many uses may suggest themselves to the experimenter.—Arthur L. Kaser, Mishawaka, Ind.



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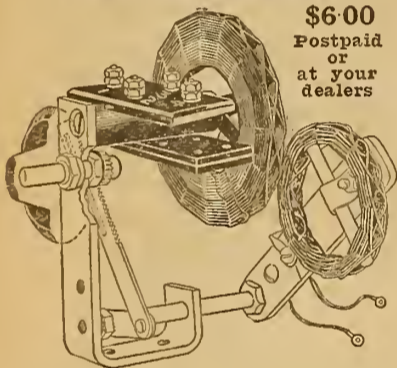
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Improving the Single-Circuit Tuner

Hook-up Suitable for Portable Receiving Set

Probably half of the homemade regenerative sets in use all over the country, as well as thousands of factory built sets, follow a diagram similar to figure 1. This will of course be recognized in-

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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.

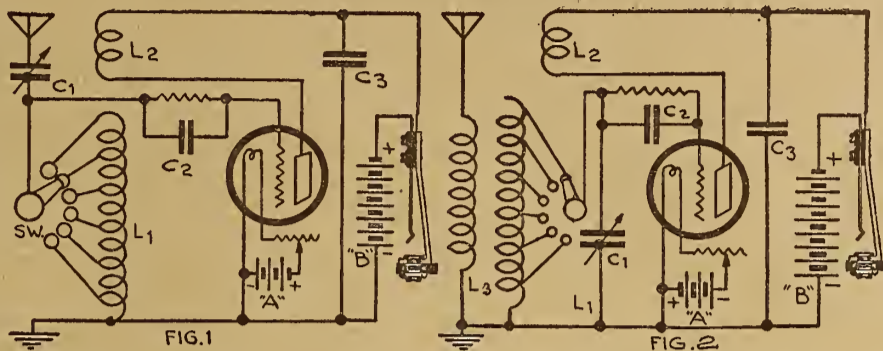
RADIO KINKS DEPARTMENT,
Radio Digest,
510 North Dearborn St., Chicago

stantly as the famous single-circuit, which has fallen into disrepute because of its faculty for radiating powerful oscillations and consequent disturbing reception over a radius of several miles.

In these days of staggered wave lengths and possibility of picking up many programs at will if one uses a sufficiently selective receiver, the broad tuning of this circuit is almost as much a detriment as its radiating properties; therefore, if wonderful improvement in selectivity can be accomplished at little or no cost and with very little trouble, the information given in this article should interest every fan—regardless of how selfish or careless one may be as to causing interference for his listening neighbor.

But the change shown in this article will do more than improve the tuning qualities of a set and remove practically all radiation—it will tremendously increase the sensitiveness of any set and

OLD AND IMPROVED CIRCUIT



give one a far greater receiving radius than the single-circuit tuner.

Referring to Figure 1, C1 is the customary tuning condenser; it may be 5, 7, 13, 17, 23, or even 43 plates—whatever the set now has will work O. K., although probably 17 or 23 plates is most desirable. C2 is the usual grid condenser; and C3 the by-pass condenser, of .001 mfd. capacity, usually. These same values are used on the circuit shown in Figure 2.

In fact, the only addition necessary is the coil L2, which consists of 5, 8, or 10 turns of any size wire from 18 to 28, wound over the old primary coil. These turns may be spaced 1/4 inch or 1/2 inch apart, and no special care need be taken in choosing the wire size; although either double silk covered or double cotton covered is preferable because of its superior insulation.

The variable condenser in the antenna circuit in Figure 1 is connected across the old primary winding, as shown, and provides the tuning element in conjunction with the switch-taps.

By being careful to connect the movable plates of the variable condenser to the ground lead, as shown, practically no hand capacity will be noticeable—even without panel shielding.

Another feature of this re-vamped single-circuit tuner is that all stations will tune in on the same secondary dial setting, regardless of the length of the antenna, because the antenna circuit is untuned.

If the reader owns a single-circuit tuner, he should not delay a moment in making this simple change; your neighbors will not only thank you, but you will certainly be agreeably surprised.

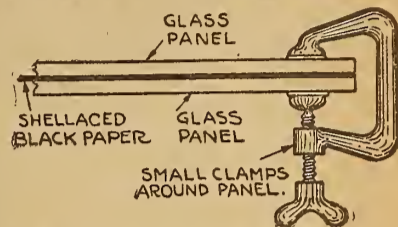
This circuit is especially adaptable to portable sets.—G. S. Corpe, El Monte, Cal.

Above all don't buy a pair of cheap ear-phones. The difference between a good and bad pair of phones is usually the equal of one to two stages of amplification.

Dielectric Panel Made From Glass and Paper

A neat and an inexpensive panel can be made of two pieces of window glass and a piece of black paper the same size.

First shellac one side of the paper and stick it to one of the pieces of glass and then shellac the other side of the paper and lay the other piece on it and clamp them together with clamps until dry and



then it can be drilled with an iron drill using a little oil or turpentine.

You now have a panel that is a good dielectric and is neat appearing.

The panel can be fastened to the cabinet by the use of brackets.—Lee H. Bolen, Hamilton, Mont.

Make a Good Lead-in

Even though the lead-in wire is insulated, never let it get up against any metal. This means the cornice around the edge of the roof, the metal window screens or weather strip, or any other metal. Even if it is insulated there will be leakage here, and trouble will surely result. It usually manifests itself by constant whistling and inability to clear up a station altogether.

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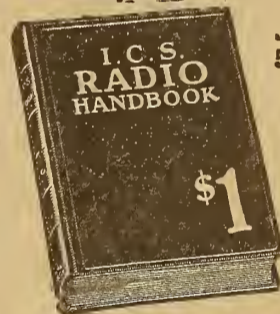
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Questions and Answers

Super-heterodyne

(S417) WRV, Hensler, N. D.
 I have built a super-heterodyne and can't get it to work properly. I can only get a faint sizzling and a squeal by turning up the rheostat. I've checked everything, but O. K. When hooking the phones and a 4½-volt C battery in series I can get a click most anywhere, but mostly by touching the common—and the 45 and 90+. Should this be possible when not connected to any batteries and no filament lighted? Also this frying remains when filaments are turned off. When touching a micadon about .002 mfd., should there be a click when making and breaking the contact? These are all foolish questions, but one can't ask the first man that comes along on the farm for this reason of asking you. Thanks for some real information how to make it work.

A.—We have carefully noted action encountered in operation of your super-heterodyne receiver.
 The click heard when connecting phones and battery in series is normal and due to capacity effect between wiring.
 The frying sound would indicate a defective transformer, condenser or tube socket. It will be necessary to test each unit for possible opens, shorts or leaks.
 It is quite impossible in your failure to submit a diagram of circuit to determine definitely the source of your limitations. The circuit in question in all of its modifications is some task for the average layman and skill both of construction and operation are essential to realization of its superior attributes.

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Don't You Get Tired

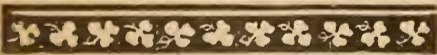
of only hearing LOCAL stations on your Crystal Set? There's music on your aerial every night from stations far away. If you want to hear it without buying a tube set, WRITE ME TODAY.

LEON LAMBERT
 501 South Volusia Wichita, Kansas



You Can Also Charge "B" Batteries at Home!

The APCO "B" Battery Charger is a worthy ally to the successful APCO Charger for "A" batteries. Renews any 24 or 48-volt wet "B" battery in ten hours—without disconnecting set. It's noiseless, clean and easy to hook up as an electric iron. Complete with wires ready to use, \$10. Write for interesting circular and nearest dealer's name.
 APCO MFG. CO., Carr St., Providence, R. I.



Two tubes do the work of five
 Shamrock-Harkness set does this. Send 10 cents for booklet

SHAMROCK MANUFACTURING CO.
 Dept. 21-A, Market St. Newark, N. J.



Choke Coil

(S293) DEH, Bellefontaine, Ohio.
 As I am a weekly reader of the Digest I would like to have you tell me how much wire must be used, what direction must each winding be wound, what size and shape core, and other data for the construction of a one and one-half henry choke coil, to be used on a ten Watt Transmitter?

A.—In the construction of a one and one-half henry choke coil it will require a core 2 inches square with 4,000 turns of number 26 wire.

Resistance Coupling
 (S508) ERS, Montreal, Can.
 Thank you for your kind reply to my letter number 08151.

The request was briefly this: If a two-stage audio frequency amplifier can be converted into a two-stage Radio frequency resistance coupled amplifier, please give me full instructions how to re-connect as in connection with 3-coil circuit. If you could give me the full circuit I would be obliged, also how to wire the two-stage amplifier.

Pleased to say Miloplex King III with "CRYSTAL Sets Tested 600 Miles." You can now get a genuine Lambert Long Distance Crystal Radio Set for only \$4.98. Particulars free. Leon Lambert, 501 Volusia, Wichita, Kansas.

SELL Coal in Carload Lots. Side or Main line. Experience Unnecessary. Earn week's pay in an hour. Liberal drawing account arrangement. WASHINGTON COAL COMPANY, 945 Coal Exchange Building, Chicago.

OSCIL TONE RADIO TUBES
GUARANTEED for 1000 Hours Life
 Replaced irrespective of purchase place. All types. UV-199 on Stand and Socket. No Special Adapter or Socket required.
 If Dealers cannot supply, apply direct distributors. **R-C MILLS RADIO CORE**, 303 FOURTH AVE., NEW YORK CITY
 Sales Agents Wanted

Steinite Gives Distance On Crystal Sets!
 Results truly amazing. Everyone astonished. H. Harryman, Opeyke, Ill., says: "I have heard 26 stations, most distant 825 miles, Schenectady." H. Lapsley, Council Bluffs, Ia., says: "Second night I got KDKA, E. Pittsburgh." You can't doubt my own ears. Listen in on **STEINITE** at my risk.
50c Each or 3 for \$1.00

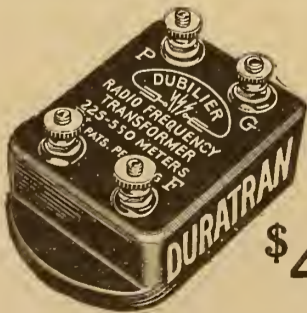
STEINITE opens up new possibilities for crystal sets. Don't delay the Radio treat in store for you. Send Dollar Bill today for 3 Crystals and free booklets. None genuine unless stamped "S" Two big Atchison Banks guarantee prompt refund if not delighted. Literature **FREE**.

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 9 Radio Bldg., Atchison, Kansas

ULTRADYNE TRANSFORMERS
 1 Input Transformer and 3 Intermediate Transformers **\$20.00**
 Tuning, Oscillating Coils, **\$ 4.00** per pair.
 Full instructions and Blue Prints furnished with each kit. Absolutely guaranteed. These transformers are suitable for any Super-Heterodyne circuit. Put up in handsome Kit display box. Special discount to dealers. Prompt delivery. Write for special circular.
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 1524 Fernwood Ave., Toledo, Ohio



The Dubilier Duratran
 The radio-frequency transformer that amplifies uniformly over all broadcasting wave lengths. Made to satisfy the man who knows radio.
DUBILIER CONDENSER AND RADIO CORP.
 43 West Fourth Street, New York



two stages is still the pride of the neighborhood.

Can you also supply value and character of inductance between variometers, Q. & A. 6927, Koppasch circuit, March 22?
 A.—We do not recommend resistance coupled Radio frequency as the amplification per stage realized in the method is so small. Tuned Radio frequency amplifier as indicated in circuit of your inquiry is superior.

The inductance coil between the variometers of the Koppasch circuit is a forty

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 UV-199—200—201A—WD-11—12 **\$3.98**
 C299—300—301A—C11—12
 Fresh Burgess or Eveready "B" Batteries
 22½ Volt large size \$1.68—45 Volt \$5.00 size \$3.33
 Write for Complete Price List
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Super Crystal
 New Non-Metallic Housing Eliminates Scratches & Squealing
 Wonderful new crystal—has millions of sensitive spots—long life—cannot short circuit.
FITS ANY STANDARD DETECTOR
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The Traffic Cop of the Air

He arranges in orderly fashion the mass and jumble of Broadcasting Stations that are seeking entrance to your set and brings them in, one at a time, so you can enjoy them! Never duces, but nearly always increases volume. Add a Ferbend Wave Trap to your set and "Police" your reception. Regulate the Traffic
 Guaranteed to tune out any interfering station. The price is \$3.50. Shipment made parcel post C. O. D. plus a few cents postage. If you prefer, send cash in full with order and we will ship postage prepaid. Send us your order today.
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 23 E. South Water St. Chicago, Ill.

Guaranteed Head-Sets
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 NOW READY
 The new 1924 Model F | The new "Red-Head" Jr.
\$6.50 Per Pair Complete | **\$5.00** Per Pair Complete
 "Red-Heads" sent prepaid on receipt of price if you are unable to get them at your dealers.
THE NEWMAN-STERN COMPANY
 DEPT. R. D., NEWMAN-STERN BUILDING, CLEVELAND, OHIO

turn coil number 22 dec. tapped at every tenth turn and is wound on a tube to fit easily on stator opening of variometers, as it rests upon them.
 We are congratulating you upon your Miloplex, King III, receiver and its popularity.

YOU NEED NAMES!
 I've had letters from 50,000 Radio fans. Can furnish names in any number and from any state or city desired. Write for prices. **Leon Lambert**, 501-F Volusia, Wichita, Kansas.

FREE Attractive Radio Catalogue
 Just write your address. You need not include stamps.
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 1522 Charlotte St. Bronx, New York City

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 SETS
 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 210 England, and 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.
 Send 2-cent stamp for circular giving one, two and three bulb hook-ups of this remarkable circuit.
ELGIN RADIO SUPPLY CO.
 207 East Chicago Street ELGIN, ILLINOIS

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Buy your Keystone Arrester today—install it according to instructions supplied, and forget about lightning. Made of Bakelite—weather-proof. No vacuum to lose. Approved by Underwriters. At all Dealers, \$1.50.
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Radiophone Broadcasting Stations

Corrected Every Week—Part III

FIND MISTAKES AND YOU'LL GET DOLLAR

ONE DOLLAR will be paid to the Radiophan reader of Radio Digest submitting the most errors in any one station's listing in the Directory of Radiophone Stations...

NOTE.—The third part of the schedule list appears below. The fourth part consists of the remainder of the list and the complete state, city-station index will appear next week. WDAF, Kansas City, Mo. 411 meters. 500 watts. Kansas City Club, "Nighthawks" Daily ex Sun, 3:30-4:30 pm, music; 5:50, markets, weather; 6-7, educational, bedtime story, music; Mon, Wed, Fri, 8-9:30 pm, concert. Tues, Thurs, Sat, 11:45 pm, Nighthawks. Sun, 4-5 pm, music. Central.

WDBT, Hattiesburg, Miss. 236 meters. 10 watts. Taylor's Book Store. WDBU, Skowhegan, Maine. 258 meters. 10 watts. Somerset Radio Co. Slogan, "Only One Skowhegan. The Garden Spot of America." Fri, 7:30-10:30 pm, Eastern.

WGBL, Lancaster, Pa. 248 meters. 10 watts. Lancaster Elec. Supply & Construction Co. Slogan, "World's Gardens at Lancaster." Mon, Wed, Fri, 7:30-9 pm, 11 am, 7:30 pm, church service. Central.

ton Tribune. Daily ex Sun, 12:35 pm, reports, occasional evening program. Central. WIAF, Philadelphia, Pa. 254 meters. 100 watts. Howard R. Miller. Irregular schedule.

Save Money BUY A KELLOGG RADIO KIT Everything complete for assembling two stages of audio frequency amplification The panel is drilled for three tuning units, which together with this No. 501 Kit will complete a radio set using your favorite hook-up, or most any other that you may desire to try. KELLOGG SWITCHBOARD & SUPPLY COMPANY 1066 W. Adams St. CHICAGO, ILL.

The more you know about you the more you rely on DeForest! DE FOREST RADIO TEL. & TEL. CO., Dept. R. D. 11, Jersey City, N. J.



Radiotrons WD-11 and WD-12 Made History!

It isn't a genuine WD-11 unless it's a Radiotron.
It isn't a genuine WD-12 unless it's a Radiotron.
It isn't a genuine UV-199 unless it's a Radiotron.
It isn't a genuine UV-200 unless it's a Radiotron.
It isn't a genuine UV-201-a unless it's a Radiotron.

You Can Change Your Set to Dry Battery Operation.

If your radio set is equipped with navy type tube sockets, you can change to dry battery operation by inserting WD-12 Radiotrons. Ask your dealer for information as to how this can be done.

These are dry cell tubes—the tubes that made possible the swift progress of radio in the home everywhere. They meant clear tone—undistorted detection—radio and audio amplification—and volume reproduction—all with dry batteries. They meant radio in the city—on the farm—off in camp—everywhere!

And to-day, there are millions of these Radiotrons in use. Everybody knows

them familiarly as “WD-11’s” and “WD-12’s.” But they are not genuine unless they are RADIOTRONS. Always be sure to look for that mark on the base, and for the RCA mark on the glass. It's important, whether you are buying a new set with the Radiotrons in it, or buying new Radiotrons to replace old ones. Always look for the Radiotron mark and the RCA mark. Then you have the genuine—sure to live longest—serve best.

Radio Corporation of America

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