

SUPPORT NEW WAVE PLAN

STATIONS READY TO BROADCAST SPORTS

BASEBALL ON AIR FROM WEAF APRIL 22

Auto, Yacht and Horse Races Are Scheduled to Entertain Fans Throughout Country

NEW YORK.—It's going to be an active summer for the followers of Radio. Numerous stations will broadcast various sporting events, covering everything from baseball to yacht racing. No longer will it be necessary for the boys to look for knot-holes in fences to watch the ball game. All they'll have to do will be to tune in to one of the large stations, and they can follow the game without fear of having a cop chase them away.

Giants-Braves Games on Air

On April 22 the game between the New York Giants and the Boston Braves will be broadcast direct from the Polo grounds by Graham McNamee, well-known sports announcer, through WEAF.

Two of the most important sporting events of the year—the Kentucky Derby and the Indianapolis Speedway races—are to be broadcast by WGN, Chicago, Ill. Saturday, May 16, is the date of the Derby and Saturday, May 30, Memorial Day, is the date of the auto races.

WAHG Has Portable Broadcast Sets

Station WAHG, Richmond Hill, is having three cars equipped with low wave transmitters for rebroadcast work, also one sixty-foot yacht. By this means any sporting event can be followed and broadcast. It will be picked up and rebroadcast by WAHG.

Boat races on Long Island Sound will be broadcast from the yacht. College boat races are also in negotiation. At least one important tennis tournament is included in the summer sports schedule of WAHG.



CONGESTION OF "B" CLASS UNBEARABLE

Want No New Stations

Kintner Plan Proposed Anew as Remedy for "Traffic Jam" of Ether Roadways

CHICAGO.—The broadcasting chaos which Chicago and New York have already reached, and other communities are fast approaching, has caused leaders in the broadcasting, manufacturing and administrative branches of the Radio industry to look to the listeners for relief. Important questions must be decided. No laws are available. The public must rule.

Foremost among the suggested remedies is the Kintner plan, outlined in Radio Digest in its March 14 issue, for the control of ether congestion. Many adherents are boosting this plan, which is reprinted this week for the consideration of listeners who have not had it called to their attention.

Crowded "Roadways" Today

Why the cry of congestion? There are but 96 wave bands, or ether "roadways," available for the use of approximately 580 stations. Of these 580 stations, nearly 100 are class B, and transmit 500 watts or more power into the crowded roadways. But class B stations have but 48 roadways

(Continued on page 2)



Left, Alice Warren Sachse, program director of Station WFG. She is a renowned pianist and has a host of followers. Above, Mary Mellish, star of the "Natja" company, interviewed recently from Station WGBS by Terese Rose Nagel. Right, Olga E. Edlen, under whose direction a concert conducted entirely in Swedish was broadcast from WOC, Falmer school, at Davenport.



FANS RUSH TO NAME FAVORITES FOR CUP

FIFTY NEW NOMINATIONS MADE DURING WEEK

Second Annual Radio Digest Gold Cup Award Develops Spirited Interest of Announcer Admirers

Fifty new nominations for the most popular announcer for 1925 were received last week by the Radio Digest GOLD CUP AWARD editor. Among them were included many of the more popular and well-known announcers throughout the country.

From all indications, this contest will be eagerly watched by fans, more so than the last award. Many who are writing in have told why they think their favorite announcer should get the cup. And some of the reasons offered are exceptionally good. But just who will win it, is the big question. It will take some time to do this, but the effort will be well worth the reward.

Show Great Enthusiasm

Never before have fans shown so much enthusiasm in any sort of contest as they have in this. They feel that the announcer is part of them, and they are willing to work to see that he gets all the votes that is humanly possible. Many are working toward this end by forming clubs, so that the votes can be collected systematically and thereby gain the advantage of getting a large number of bonus votes.

Get out among your friends and decide which announcer you favor. Collect all the votes possible, then sort them out so that you can take the advantage of the bonus votes. Then send them in. By doing this, the votes can be tabulated immediately, thereby showing the standing of your favorite announcer in the following week's Digest.

Now, work for your favorite and see that he wins the Radio Digest Second Annual Gold Cup. When he gets the cup you can say that you did your best to help him along. It will take plenty of work to win this year's cup, for competition is very keen. Others are doing it, why not you?

Fifty New Names for Cup

Here is the list of fifty new names nominated by fans during the past week!

CFCA, E. J. Bowers
 CHNC, R. H. Combs
 CKAC, J. N. Carter
 CKY, D. R. P. Coats
 CNRA, F. W. Hartee
 CNRA, G. A. Wright
 CNRO, A. W. Ryan
 CNRW, R. H. Roberts
 KFI, Earle Anthony
 KFI, Hastings
 KFI, Paul Regess
 KFRU, Okla. Pepper
 Bird
 KGO, Howard Millholland
 KLDS, Arthur Church
 KSD, Miss V. A. L. Jones
 KTHS, G. C. Arnoux
 KYW, Fred Hill
 KYW, "Sen" Kaney
 WBAV, M. M. Carothers
 WEZ, H. E. Bach
 WCAE, Jos. Sartory
 WCAP, Wm. T. Piersen
 WCAI, Willie Williams
 WCCO, Paul Johnson
 WCTS, Chester Gaylord
 WREO, Roy E. Davis

is your favorite's name in this list, or in either of the other two lists published

in the last two issues? If not, you had better remove the "nomination certificate" from the top of this page, fill it with the necessary information, and send it to the GOLD CUP AWARD EDITOR, care of this magazine. But you don't need to nominate anyone whose name has appeared.

After nominating, don't forget to save your ballots for your favorite.

How to Win Cup for your Choice

Don't miss a single ballot, for when these are turned in to Radio Digest in a group of CONSECUTIVE numbers, extra bonus votes are allowed the announcer for whom you are voting.

The ballots, top of page two, numbered consecutively, will appear in each issue of

numbered ballots, 30 votes. For each 16 consecutively numbered ballots, 40 votes. For each 20 consecutively numbered ballots, 50 votes, and for each 22 consecutively numbered ballots, 60 votes bonus will be allowed.

Send nominations or ballots to the GOLD CUP AWARD EDITOR, Radio Digest, 510 N. Dearborn St., Chicago.

WLW Broadcasts Market Reports

CINCINNATI, Ohio. — Market reports dealing with fresh fruits, vegetables and crops, are now broadcast through the Crosley WLW super power station in cooperation with the Cincinnati office of the United States bureau of agricultural economics at 6:45 p. m., Central time, daily, except Friday and Sunday.

stations, that the B roadways are threatened with nightly "traffic jams" and "accidents." Translated to Radio terms the jams and accidents become "heterodynes" and "noises." When two B stations get too close to one another on the road the listener hears the most powerful or closest of the two at about thirty per cent efficiency. Even then the "heterodyne" whistle of the jamming station is very objectionable. Regenerative sets are often wrongly blamed with this station interference.

Hence the cry of congestion.

Big Centers Hopeless

In Chicago and New York the above conditions are so unbearable that the Radio section of the department of commerce will not promise a license to any firm contemplating a station within sixty miles of either city until some of the existing stations cease to broadcast.

Supervisor E. A. Beane of the Ninth District, of which Chicago is a part, has stated that he absolutely will not and cannot give a class B license to any further stations in this district.

What can the listeners do? What is the next step?

Secretary of Commerce Hoover is powerless to do more than he has already done. The antique Radio laws are still the same as those passed in 1912, before broadcasting was dreamed of, and give him no weapons with which to handle the problems of today. He has therefore suggested that Radio Listeners express their wishes in some organized form so that he can rule for the good of the majority.

Kintner Plan Is Proposed Anew

Radio Digest therefore presents the Kintner plan again. This, it is believed, if adopted would be a permanent cure for the broadcasting congestion now so detrimental to the welfare of Radio.

The plan of S. M. Kintner, research engineer for the Westinghouse Electric and Manufacturing company, is to have four classes of stations. Promotion from a minor class to a major class would be in order of precedent, together with the ability to serve the public as a prime consideration.

Class I would be for super de luxe stations, with from 5 to 50 kilowatts (thousands of watts) of power. Fifteen 20-kilocycle roadways ranging from 300 to 416.6 meters would be allowed. These fifteen roadways would be occupied by fifteen broadcasters which would not divide time with anyone.

Class II for 500-Watt Stations

Class II would be for 500-watt stations. Seventeen 10-kilocycle roadways ranging from 428.5 to 555 meters would be allowed. These seventeen roadways would each be shared by four stations, dividing time two ways. Thus room would be made for sixty-eight stations in this class.

Class III would be for 100-watt stations. Forty-five roadways of ten kilocycles each would be provided, ranging from 205.5 to 294 meters. These forty-five roadways would each be shared by twelve stations, dividing time three ways. Thus room would be made for 540 stations in this class.

Class IV Is Waiting List

Class IV would be the waiting list. No station in this class could have a power more than 100 watts. Four 10-kilocycle roadways would be provided, ranging from 200 to 204 meters. The number of station on each roadway, dividing time, and the number of time divisions necessary, would be as required.

That, in brief, is the Kintner plan. It may be improved, but it is at least a definite proposal which would stop the present congestion.

What is the consensus of Radio fan opinion? Do listeners want better Radio conditions? Secretary Hoover waits for the answer.

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Looking Ahead

Extra Added Treat for "Evening at Home" Fans. This week the users of this popular table, which appears corrected every week in Radio Digest, will find it given in both Central and Eastern Standard Time. Next week the table will be given in three different standard times! It will be in Eastern, Central and Pacific Time. In addition, larger and more readable type will be employed. Don't miss this!

Readers Who Have Enjoyed the Feature Pages Devoted to Stations whose "voices" have become familiar to them, will be glad to learn that among the very next broadcasters to be described by word and camera will be KFI, Anthony's, Los Angeles; WBZ, Westinghouse, Springfield; WCCO, Gold Medal station, Minneapolis-St. Paul, and KOA, General Electric, Denver.

The Operation of Super-Zenith VII will be explained in the next issue. How variable coupling is applied to tuned R. F., and the controlling of two condensers from a single knob, will be clearly shown. Both the man who owns one and the home constructor will find much information of value in this article.

A. B. C. Radio Course Takes up Alternating Current next week with detailed attention to its effect with inductance. Radio currents are alternating currents, and data presented by Professor Moreton in this next article is to be studied carefully. Later articles will be written on the assumption that these elementary chapters have been thoroughly assimilated by the reader.

Newsstands Don't Always Have One Left

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Radio Digest

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STATION GLEANINGS AND NEWSY BRIEFS

WBZ WILL TRANSMIT PAUL REVERE PROGRAM

"Cappy Ricks" on the Air at KGO—WOWA Celebrates Second Anniversary by Special Program

Saturday, April 18, is the 150th anniversary of that famous ride of Paul Revere. WBZ will broadcast by remote control the special services from the Old North church, Boston. The speakers will include Vice-president Charles G. Dawes, Mrs. Nathaniel Thayer, Bishop Lawrence, Bishop Babcock, Dr. William H. Dewart, the rector of Old North church, and Paul Revere, the great-great-grandson of the famous man. Station WHAZ, Troy, N. Y., broadcast a program along these same lines last Monday night.

"Fasse," a one-act tragedy, and "Rosalee," a one-act comedy, featuring the KOA players, under the direction of Iris Ruth Pavey, will be the headliners for Friday evening, April 24, from the station at Denver.

"Cappy Ricks," dramatized from Peter B. Kyne's novel, by Edward Rose, playwright, will be presented by the audio players before the KGO microphone Thursday evening, April 23.

Station WOWA, Omaha, Neb., recently celebrated their second anniversary on the air by giving a special program for the fans.

Verdi's celebrated "Il Trovatore" was sung recently from Station WGCS. This was the fifth opera in the series which they are broadcasting under the direction of Maestro Cesare Sodero.

The famous Paulist choir of Chicago was heard on Easter Sunday from WGN, the Chicago Tribune station on the Drake hotel. The entire musical service during the high mass at St. Mary's church, starting at noon, was put on the air.

"Twenty Minutes of Good Reading" every Thursday, from 8 to 8:20 p. m., Central time, given by Rev. Claude J. Perrin, S. J., over Westinghouse Station KYW, has become one of the most outstanding features of that station.

Another talented artist has been added to the regular staff of Fairbanks-Morse and company, broadcasting talent who are on the air every Tuesday evening from 8 until 9:30, Central standard time. The latest addition is Clarence Peterson, piano accordion virtuoso.

Music from the new \$26,500 Wurlitzer organ and orchestra unit is soon to be heard by the WLW Radio audience. Its installation and tuning is nearing completion in the new studio. The instrument is built especially for Radio broadcasting.

Nathaniel Finston, musical director of Balaban and Katz' Chicago theater, has conducted an overture for Radio audiences once a week for nearly two years. The regular Chicago theater Radio revue is broadcast over Station WMAQ every Saturday night from 9 to 10 o'clock, Central time. Every other Sunday noon a symphony concert, under the conductorship of Mr. Finston, is presented in the Chicago theater and broadcast by Station WGN.

"A dollar Value for a Dollar Spent," was the subject of an address given by William P. Green, associate director of

LONG LIVE THE KING SAY HAREM QUEENS

PARIS, France.—King Sisowath of Cambodia, only 92 years old, has hit upon a solution for the divorce problem. He has had all the problems of a harem on his hands for many years, and now he is growing old and finds himself a little too weary to keep all his spouses happy. So he has installed a fine multi-tube set in the harem. All's well in Cambodia!



Eighteen years old, and the star of them all. That is the honor which falls to Rosaline Greene of the WGY dramatic players. During her freshman year at New York university she was associated with the Washington Square players—now she is with WGY. She has had numerous offers from large New York producers to play on the stage, but refused them all to play to the invisible audience before the microphone.

WENDELL HALL IS NOW ON AIR AGAIN

Absent from Ether Due to Death of His Father—Broadcast from WLS

CHICAGO, Ill.—Fans who have been wondering where Wendell Hall, the red-headed music maker, has been for the last two months, were agreeably surprised to hear him again from Station WLS. He has been off the air due to the fact that his father died, and out of respect for him he refrained from broadcasting. He returned recently from a trip to Cuba and Europe, where he was received with great ovations from the European fans. None of his bag of songs have been lost since his last appearance in this country. The same old drawl and humor, so characteristic of Wendell Hall, is again entertaining the hundreds of fans throughout the country.

Radio Inventor Gone
NEW YORK.—Impatient at the delay of the patent office in granting him a patent on a Radio device, Anthony Bosson, 28 years old, of 113 Atlantic avenue, Richmond Hill, left home recently and has not been seen since. The patent arrived the day following his disappearance.

LOS ANGELES HEARS EARTH-ANTENNA SET

CONTINENT CROSSED WITH UNDERGROUND AERIAL

James H. Rogers Uses Three 50-Watt Tubes in Set—Claims Earth Crust Transmission Best

WASHINGTON, D. C. — The Pacific coast has been reached by an underground aerial Radio transmitting set, according to James H. Rogers, well-known local inventor. He claims that signals from his set were recently received at Los Angeles. Mr. Rogers states that he has before successfully transmitted as far as 2,500 miles and he intends very shortly to try the underground methods for crossing the ocean. The Rogers underground system has been in use for some time by the signal corps of the Army, but it is understood that the Army's experiments have covered short distances only. The set employed by Mr. Rogers in his latest experiment which reached the Pacific coast used three 50-watt tubes with a wave length of 180 meters.

Believes Underground Radio Best
Discussing his theory of underground Radio transmission, Mr. Rogers says: "Radio energy is propagated, in my opinion, through the medium of the crust of the earth. It is possible to send electrostatic waves through the air, but they follow light waves in a perfectly horizontal direction, and are not bent down to the earth. "The greater portion of the energy used in the present form of transmitting thus goes in a tangent from the earth, misses the receiving aeriels and is dissipated in the air."

HOBO TUNES TO WREO; TELLS OF ENJOYMENT

Hasn't Dime to Send for Verification Stamp

LANSING, Mich.—Words of praise of the programs broadcast from Station WREO, the Reo Motor Car company here, have been received from hundreds of cities and by people in every walk of life, but the most nique "applause" card has just been received at the station from New Rochelle, N. Y., by one who signs himself "Weary Willie." "Excuse pencil and paper please," he writes. "You see, it's the best I can do. I am what is so aptly termed a hobo. But I am also a Radio hound and have a little set I carry in my pack to use whenever the occasion presents itself. I have listened in on several occasions to your excellent early Friday morning orchestra programs and have always enjoyed them. "I haven't the dime to spare for a verification stamp, but would appreciate hearing from you. I have 23 cents left after buying the stamp for this letter, but I know a place to sleep and have never yet begged a nickel or a meal, and I've been in forty-three states and eleven countries."

Unless abbreviations or nicknames are permitted, it is thought that the new Slovak Radio broadcasting stations will have to carry a couple of spare announcers.

the National Vigilance committee, from Station KDKA recently.

Both professional and amateur musicians at Station WMC, cooperated and gave a concert April 14. This concert was broadcast from WMC, Memphis, Tenn.

WJZ and WGY, will broadcast the circus from Madison Square garden, New York. All members of the animal tribe will make their appearance before the microphone.

Experiments are being carried out by the Radio department of the Canadian National railways for the broadcasting from moving trains.

Announcer to Publish Book of Poems in Near Future

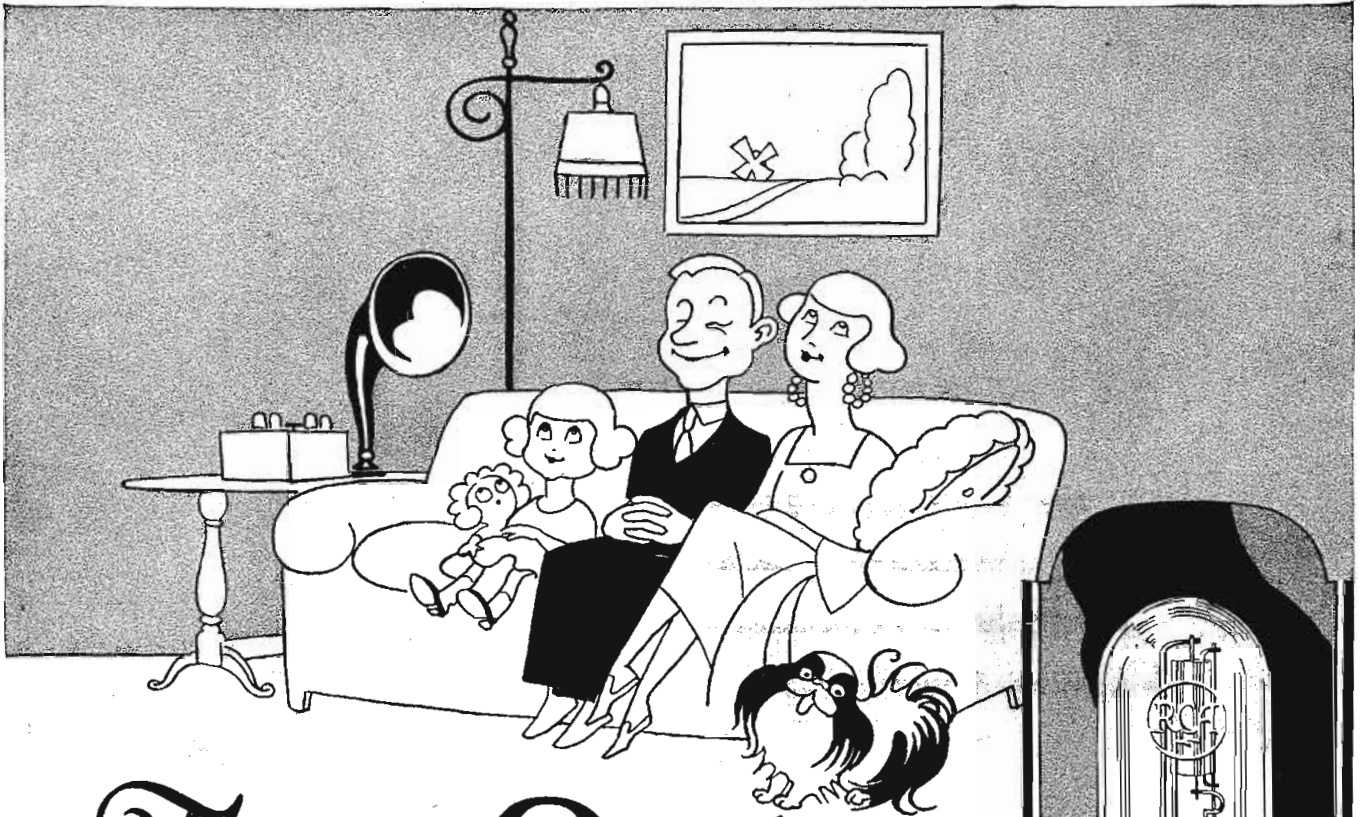
NEW YORK.—Largely as a result of his reading his original poems from Station WEN, NTG, announcer and director of the station, has accepted a proposition to publish a book of poems, which will include several by himself, also poems by Doris Kenyon, the famous movie star, Lew Brown, the well-known song writer, and Marjorie Lee, one of the famous Ziegfeld girls.

N. T. Granlund's poems will comprise verses about Broadway and several sea poems, some of which have already been published.



Georgia School of Technology is now on the air with a 500-watt broadcasting station. The call is WGST. Above is shown a group of students giving the college yell. Right, Johnny Persons, announcer. He is a junior in the electrical engineering course, and was elected announcer through a unique contest, in which sixteen candidates competed.

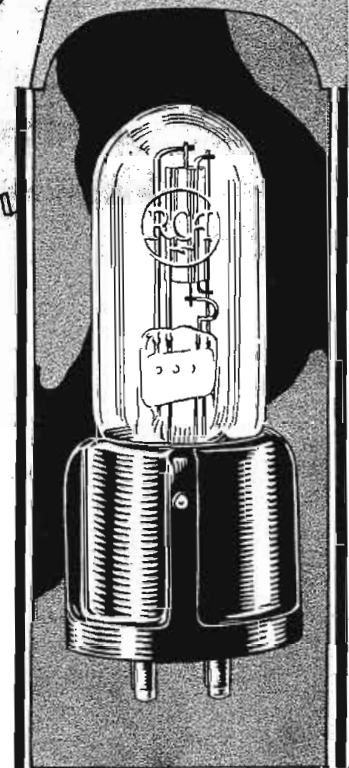




There's Quality in everything

IN everything from a binding post to a vacuum tube, there is quality. But quality counts most in the vacuum tube. A radio set can be built for distance, for clear tone, for volume. But to get the best out of any hookup—you want to fit it with genuine Radiotrons.

No matter what type of set you have—or what type of circuit you are buying tubes for—ask for Radiotrons by name—and make sure you get the genuine by looking on the tube for the word Radiotron and the RCA mark. Quality counts!



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WD-12 WD-11 UV-200
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KTHS—New Arlington Hotel, Hot Springs



Left, E. L. Olds, technician for Station KTTH. Olds is known to Radio fans as "ELO." Above, the home of KTTH, the palatial New Arlington hotel at Hot Springs National Park. Right, G. C. Arnoux, better known as "GCA," an old friend of the fans, formerly connected with WBAF. He is director-announcer of Station KTTH. His program innovations have pleased a multitude of fans.

WAY back in 1532, nearly four hundred years ago, the famous traveler and explorer, De Soto, wearied and with a travel worn and battle scarred command, furnished the inspiration for the slogan of Station KTTH, the new Class B broadcaster of the palatial New Arlington hotel at Hot Springs National Park, Arkansas, when he came to Hot Springs.

"Kum to Hot Springs," KTTH slogan, is a phrase that Radio fans the country over have come to know and look for on the air the last two months and more since the Arlington station took the air for its first program December 20.

Ever since De Soto began the known history of Hot Springs, Arkansas, its medicinal springs have grown in fame until it attained an international fame as a health and pleasure resort, and the management of the New Arlington hotel decided that the latest type of powerful broadcaster was only in keeping with the traditions of the city.

KTTH has attained several unique distinctions since it started out in the business of filling the air with music. In the first place it is the only station in America that is located in a National Park district and thus has the close friendship and cooperation with the Department of the Interior at Washington. Director of National Parks, Stephen F. Mather, was one who took part in the official opening program on New Years Eve last.

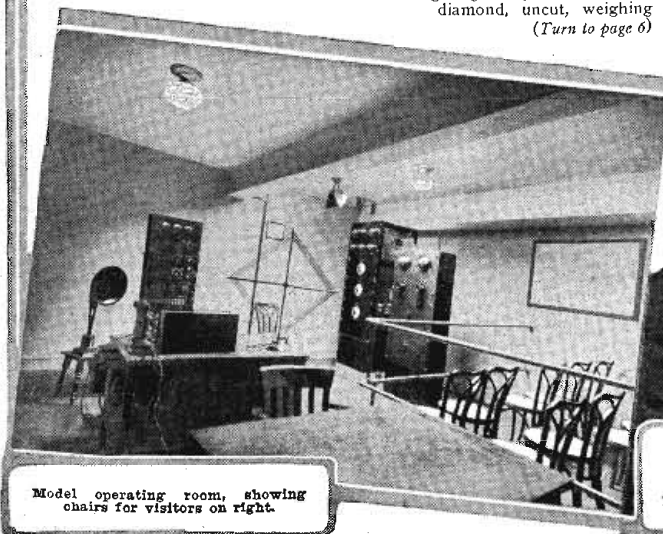
Another unique feature is the gift to one Radio fan a month of a round trip ticket from his home to Hot Springs and entertainment at the New Arlington hotel, with a royal good time as the official guest of the Junior Chamber of Commerce at Hot Springs. The first fan to attain this distinction was Loyd H. Jordan, Nebraska; and the second fan chosen was Delmer L. Hausen of Barnesville, Minnesota, and on March 20, still another fan was chosen. Every Radio listener who writes in to KTTH is legible. No other station in the United States has adopted this method of entertaining the fans and rewarding them for their Radio applause.

The third unique "stunt" by the New Arlington broadcaster was the giving away of a genuine diamond, uncut, weighing

(Turn to page 6)



A corner of the Tower studio of KTTH, located in the north tower of the New Arlington hotel, on the twelfth floor. Right, Lawson Reid, organist at the Princess theater, whose weekly concerts are great favorites.



Model operating room, showing chairs for visitors on right.



Jack Benard, director of the Meyer Davis orchestra, which plays frequently at KTTH.



"Smiling" Chas. S. Fischer, noted director of the Eastman Hotel orchestra.

"KUM TO HOT SPRINGS"

(Continued from page 5)

nearly two carats, mined in the diamond mines of Murfreesboro, Ark., the only diamond mine on the North American continent. The business men of Nashville, Ark., offered the diamond through KTHS and it was awarded to Miss Louise Givens of Malvern, Ark.

The programs are given from two studios in the New Arlington hotel, one known as the "Tower Studio," located in the top of one of the twin towers of the New Arlington; the other known as the "Mezzanine Studio." In addition to this, private lines operated by KTHS bring music from the Eastman ball room; and sermons from the two Radio churches—the First Presbyterian, Chauncey Hickok, pastor, and the Central Avenue Methodist, Rev. Dr. J. J. Stowe, pastor. These two divisions divide the month on alternate Sunday mornings.

Station KTHS is manned by two old friends of the Radio fraternity, both having been in the broadcasting game almost from the start. G. C. Arnoux, who is known to Radioland as "G.C.A.," his announcing initials, is director-announcer, and handles all announcing. He was for nearly three years program director and chief announcer of Station WJZ at Port Worth. G. C. A. possesses a voice which seems to give an impression to Radioland of a man weighing about 200 pounds, 45 and bald-headed, but his photo, as shown with this story, will furnish an alibi for him on this count.

E. L. Olds, technician for KTHS, holds sway over the operating room, which is one of the most modern and best arranged in the United States. He also is well known to fanland, having acted as operator, announcer and later as Radio editor of Station WBAP. These two experts compose the active staff of KTHS.

A de luxe musical staff is also a part of Station KTHS, the Meyer Davis orchestra, under the direction of Jack Renard, being known all over the country for its jazz and concert programs. Phil Wall, dance pianist, appears in solo at frequent intervals, as do Jack Renard, violinist; Michael Reginsky, formerly cello soloist of the Imperial Symphony at Petrograd; Louis Culp, concert pianist of national reputation, and others. Among noted orchestras on the KTHS staff is that of Charles L. Fischer, eleven-piece organization of the Eastman hotel, sister hostelry to the New Arlington.

Station KTHS is on the air seven nights of the week at 8:30 o'clock Central standard time. Dance concerts are given six nights each week, every night except Friday, following the regular concert hour, and celebrities of various kinds are offered from time to time, from among the visitors to Hot Springs.

A policy inaugurated by Station KTHS that will be maintained is that every communication, whether telegram, card, or letter, receives an answer, if there is sufficient address on the message to insure the reply reaching the sender. Handsome booklets are also sent the fan upon request.

FIRST LAUNCHING CEREMONY ON AIR

Great Airplane Carrier Christening Brought to Fans by Stations WGY, WJZ and WRC

NEW YORK.—The recent ceremony attending the launching of the U. S. S. Saratoga, first line airplane carrier, shipyards at Camden, N. J., was broadcast by three of the stations, WGY, Schenectady; WJZ, New York, and WRC, Washington.

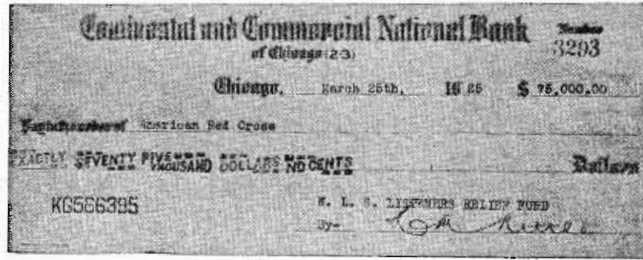
This was the first time that such an event has been broadcast.

Since this was the largest vessel ever launched on the western hemisphere, and will be the most powerful ship in the United States Navy when commissioned, there was widespread interest in the affair.

Mrs. Curtis D. Wilbur, wife of the secretary of the Navy, christened the boat and there was a microphone at the bow to pick up her words and the noise of the crash of the bottle as the "Queen of the Seas" started on her way down the slide into the water. Koltn D. Hager, studio manager and chief announcer of WGY, described the scene incident to the launching and gave a word picture of the unusual looking vessel, told of its wonderful equipment and other interesting facts concerning the ship.

Find Where "Sally" Went
EDMONTON, Alta.—CJCA, Edmonton Journal station on the outskirts of the great Northwest wilderness recently located "Sally," when it held a prize competition seeking the answer to the much-played popular song, "I Wonder What's Become of Sally." Egged on by Big Chief Polar Bear R. M. Stevens of the "Igloo Hut Eskimos," CJCA's club, 354 listeners wrote in satisfactory explanations of "Sally's" whereabouts.

WHEN THE HEART TUNED IN TO WLS



Here's \$75,000—less than half the fund contributed to WLS, the Sears-Roebuck Agricultural foundation station by its listeners in response to an almost three-day continuous program appeal for the victims of the tornado which recently devastated southern Illinois and Indiana. George

Hav, "the Solemn Old Judge," assisted by Ford and Glenn, Remington Welch and other artists, brought forth almost \$200,000 from the pockets of generous-hearted Radio fans. WTAS raised approximately \$80,000, while WBCN listeners helped the cause with \$20,000.

Brunswick's Tuesday Recital to Continue

Close Music Memory Contest with March, However

NEW YORK.—Through arrangements with the Brunswick-Balke-Collender company, Stations WJZ, New York; WRC, Washington; WGY, Schenectady; WBZ, Springfield; KDKA, Pittsburgh, and KYW, Chicago, will broadcast two more "Brunswick Hour of Music" programs during the month of April.

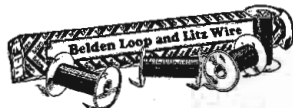
The programs are on the air every Tuesday evening between 9 and 10 o'clock, Eastern time. All broadcasting will be done direct from the Brunswick recording laboratories in New York. Leading recording artists and organizations of the Brunswick company will be heard in the Brunswick programs.

The series of Brunswick Music Memory contest closed for the spring season with the fifth and final contest program broadcast on Tuesday evening, March 31.



Ask the Belden dealer about loops

Are you planning to make a loop for your radio receiver? Then go to the nearest Belden Radio Dealer and examine a spool of Belden Loop Wire. Notice its construction for efficiency. It is made of 60 strands of bare copper twisted with 5 strands of half hard phosphor bronze. The phosphor bronze wires provide strength and make Belden Loop Wire non-sagging and non-stretching. It is just the wire you need for folding loops. The insulation matches the loop frame in color. Get ready for summer radio by making your loop aerial, now! Send for our booklet, "Helpful Hints for Radio Fans." Use the coupon.



Belden Loop Wire

It is merchandised on 100 ft. spools, packed five spools in one Belden orange-and-black striped carton. Leading dealers and jobbers carry Belden Radio Products.

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Manufacturing Company
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CHICAGO, U. S. A.
Manufacturers of Electrical Wire
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Belden Manufacturing Company,
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Please send me by return mail your booklet, "Helpful Hints for Radio Fans."

Name _____

Address _____

NAVY WILL CONDUCT SHORT WAVE TESTS

F. H. SCHNELL LEAVES FOR ASIATIC FLEET

Hold Conference in Chicago—MacMillan to Try and Keep in Touch with Schnell

CHICAGO, Ill.—Scientists were startled by statements made by John L. Reinartz of South Manchester, Connecticut, at a meeting held here recently on the advisability of short wave transmission experiments. He described the phenomena encountered by him in reaching down to almost unheard of low wave lengths. To put it in more simple language, wave lengths below one meter, and closely approaching the frequency of light, when applied to the plates of the tubes, become transparent without apparent heat. This result is instantaneous as the current is applied and before heat could possibly be developed.

Leaves on Asiatic Cruise

In order to experiment further on the short waves, the Navy department is sending F. H. Schnell, former traffic manager of the A. R. R. L., on the Asiatic cruise with the fleet to try out these new waves. He has been commissioned as lieutenant for this purpose. The MacMillan expedition to the North Pole, which leave this country in June, will also be equipped with short wave apparatus. The expedition will endeavor to keep in touch with the fleet when they are off the coast of Tasmania.

Full credit should be given to Captain Ridley McLean, director of naval communications for commissioning and assigning Schnell to active duty. Mr. Schnell will take three transmitters with him. He will work on wave lengths of 20 meters and less, 27.2 meters, 40 meters, 54.4 meters, and 80 to 100 meters. He expects to be off the coast of Tasmania during the middle of our summer here. It will be winter in Tasmania when he arrives there.

Short Waves Best at Distance

One of the queer things about the short waves is the fact that stations operating on short waves cannot be heard nine miles away, but it is possible to hear them easily over 500 miles distant. The call letters to be used by Schnell will be NRRL.

Up to the present time, there are only about twenty amateurs in the United States who are working with real short waves, that is, around 20 meters.

In the near future these columns will contain a description of a short wave receiver capable of picking up both NRRL and the McMillan expedition this summer. Both will use the Continental code. There are no manufacturers at the present time making sets for receiving such short waves.

America Leads Field

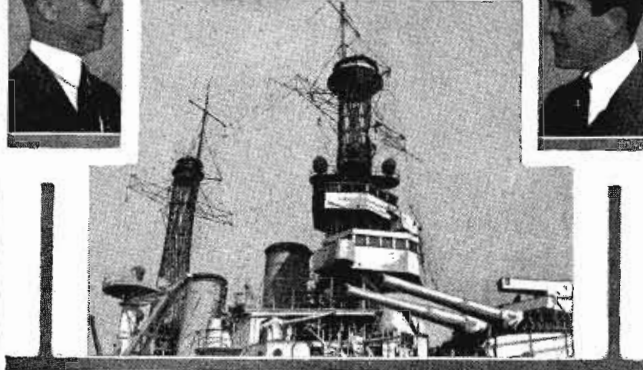
The American amateurs are the first in the world to experiment of such short waves. The only foreigner to try experiments along the same lines is Leon Deloy of France. Up to the present time, however, he has only reached down to 40 meters.

In order to develop the short wave bands, the Navy is now taking lessons from amateurs to learn what they can do. Amateurs enlisted by the Navy for this purpose will be listed under the class 6

PLAN TO STUDY SHORT WAVES



Left, F. H. Schnell, who will go on Asiatic cruise to study short waves. Right, E. F. McDonald, Jr., who will go to the North Pole for the same purpose. Below, type of ship on which Schnell will travel.



heading in the naval reserve. Members of this class do not have to go on cruise unless they want to, but will experiment ashore on the new waves. From this group band of amateurs Captain Donald B. McMillan will pick the

operator which he wants to go on the trip with him this summer. In this selection, Commander MacMillan stated that, personally comes first, even before ability and physique, although the two latter are most important.

Station Changes

WMCA, Hotel McAlpin, New York, has finally been assigned a wave length of 341 meters. It is hoped that the new station will be able to use this new wave length without heterodyning other class B station waves. The WMCA schedule calls for daily broadcasting from 3 to 5 and 9 to 12 p. m., Eastern time.

WHT, toll station planned for Chicago, with studios in the Wrigley building and transmitter at Deerfield, Ill., has postponed its opening again. It is rumored that the station's organization is not complete, and that funds for the purchase of its 5,000-watt transmitter are lacking.

WBCN, Southtown Economist station, Chicago, announces division of time with WENR, All-American Radio corporation station, now working with but 100 watts power, but which in the fall will be increased to 1,000 watts.

The Trianon ballroom, Chicago, world's largest public dance hall, will soon go on the air with a 500-watt station. The aerial towers have been erected.

Plans for the St. Paul studio of Station WCCO, to be erected in the St. Paul Union depot, are nearing completion. It is expected that construction will start in time to complete the studios shortly after May 1.

Seven new stations have been granted licenses during the past week, they are as follows: WHEU, E. L. Bing's Sons, Anderson, Ind.; WIRA, The Capital Times, Madison, Wis.; WTHS, Flint Senior high school, Flint, Mich.; WHBW, D. R. Kienzle, Philadelphia, Pa.; WADC, Allen T.

Simmons, Akron, Ohio; WHBT, Thomas W. Tizzard, Jr., Downers Grove, Ill., and KPVB, Whan Radio shop, Manhattan, Kan.

Station KSL, Formerly KDPT, owned by the Radio Service corporation of Utah, located in Salt Lake City, Utah, has been transferred from class A to class B.

Three small stations have increased their power to 500 watts. KDYL, the Newhouse hotel broadcasting station in Salt Lake City, Utah, has increased its power from 50 to 500 watts. The MacArthur Brothers Mercantile company (KPAD) have changed their power from 100 to 500. WFAV, the University of Nebraska station, have doubled their power. KPMQ, the University of Arkansas, now operates on 1,000 watts.

LONDON, FAR EAST, PARIS SOON FOR FAN

INTERNATIONAL FEATURES LOOM WITH R.C.A. TESTS

Experiments Prove Feasibility of Bringing World to Listeners by Means of Relay Broadcasts

NEW YORK.—The series of concerts from London successfully broadcast recently to millions of Radio listeners in the United States marks the inauguration of a series of great public experiments that may bring London, Paris and even Buenos Aires and the Far East to millions of Radio-equipped homes in America. It is announced by the Radio Corporation of America.

Remarkable progress, it is declared, has been made of recent weeks towards the technical solution of the problems involved.

"Big Ben" and the Hotely Savoy orchestra in London have been relayed by WJZ, WGY and WRC.

"For some time," it is explained in the statement issued, "private tests have been conducted by the Radio Corporation, in cooperation with leading Radio engineers of the Marconi company and the British Broadcasting company, to determine the practicability of broadcasting a regular musical and entertainment program to the American public across the 3,000 miles of Atlantic ocean.

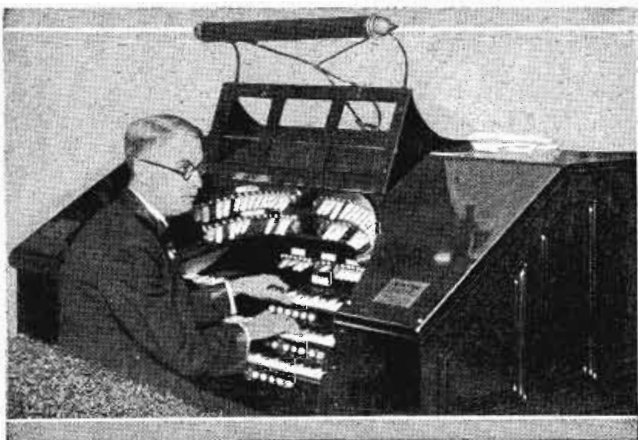
Era of International Programs Dawns

"So striking were the results attained in such favorably situated receiving points as Belfast, Me., and in other experimental receiving stations of the Radio Corporation, that it was determined to open these experiments to the American public, so that results might be noted under varying conditions of reception and within the widest possible range.

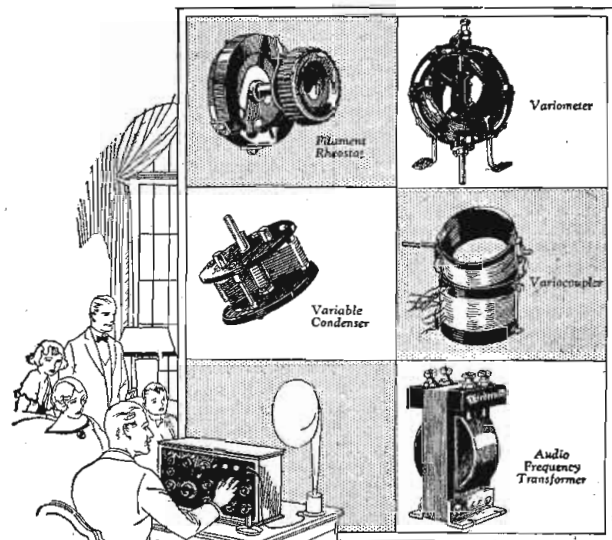
"It may be that from time to time experiments will have to cease entirely because of interruptions that will not permit the demonstrations to be made.

"This much can be said, however, upon the basis of the present demonstrations: Enough progress has been made to warrant the statement that we are now entering upon an era of international broadcasting which, eventually, will bring the entertainment, music and speech of other continents to every home in America."

WCK FEATURES ORGAN RECITAL



Tom Terry, master organist, who is well known throughout the United States for his organ playing. He is seen playing from Station WCK. In spite of the demands for his services, he gives a half-hour daily broadcasting for the benefit of the shut-ins.



Quality Parts Matched for Perfect Teamwork

Your pet "hook-up" needs first quality parts—perfectly matched—to give you real radio.

Every Federal Standard Radio Part is designed, made, matched and guaranteed by Federal. That is why you find Federal parts in all the better hook-ups—that is why you should insist on Federal parts when purchasing.

FEDERAL TELEPHONE MANUFACTURING CORP. Buffalo, N. Y.



Federal Standard RADIO Products

PERSHING NIGHT AT WRC THURSDAY

Monday, April 20

(Continued from page 10)

shoppers' guide, Mrs. Pauline Peck; 10:30-10:40, house band; Dorothy Edith Walsh; 10:40-10:50, talk, John C. Cutting; 10:50-11, fashion talk, Eleanor Gunn; 1-2 p. m., Henry Vander Zanden's Hotel Astoria concert; 4:30-5:30, Fred Hall's Royal Locomotion; 5:30-5:45, Bernard Lovell's Hotel Astoria concert; 7-8, Bernard Lovell's Hotel Astoria concert; 8-9, 10, Wall Street Journal review; 8:10-8:20, N. Y. U. air college; 8:40-9:10, Holy Cross college, glee club concert; 10:45-11:15, Jacques Green and his Club Duarville orchestra.

WLIT, Philadelphia, Pa. (394.5), 12:02 p. m., daily almanac; Stanley theater organ recital; Arcadia Cafe concert orchestra; 2:30, Radio Henry Hour Man, Rev. Sidney Waterbury Powell; 4:30, Henry L. Wilson, baritone; 7:30, Dream Daddy's bedtime stories; 8, Arcadia cafe concert orchestra; 8:30, opera "Erminia"; Lil Brothers' chorus; 10, Arcadia cafe dance orchestra.

WMAK, Lockport, N. Y. (265.5), 8 p. m., Rialto Ritz orchestra; 11:30, Loew's theater program.

WNVC, New York, N. Y. (520), 7-7:30 p. m., Harry Ash's orchestra; 8-8:15, talk, city official; 8:15-8:30, song recital; 8:45-9:15, instrumental program; 10:10-10:30, talk, Dr. Sidney N. Usher.

WOO, Philadelphia, (508.2), 11 a. m., organ recital, Mary E. Vogt; 12:02 p. m., Golden's tea room orchestra; 4-4:15, organ recital, Mary E. Vogt; 7:30, Cardinal's concert orchestra; concert from WFAE; 10-10:30, organ recital, Mary E. Vogt; 10:30, Vincent Rizzo's dance orchestra.

WRC, Washington, D. C. (488.5), 1-2 p. m., luncheon music, Sidney Seldeman's Shoreham hotel orchestra; 4:20, talk, National Geographic society; 4:30, Mayor Davis' New Willard hotel trio; 6, children's Radio Music club, Peggy Albion.

WWJ, Detroit, Mich. (352.7), 8 a. m., setting-up exercises, R. J. Horton; 12:30 p. m., John Klein's Hotel Statler orchestra; 3, Detroit News orchestra; 6, dinner concert; 8, Detroit News orchestra; 9, concert from WFAE.

Central Time Stations

KFAB, Lincoln, Neb. (240), 7:30-8:30 p. m., Lincoln Wholesale Credit Men's association; 8:30-10, Columbia orchestra; Verne E. Powell, saxophone wizard; Orville Andrews, Bulck snare bird; Honolulu Royals Hawaiian entertainers.

KFKU, Lawrence, Kan. (275), 6:50 p. m., piano tuning in number 7; music; 7:15, "Relay Racing and Tom Comptelien"; Cecil Schabandson; 7:30, "The Night of the Performance"; Prof. Allen Carter; 7:45, Spanish lesson.

KFKX, Hastings, Neb. (288.3), 9:30 p. m., program, Prof. Bailey, Prof. Allen.

KFNW, Shenandoah, Ia. (266), 6:30 p. m., Henry Field Seed company; 8:30, Smith Holding trio.

KFRU, Bristow, Okla. (394.5), 7-8 p. m., Oklahoma educational hour; 8-10:30, entertainment.

WEEW, Beloit, Wis. (268), 8 p. m., A. Capella choir; talk, Prof. R. B. Weg.

WEMC, Berrien Springs, Mich. (265.5), 8:15 p. m., Radio Lighthouse Music Makers.

WFAA, Dallas, Tex. (475.9), 12:30-1 p. m., address, Dr. J. D. Bonn; 8:00-9:30, Young Women's association choral club.

WGN, Chicago, Ill. (370.2), 6 p. m., organ recital, Lyon & Healy; 6:40-7, Drako concert ensemble, Blackstone string quintet.

WGST, Atlanta, Ga. (270), 9-10 p. m., Georgia Tech glee club orchestra.

WHA, Madison, Wis. (535.4), 7:55 p. m., school of music program, choral club.

WNAD, Milwaukee, Wis. (275), 7:30 p. m., Marquette studio program, Tiger orchestra.

WHAS, Louisville, Ky. (393.8), 1:15 p. m., Louisville Conservatory of Music.

WHB, Kansas City, Mo. (365.6), 9:45 p. m., Ladies' hour, Sweeney Radio trio; 7-8, male and and boys' hour.

Seymour; 11-1 a. m., Brandistier's Hollywood Mammie cafe dance orchestra, Mel Pedesky, leader.

KGO, Oakland, Calif. (361.2), 4-5:30 p. m., Henry Halstead's dance orchestra; 8, Arion trio; "Lady Bird Beaton"; Prof. E. Peck; "A Lesson in English"; Wilda Wilson Church; address, Althea Richards Nash; "Chats about New Books"; Joseph Henry Jackson; 10:1, Henry Halstead's orchestra.

KGW, Portland, Ore. (491.5), 12:30 p. m., Rose City trio; 5, children's program; 6, dinner concert, Frederick W. Goodrich, organist.

KWJ, Los Angeles, Calif. (405.2), 8-10 p. m., program, 11 Elysian Apartments, arranged by Uncle John.

KLX, Oakland, Calif. (508.2), 6-7 p. m., organ recital; 8-9:30, educational program; 9:30-10, American theater orchestra; 10, meeting, Lake Merritt Ducks.

KXN, Hollywood, Calif. (336.9), 5:45-6:15 p. m., Wurliwitzer music organ studio; 6:15-7, dinner dance music; 8-10, KXN feature program; 10-11, Goodrich Silver-town Cord dance orchestra; Lizian May Chaltoner.

WFI, Philadelphia, Pa. (394.5), 1 p. m., Meyer Davis Bellevue Stratford concert orchestra; 3, Philadelphia music club; 4:30, American gas program; 6, Pat Patterson's orchestra; 6:30, N. Y. Maria Bellevue Stratford concert orchestra; 7, bedtime stories; concert from WFAE; 8:00, Gold Dust Twins; 9, Eveready hour.

WGBS, New York, N. Y. (315.6), 10-10:10 a. m., "Timely Talks"; by "Teresa"; 10:10-10:20, Helena Shepard; 1:30-1:35 p. m., Respiration reading; 3-3:30, Drawing Room Players with Genevieve Williams, soprano; 6-6:30, Uncle Geobes; 6:30-6:35, last minute news, Chamber of Commerce; 8:05-7, Jersey Reglans; 7:10-7:20, talk on camping; Major E. M. Fish; 8-9, Pathé Recording Competition; 9-9:30, Guarantees Trust company chorus; 9:45-10, Elizabeth Foster Loyal, soprano; 10-11, Senora, world-famous orchestra; 11-12, Joseph Strissoff's Hotel Vanderbilt dance orchestra.

WER, Buffalo, N. Y. (319), 2:30-4:30 p. m., afternoon musical program, A. J. Hyman, director; 8-11, jointly with WFAE, including Gold Dust Twins and Eveready hour.

WGNY, Schenectady, N. Y. (378.5), 2 p. m., "The Mouse Trap"; Harry Bond players; 2:30, Stephen E. Bolestar, organist; 4:30, New Ramona hotel orchestra; 7:30, "Early Spring Vegetation in the Eastern States"; Harry Knute Swenson; 7:45, WGNY orchestra; 8, program; 9, Brunswick hour of music; 10, "Over the Seven Seas"; 10:30, Meyer Davis orchestra, WRC; 11:30, Stephen E. Bolestar, organist.

WHN, New York, N. Y. (361.2), 12:30-1 p. m., organ recital from Loew's Loebbecke theater; 1:15-1:15, program from usage of Loew's State theater; 6:30-7, Strand Roof orchestra; 7-7:30, Wigwag club orchestra; 7:30-7:35, health talk by Dr. Landis; 7:30-8:30, Will Oakland's Chateau Stanley; 10-10:30, Mel Craig and his Hotel St. George orchestra; 11-10:13, Club Alhambra orchestra; 12-12:30 a. m., Parody club revue and orchestra.

WIP, Philadelphia, Pa. (508.2), 7 a. m., setting-up exercises; 10, daily menu talk; 1 p. m., Karl Bonawitz organist; 3, Jules Lande and his Mayflower orchestra; 4:30, "Market Hints for Consumers"; talk; 6:05, baseball talk, Monte Cross; 6:15, Benjamin Franklin concert orchestra; 7, Uncle Wigg's bedtime stories; 8, "Timely talks to motorists"; by Gene Hoyle; 8:15, Girls' glee club of the Beechwood school; 9, Ben Stad and his WIP little symphony orchestra; 9:05, movie talk, Ed M. Drowitz; 10:30, Benjamin Franklin dance orchestra.

WJAR, Providence, R. I. (305.9), 1:05 p. m., Providence City Municipal hotel orchestra; 12:05, program; 9, Eveready hour; 10, Goodrich Silver-town Cord orchestra.

WNY, New York, N. Y. (405.2), 2-3 p. m., Pennsylvania music luncheon; 8:00-8:15, Eleanor Van Der Kar, soprano; 8:45-10:30, program, American Pen Women; 10:30, WNY, N. Y. (405.2), 10-10:20 a. m., Housewives League menu, Mrs. Julian Heath; 10:30-10:30, Yvonne talk on Etiquette; 10:30-10:40, "Art for a Living"; Grace P. Noyes; 10:50-11, fashion talk, Eleanor Gunn; 1-2 p. m., Nathan Abner Hotel Pennsylvania orchestra; 2:10-3:10, Associated Press luncheon; 4-4:15, Lloyd W. Johnston, baritone; 4:15-4:30,



Emanuel Baer (left), assistant conductor of the Rivoli orchestra and accompanist for the artists who broadcast regularly every night on the Eisenhower program at WNYC, New York City. Baer will also play the piano Sunday afternoon at KYW, Chicago. George Milton Lipschultz, conductor of the Warfield Music Masters, heard three nights a week at KPO, San Francisco.

WHO, Des Moines, Ia. (528), 7:30-8 p. m., Stewart Watson, baritone; Helen Birmingham, accompanist; 8-9, program, Dean Holmes Cooper, director; 11:15-12, C. C. McKelvey, organist.

WJAD, Waco, Tex. (352.7), 8:30-10 p. m., music, Mrs. S. H. Holman, director; Fern Madbury Sitka.

WJJD, Moseheart, Ill. (382.3), 6:30-7:15 p. m., Albert F. Brown, organist; 7:15-8, Moseheart Novelty orchestra; 8-9, William Stradman, instructor; 12:15 p. m., noon day services, Rev. G. H. Kase; 4, recital, pupils of Helen Abercher; 8, WLW dinner concert; 10, concert program, to be announced; 10:30 p. m., Y. E. L. of Fort Thomas presents scene from "Daddy Long Legs"; 11, special dance program, Alvin Roddy's Music Makers.

WMC, Memphis, Tenn. (498.7), 12 m., program, O. K. Hunter; piano company; 8:30, Hotel Gayoso orchestra.

WOAW, Omaha, Neb. (526), 5:45 p. m., public news period, Eugene M. Konecky; 6, Arthur Hays, organist; 6:30, to be announced; 6:45, Ray Murray's orchestra; 9, program, Hanson-Van Brunt company Ford dealers.

WOI, Ames, Ia. (270), 12:30 p. m., college chimes; "History of Engineering"; Dean Anton Marston; 10, program, "Cherry Cays"; M. Adams; 10:30-11 a. m., "Resurrection"; Calvin H. Swigler.

WOS, Jefferson City, Mo. (440.9), 8 p. m., address, Hon. Charles A. Lee; Stuebgen College of Columbia.

WSB, Atlanta, Ga. (428.3), 8-9 p. m., Rosa L. Mathews; 10-10:30, Radio entertainment.

WSU, Iowa City, Ia. (482.8), 9 p. m., "Modern English"; Thomas A. Knott; 7:45, "Current Social and Economic Problems"; Dale Yoder; 8, national college college musical; 10, concert program, to be announced.

WTAS, Elgin, Ill. (302.8), 8-10:30 p. m., Villa Ouria night program.

contra-contralto; 11-12, Abe Luzan's Coconut Grove dance orchestra from Ambassador hotel; 11:30-12, KPO, San Francisco, Calif. (422.5), 10:10-11, KOB FWX, WAFO, WBAV, WGBR, WGLL, WGRD, WEAD, WEMC, WGST, WHA, WHAD, WHAZ, WJAD, WKAQ, WMAK, WOI, WOO, WOS, WSAZ, WSU.

Tuesday, April 21

Tuesday, silent night for: **AT9, CFCA, CHNC, CHIC, KFAB, KFKU, KFKX, KFNW, KIR, KKK, KOD, KOB, KPW, WAFB, WBAV, WGBR, WGLL, WGRD, WEAD, WEMC, WGST, WHA, WHAD, WHAZ, WJAD, WKAQ, WMAK, WOI, WOO, WOS, WSAZ, WSU.**

Eastern Time Stations

CNRA, Montreal, Can. (312.3), 8:30 p. m., program, Elizabeth, soprano; Mrs. T. J. Gunn, violinist; Blenda S. Thomson, contralto; A. C. Sault, tenor; E. Clarence Girvan, baritone; J. Bayard Curtis, pianist; A. C. Smith, tenor; CNRA orchestra.

KDKA, Pittsburgh, Pa. (309.1), 12:15 p. m., Scabro's orchestra; 6:15, Pittsburgh Athletic association orchestra; 9, Brunswick hour of music; 11, concert, Pittsburgh Post studio; 11:30, concert, Grand theater.

WJAZ, Birmingham, Ala. (331.3), 6 p. m., children's program, Amelia Burham; 7:30, Mrs. Ruth Berg Eckberg, contralto; Lucius Harris, pianist; 8, "The nucleus of Broadway"; Tom Show of 1925; 8:55, Brunswick hour of music.

WCAE, Pittsburgh, Pa. (461.3), 6:30 p. m., dinner concert, William Penn hotel; 8, program from New York; 8:30, Gold Dust Twins; 9, Eveready hour; 10, late concert.

WFDL, Philadelphia, Pa. (278), 7 p. m., Charles Yerna's dance orchestra; 7:30, N. Schellburg & Co. recital; 8, talk, Clara Ziffels; 8:05, Bonwell-Teller trio; 10:30, program, Vera's orchestra.

WCX, Detroit, Mich. (516.9), 4:15 p. m., musical program; 6, dinner concert, Book-Cadillac hotel; 8:30, program from WRC; 10, The Red Apple club, dance music and variety entertainment.

WDWF, Providence, R. I. (440.9), 8:30-9:30 p. m., dinner concert, William Penn hotel; 8, program from New York; 8:30, Gold Dust Twins; 9, Eveready hour; 10, late concert.

WEAF, New York, N. Y. (491.5), 6:45-7:45 a. m., Metropolitan tower health drill; 11-11:20, musical program; 11:20-11:30, Board of Education lecture; 11:30-11:40, musical picture forecast, Adele Woodard; 4-5 p. m., musical program, United Synagogue of America; 6-7, dinner music, Waldorf Astoria hotel; 7-7:15, Marian Cara, soprano; 7:15-7:25, talk, American Federation of Arts; 7:30-8, Socié Neodyne trio; 8-8:10, talk, Bank of America; 8:30-9, Gold Dust Twins; 9-10, Eveready hour; 10-10:30, late concert.

WEAR, Cleveland, Ohio (384.4), 7-8 p. m., Metcalf Memorial organ recital, Vincent H. Percy; 8-11, program from WRC; 10, The Red Apple club, dance music and variety entertainment.

WELI, New York, N. Y. (233), 7-7:30 p. m., club Alameda cafe orchestra; 7:35-8, Thomas Wall, tenor; 8-8:15, Isabel Heckerzon, soprano; 8:15-9, Siebert's Original Midnight Strangers.

WEEI, Boston, Mass. (475.9), 6:30 p. m., Big Brother program, Check-Niel Coffee company; Maxwell Brown Coffee string quartet; Adler's International Hawaiian trio; Dan Borace, saxophone; 8:15-9, "Brother's hour of fun and frolic"; direction of Harry

Rose Milanes, soprano; 4:30-5:30, Bernard Lovell's Hotel Commodore tea orchestra; 7-7:15, Joe talk, Frank Ole; 7:15-8, Joseph Strissoff's Hotel Van derbilt orchestra; 8-8:10, Wall Street Journal review; 8:10-8:20, N. Y. U. air college; 8:25-8:30, instrumental solo, New York Band Instrument company; 8-10, Brunswick hour; 10:10-10, Over the Seven Seas; 10-10:30, Board of Education lecture; 10:30-10:40, almanac; Stanley theater organ recital; Arcadia cafe concert orchestra; 2, Arcadia cafe concert orchestra; 4:30, Doris Casadeo, soprano; talk, Y. M. C. A. Camps; by Mildred Dougherty; 7:30, Dream Daddy's bedtime stories.

WNYC, New York, N. Y. (528), 4:30-5 p. m., children's program, Agnes Vernon; 7:30, dance program; 7:30-7:35, talk, "Theonon"; 7:35-8, dance program; 8-8:10, talk, city official; 8:15-9, instrumental program; 9-9:30, police quartet; 9:30-10, song recital; 10-10:30, Board of Education lecture.

WOO, Philadelphia, Pa. (508.2), 11 a. m., organ recital, Mary E. Vogt; 12:02 p. m., Golden's tea room orchestra; 4:30, organ recital, Mary E. Vogt.

WRC, Washington, D. C. (488.5), 4:30-5:30 p. m., tea music, Vincent Loew Hotel Mayflower orchestra; 8:45, children's hour; Peggy Albion; 8, "Show Shopping"; Leonard Hall; 8:30-9, Maryland university glee club; 9, Brunswick memory contest, WJZ, WGY, WJBZ, KJRA, KYW; 10:15, "The Political Situation in Washington Tonight"; Frederick Williams Will; 10:30, "The Music Series"; Le Paradis band, WJZ; 11:30, Mercer Davis Club Chanticleer ensemble.

WRED, Lansing, Mich. (285.5), 8:15-9:45 p. m., Rev. Carl H. DeWitt, Carl Hall DeWitt, director; M. C. Potter, accompanist.

WTIC, Hartford, Conn. (348.6), 8 p. m., mixed quartet; 8:15, Hartford Public High school symphony orchestra.

WWJ, Detroit, Mich. (352.7), 12:35 p. m., Jules Klein's Hotel Statler orchestra; 3, Detroit News orchestra; 6, luncheon concert; 8, concert from New York.

Central Time Stations

CKY, Winnipeg, Can. (384.4), 7:30 p. m., lecture, Prof. W. H. Allison; 8:15, French concert, Yvonne Thibault and party.

(Continued on page 12)

Operating and Trouble Shooting

For the Owner of Federal Models 141, 142, 143 and 144

THE Federal receiver, Model 141, is the basis for the other three models also marketed by the Federal Tel. and Tel. company, the difference between the four models being the cabinet in which the apparatus is contained. The discussion will, therefore, be based on Model 141 but the owner of any of the three models will find that it applies equally well to the apparatus in his set.

Unlike most of the sets on the market, this receiver is neither regenerative, tuned radio frequency or super-heterodyne. It is a development of the Federal Tel. and Tel. company of which they may be justly proud, as the operation is readily grasped and very little trouble is encountered. The front view of this receiver with the doors open is shown in figure 1, while figure 2 shows the rear view of the panel and the apparatus mounted behind it. The schematic wiring diagram is shown in figure 3 and the numbers used to identify the various parts are the same in all three illustrations.

There are five tubes in this receiver, two of which amplify or strengthen the incoming program at radio frequencies, one is the detector which changes the form of the incoming signals so that they will operate head receivers, and two are known as audio frequency amplifiers as they strengthen the current so that it will actuate a loud speaker. To briefly explain the above terms it should be stated that, when Radio waves strike the antenna of a receiving station, and traverse the coils connected to that antenna, the electrical current set up alternates in its direction of travel from 500,000 to 1,500,000 times per second and such rapid alternations of direction are known as radio frequencies. Energy alternating at these frequencies can be strengthened or amplified by means of vacuum tubes but, before this energy can be applied to a reproducer, its form must be changed by another vacuum tube so operated that the energy which has been alternating at radio frequencies becomes a direct current traveling in one direction only and varying in intensity at audible frequencies, from 16 to 10,000 times per second. When in this form, if applied to a telephone receiver, the diaphragm of the receiver will be caused to vibrate at the audio frequencies men-

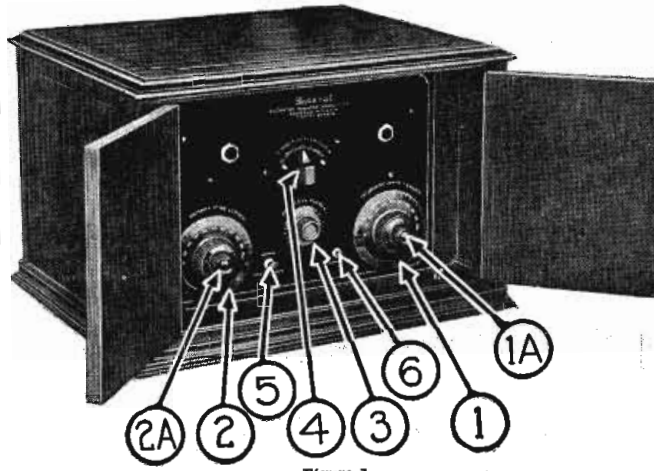


Figure 1

tioned and sounds which can be heard will be produced. Audio frequency amplification, as accomplished by the last two tubes of the receiver, consists of strengthening this energy at these lower audio frequencies. The tubes used for these three purposes are identical in structure and are interchangeable as to use, and are called by different names only to identify the purpose to which they are being put.

Tuning Operation

This receiver is tuned by dials 1 and 2 as shown in figure 1 and it is the purpose of this article to explain what goes on behind the panel when these dials are turned. Referring to figure 2, condenser 2B and coil 11 comprise an electrical circuit which can be tuned or adjusted to absorb any frequency desired. By means of condenser 2B this circuit, which is known as the antenna circuit, can be adjusted for all of the frequencies used by

broadcasting stations. When the reader turns dial 2 he is merely adjusting the antenna circuit for the frequency or wave length of a desired station. It is the purpose of coil 12 to absorb energy from coil 11, and coil 12 with variable condenser 1B form another tuned circuit which is adjusted by condenser 1B so that this circuit will be in resonance, or tuned to the same frequency as, the antenna circuit consisting of 2B and coil 11.

From this tuned circuit, signals are passed to the first tube amplifying at radio frequencies which is the tube to be inserted in tube socket 13. It will be noticed that the five tube sockets are mounted directly above a brass box which is closed and sealed. From tube 13 the signals pass to what is known as an untuned radio frequency transformer contained within the brass box, and from this

transformer the signals pass to tube 14. Here they are again amplified or strengthened at radio frequency and passed into the second radio frequency transformer, also within the brass box, from which they are passed to the tube which, in the foregoing explanation, we have called the detector. This is tube 15 in the illustrations. When the signals have passed tube 15 they are in the form of a varying direct current whose impulses occur at the audio frequencies and this energy is passed into a transformer known as an audio frequency transformer within the brass box. From this transformer signals pass to tube 16 which is the first of the two audio frequency amplifiers and from this tube the signals pass to a second transformer and finally to a second audio frequency amplifying tube which is tube 17.

Separating Stations

Going back now to coils 11 and 12, it is known that the selectivity or ability to separate stations operating on very similar wave lengths is greatly increased by turning coil 11 at an angle to coil 12. When coil 11 is turned by means of lever 4 so that its axis is horizontal there will be greater volume but there will be some difficulty in separating the programs from two stations whose wave lengths are very nearly the same. By turning coil 11 so that it is at approximately a right angle to coil 12 there will be some loss in volume but the user will find that by adjusting 1B and 2B through dials 1 and 2, he will be able to completely separate the program and enjoy one or the other. Coil 11 can, of course, be set at various angles between horizontal and vertical depending on the amount of interference which exists. So, if the user finds that two powerful stations are spoiling each other's program when he tunes in, he need only vary the relation between 11 and 12 by means of knob 4 to enjoy either program.

Knob 3 is attached to a device known as a potentiometer which is labeled 3B in figure 2. This piece of apparatus controls, to some extent, the sensitivity or range of the receiver and, in the case of nearby stations, it controls the volume.

(Continued on page 18)

The Finer Side of Radio

A Song That Reached Home

A great baritone sang with uncommon fervor to his enraptured listeners.

The melody seemed to string a golden chain of words for some responsive heart.

It reached ten times a million hearts.

For as the music faded into silence the singer said **GOOD NIGHT MOTHER!**

And then we knew that song had gone straight and true to someone somewhere in that vast invisible audience.

Someone whose tear-dimmed eye saw not the wonderful singer but a little boy whose tousled head lay on her breast.

And in that spell of mother love which makes millions kin.

All those listening hearts "tuned in" to one heart.

A heart that must have felt the magic of ten million prayers unified in one "God bless her!"

Our Bristol Loud Speaker had given us all the rich tonal quality of the singer's voice, it's natural sweetness, its pathos. It had been a wonderful evening.

5 MODELS

The cabinet shown here is of beautifully finished mahogany, 17 x 10 x 16 1/2. It has a full floating wooden horn with long expansion chamber and a high grade electro-magnetic tone reproducer. Price \$29.95. Best types from \$12.50 to \$25.00.

Send for Bulletin AY-3022

Ask your dealer to demonstrate them on the Bristol Compostopon.

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THE Improved MARV-O-DYNE is the kind of a set you have always hoped to own some day, the ideal set of your dreams. Beauty of tone and of appearance, ability to get distance, well known units—all those features this MARV-O-DYNE has.

The Improved MARV-O-DYNE, model 612-C, has more really useful improvements than any other set on the market. Take the Fil-a-meter, for instance, and the Antenna Tuning Compensator, and the push switch for reading B battery voltage. Those are only a few.

The Improved MARV-O-DYNE will endear itself to you if you only give it half a chance. We would like to have you go to your dealer today for a demonstration. The price, by the way, is only \$110. West of the Rockies and Canada, \$120.

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MARV O DYNE

The set with the Fil-a-meter!

Radio Digest

PROGRAMS
Illustrated

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Four Time Districts

EVIDENTLY everybody tries to talk at once and it is time for the chairman to bring down his gavel heavily and call the house to order, then designate who has the floor for the time being. This sounds feasible! Perhaps a few suggestions would not be out of order. On this continent we have four changes of time, one hour each. Suppose rules be set that all stations in Eastern time begin to broadcast their programs at 8 o'clock and stop at 10 o'clock Central time, the same hours, and so on. This would give an hour's difference from each time change. Those in Central, Rocky Mountain and Pacific time would have an hour to listen on eastern stations without interference. Those in Eastern and Pacific time would have an hour at the end for Central and Rocky mountain station reception, and so on.

These hours will always be the best. Then most people will be listening in at their sets. Daylight hours and after 2 a. m. Eastern time, any broadcaster could have full swing to satisfy the all-night hound and "getting through" operator.

Such an arrangement would necessarily have to be worked out by the government and strict rules applied and enforced. Mutual cooperation is good as far as it goes, but it doesn't go far enough.

Audience of the Church

MUCH of the objection to broadcasting church services are identical with those of the theater, and is only a speculation, not justification by sound conclusions. Radio is growing in popularity and usefulness and the church as well as the theater must fit themselves to the new mode of dissemination. Radio is not a plaything. It has invaded the homes of the nation and has brought cheer to many who are far removed from churches and the theater.

It is quite evident that Radio is keeping countless people at home. It is bringing delight to the shut-ins and to those in isolated places. It has stimulated scientific research, setting the grey matter of thousands of people to work along lines that never before appealed to the masses, and instead of being a detriment to the church or theater it is working in conjunction with the best there is in them for the good of humanity, and the time will come when Radio will be counted among the greatest of blessings that science has bestowed upon mankind. If it keeps a certain few away from church it brings the influence of that institution to thousands who have not made a practice of going to church. If discussion and difference of creed separate people and classes these differences are being bridged by the Radio, whereby those of different faiths may get the viewpoint of others, and while there may be a few more empty pews the audience will be very much larger.

Miracles of Radio

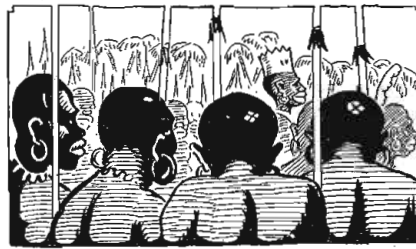
SOME people call Radio a miracle. The ones who know most about Radio are expecting most from it. While scientists agree that it is still in its infancy most of us would like to know when it is to have its youth. We know little of the miracles that are enacted before us every day. We may find that we have known such a little about Radio at this time that it will make us feel foolish in the years to come. Even at that we doubt that any one person will be able to fathom the entirety of this science and will be able to tell us exactly in terms understandable just what takes place when the voice is presumed traveling through the air.

"Let's Do It Again"

AFTER receiving a stack of mail in which the listeners penned their appreciation, Francis MacMillen famous American violinist, said, "Let's Do It Again." It stands to reason that MacMillen has gained a listening audience that will respond readily whenever the chance comes to hear and see him in person. He has created a ticket buying public for future recitals wherever he may appear.

RADIO INDI-GEST

Tom-Tom's Sounded in Walla Walla



WALLA WALLA.—(via Radio.)—Long before day-break this morning, the villagers in this town were awakened by the rhythmic throbbing of the tom-toms in the hills. Messengers dispatched into the bush to find the cause of the drumming, reported that the hostile tribe on the opposite side of the island were holding a big pow-wow to raise funds for a broadcasting station. This will tend to show our readers some of the obstacles and obstructions that have been put in the path of Indi Hissel, to prevent the opening of Station BLAH. If physical force is necessary to subdue the opposition, Chief Kokomo, that brave and dauntless leader of the Walla Walla tribe, will endeavor to carve his initials into the hides of some of the enemy. That is a favorite pastime of the chiefs. He's so playful!

A message has been received by the U. S. Steal Corp., to the effect that they will supply antenna towers if they are given free publicity from the station. Positively NOT! This station will not accept bribes—or brides—for such a thing. However, if we like you, you can get anything that you want for nothing—it will be worth just that.

Staggering evidence (not liquid) that the opening of Station BLAH, with their super-bum equipment will take place next week, has been reported. Shaka Little (we printed her picture last week) will be on the opening program, as will her cousin Duk Hula, also an oscillatory dancer, from the opposite end of the island.

Be sure to get your next week's copy of Radio Indi-Gest, to follow the programs from this station.

The Pipes of Pan (Brought Up-to-Date)

I hear the Pipes of Pan in tune
The better 'neath a silvery moon—
Unless it's o'er a Radio
That belongs to a maid I know.
Together on her couch we sit
And hear the Pipes of Pan o'er IT.
The couch springs form an aerial
That seem to answer fairly well!
GEO. A. WRIGHT.

Lodge's Prayerful Cat Annihilated

De-ah Indi: Sir Oliver Lodge, this country's foremost living Radio scientist, says that "to the cat mewing at the door it may be a miracle in answer to prayer when it is let out."

This is both to underestimate the cat's intelligence and to seek fantastic reasons for simple phenomena. If there is no one about the cat will not mew at the door. If there is anyone about it will not only mew—it will look most appealingly at the person who, it has intelligence to know, can open the door; and some extra intelligent cats can open doors for themselves—and they don't waste time in mewing.

No, I don't think Sir Oliver has studied cats as well as he has done Radio!
LUN DUN KAT.

It's Always the Way

I use a lot of gump and guff
When next door neighbor does his stuff,
He's but a diamond in the ruff,
I bluff.

I tell myself he doesn't mean
By squeal and squawk to vent his spleen,
His virtue's fat, his faults are lean,
I wean.

But Oh my Lord! When I want peace,
He's ALWAYS reaching-out for Greece,
Or demonstrating for his niece—
"Soo loud lak dees."

I try, I say, I try but yet,
I het some day, I bet, I het
I get a super hetro-het,
And then Oh Lord!

I'll vaccinate that neighbor's air,
I'll make her rear n' rave n' tear,
I'll make him eltown and tear his hair,
For fair.

Oh yes, I try, I say, I try,
To see the virtue in his eye,
But, God forgive, I couldn't cry,
If he should die!

W. RUSSELL LEWIS.

It Paid for the Privilege

Dear Indi:—When the electricity failed at Maidstone, Eng., recently and the post office carried on by candle light, a clerk in the semi-darkness accidentally issued a dog license in lieu of a Radio license. Ever since, they say, the applicant's set has been howling continuously.
A. C. B.

Give Him Laws and Funds



Condensed By DIELECTRIC

I have found out what I dislike about KFI. With superfine equipment and very wonderful programs the whole effect is spoiled by what I would term poor announcing. Instead of announcing the title of a selection and the person who will sing or play it the announcers at the Antbony station invariably go on and throw in a few complimentary remarks about the artist. This no doubt sounds very nice to the artist but it does not help her or she to "go over" with the audience as this sort of bouquet throwing leaves a bad taste and really makes it harder for the artist. More sales resistance the psychologist would say. A number of announcers around the country cleverly pay tribute to an artist's offerings after the selections have been played and KFI should fall in line. It is better.

Our old friend at Jefferson City, Mo., Station WOS, saw to it recently that piano selections from among the classics and played by competent musicians should continue a part of their programs. It is unnecessary to single out any one, in preference to any other, composition for laudation but if it were done, then the Chopin nocturne would surely receive special mention. Such playing aids broadcasting.

I had my watch before me and pencil and pad ready to note the call letters and time between announcements of them—when I was called away from the set and missed a golden opportunity to present a culprit to you. For exactly forty-three minutes I listened to a program with no chance to identify the sending station. It was a low meter station and I'm going back to get 'em. Maybe they're not worth it. Let's see!

While the programs prepared and transmitted from Station WMH, Cincinnati, are not exceptional to any degree they do meet the level of ordinary requirements and undoubtedly provide pleasure for large numbers of Radio listeners. Happening in on one of many calls I listened to "Rose Marie" and as the orchestra finished remarked the freshness of its presentation, differing in that respect from other renditions of it.

One of the dependable stations for instrumental entertainment is WTAM, Cleveland, Ohio. There you may go most any time to listen to either dance music or more serious material. If the Stalter concert orchestra is on the program you may well be assured of being pleased. Your reception of the station should be beyond criticism, in so far as the broadcasting is concerned, for this is a battery transmitter.

Other features besides the Marine Band are broadcast from WCAP, Washington, D. C. Quite a pretentious program was prepared for the Radio audience of this capital station when the Catholic university glee club sang into Mike, with the possibility of many thousands of listeners noting the quality of the tenor choir.

Barber shop quartets are no more enjoyable when heard by Radio than from otherwise quiet and deserted streets. Some there be on the air at times. Tune them out, for there are provided good quartets such as that male quartet entertaining through Station WSAI, Cincinnati. Ensemble, tone coloring and regard for the meaning of songs cause these organizations to stand out above their fellows. Let me remark again that mediocrity in entertainment is rapidly losing caste in Radio circles.

Four Filter Eight Tube Super-Heterodyne

Part VII—Testing and Trouble Shooting

By Jacques Fournier

THERE is one more possibility of improving results. The tubes should be shifted around in the sockets and it will be found that two of the tubes work better as detectors while three of the remaining six perform better as intermediate amplifiers than do the others. Of the other three tubes, one will be found to be a better oscillator, which leaves two for the audio frequency amplification. Practically all tubes will give fair results as audio frequency amplifiers but care should be taken first to get the best detectors, second to get the best intermediate amplifiers, third the best possible oscillator and last the audio frequency amplifier.

Testing the Circuits

If, after carefully checking the wiring and shifting tubes, there is no response at the loud speaker when tuning is tried, it will be necessary to test the various circuits of this receiver to determine whether there is a break either in one of the instruments or in the wiring. For this purpose, either a single dry cell or three cell C battery may be used with the head telephone receivers. One of the cord tips from the head phones should be connected to one side of the battery and a wire about two feet long should be connected to the other side of the battery. When testing, all batteries should be disconnected from the set, and the loud speaker also. Figure 20 is shown with this article, with letters identifying various points in the circuit, so that the writer can tell you where to connect the testing leads.

We will start at the input end of the receiver and check through to the output which will enable us to catch every circuit in the process. To determine whether the secondary of the antenna coupler and the two circuit Jack are O. K., touch one of the leads from our testing equipment to point C, as shown in figure 20, which is the connection to the rotor plates of the midset condenser, and connect the other to point B, which is one side of the grid leak in the grid circuit of our first detector. This will also include the pick-up coil of our oscillator coupler. If there is

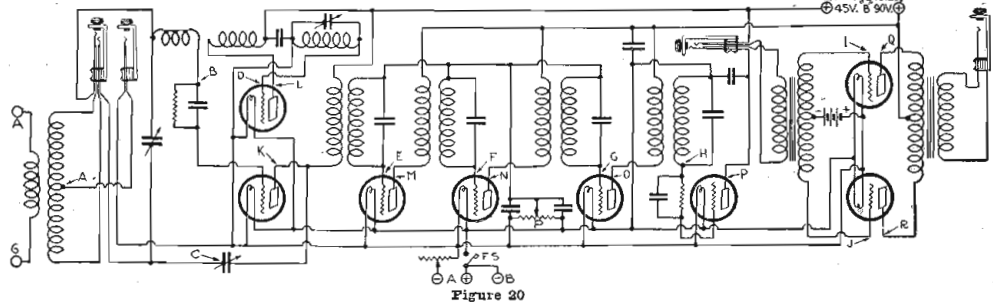


Figure 20

no click, when our circuit composed of head phones and battery is completed by connecting to points B and C, either the secondary of our antenna coupler, the two circuit Jack or the pick-up coil is defective. Now turn the filament rheostat clear over toward maximum and, to test the grid circuit of the oscillator tube connect one of the test leads to point D, which is the grid terminal on the oscillator socket, and the other to the minus A battery binding post. This will show whether the grid circuit is complete as far as the inductance is concerned, but will not, of course, give any indication whether the connections to the oscillator variable condenser are complete. To test the connections through the plate coil of the oscillator coupler touch the test leads to point L and the plus 45-volt binding post. To test the connections from plate of the first detector, through the primary of the first intermediate transformer, connect the test terminals to the P binding post of the first detector socket and the plus 45 binding post of the set. The P terminal of the first detector socket is indicated in figure 20 as point K.

Testing Transformers

The secondary of the first intermediate transformer can be tested by connecting

the test terminals, one to point E, which is the grid post on the first intermediate amplifier tube socket, and the other to the center binding post on the potentiometer P. The click on each of these tests should be clear and sharp, and almost as loud as the click produced when the terminals are connected together without any apparatus in the circuit. The grid circuits of the other two intermediate amplifiers may be tested by connecting one side of the test circuit to the center tap on the potentiometer and the other side of the test circuit to points P and G, as shown in figure 20. The secondary of the last intermediate transformer and the entire grid circuit of the second detector may be tested by turning the filament switch to the "On" position, connecting one side of the test circuit to point H and the other side of the test circuit to the plus A binding post of the receiver. The plate circuit of the second detector, which will include the two circuit Jack and the primary of the input push pull transformers, may be tested by connecting to point P, which is the P terminal of the second detector tube socket, and to

the plus 45 binding post of the receiver. The secondary of the input transformer of the push pull system is tested by connecting one side of the test circuit to the center tap of that transformer and touching the second terminal of the test system to either point I or joint J, as shown in figure 20. Another way of testing this same circuit would be to touch the test wires to points I and J only, as between these two points one has the entire secondary. In the first method one has only half the secondary under test at one time.

The primary of the output transformer is tested by connecting one side of the test system to the center tap and the other to point Q, or point R; the second method would be to touch the terminals to points Q and R only. The secondary of the output transformer is tested for continuity by touching the test terminals to the frame and the spring of the open

(Continued on page 20)

SOMETHING WORTH KNOWING!

One reason that leading builders of fine sets use more Thordarsons than all competitive transformers combined is because EVERY Thordarson amplifies evenly over the entire musical scale. Thordarsons run absolutely uniform; always "match up" perfectly. And why shouldn't they? Aren't they made and unconditionally guaranteed by the world's oldest and largest exclusive transformer makers—transformer specialists for 20 years! For the finest explanation to be had at any time, follow the lead of the leaders—build or replace with Thordarsons. A. P., 2-1, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100. All dealers. Thordarson Electric Mfg. Co., Chicago.

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- Radiodyne**
- THERMIODYNE**
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- QZARKA**
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- AUDIOLA**
- GLOBE**
- SAAL AND MANY OTHERS**

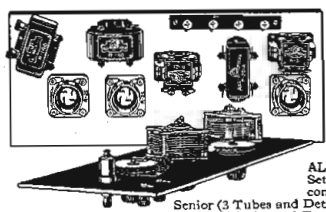
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use
THORDARSON
SUPER
TRANSFORMERS

Tour the Air

using your ALL-AMAX SENIOR which will carry you farther and more rapidly than any airplane. ALL-AMAX Sets are mounted at the factory but not wired, saving you half the price. Wire your ALL-AMAX in one evening and take your first tour the same night.



WIN an ALL-AMAX by submitting a SLOGAN—Ask at your favorite radio store.



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The New Radio Key Book, just off the press, contains a wealth of practical information for radio listeners and experimenters. It illustrates an eight-tube set which is the sensation of the year, and shows many other approved hook-ups. Send 10 cents, coin or stamps, for your copy.

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THE SILENT FRANCE MULTI-DUTY SUPER-CHARGER

Knows No Equal

IN DEPENDABLE performance, quietness, economy and freedom from trouble, the France Super-Charger is in a class by itself. No sticking or sparking contacts, no bulbs to break, no acids to spill, no fumes—it is truly the ideal charger for home use.

The France Super-Charger charges up to 120 volts of "B" battery IN SERIES. It also charges 2, 4, 6 or 8 volt "A" or automobile batteries at a 5 to 7 ampere rate, tapering as the battery is charged.

Price of Super-Charger, \$22.00; West of the Rockies, \$23.00; Canadian prices furnished upon request. Write today for literature and name of nearest dealer.

Dealers and Jobbers: Write today for discounts and details of our co-operation in selling this charger.

The FRANCE MFG. CO.
10329 Berea Rd. Cleveland, Ohio

HOW TO OPERATE SET

(Continued from page 15)

It is desirable, for the sake of range, to operate the first tube in a condition known as "regenerative," at which point its efficiency as an amplifier is very high but,

warns one that the first tube has gone into oscillation.

Figure 2 shows the battery connections for the Federal 141. The binding posts are all on the rear of the receiver cabinet and no internal connections are required. After the receiver has been provided with a

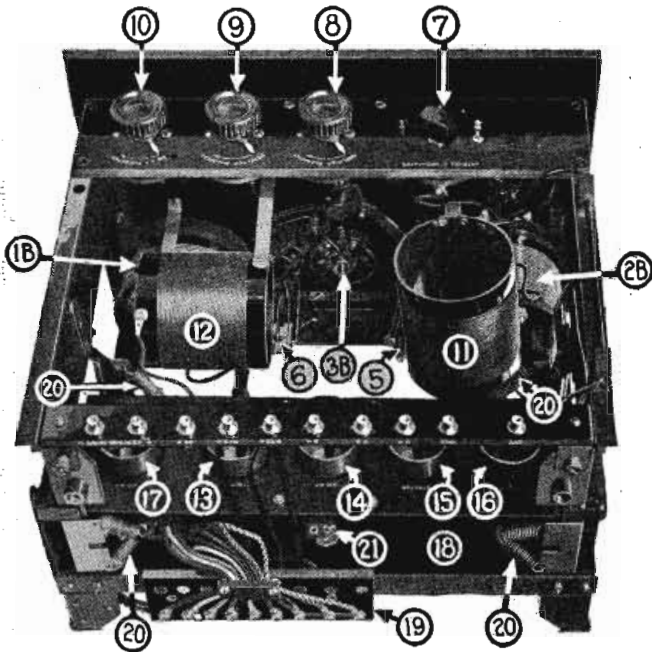


Figure 2

if the means of controlling the regenerative condition is carried too far, a different condition is entered known as "oscillation" in which state the tube is useless for the purpose employed. By turning small dial 3 the efficiency of the first tube is increased more and more and regeneration is attained, and recognized by a hissing sound which becomes greater as the small dial is turned, until a click or thud

good antenna and a good ground connection, and the batteries have been connected properly. Inspect the installation as follows:

Inspection

Insert the phone plug into the phone jack 5 at the bottom of the panel and listen in with the phones while the "Am-

plification Control" 3 (potentiometer) is rotated. A thud or hissing sound should be heard. All the amplifying tubes when used in the "First R. F." stage should produce such sounds when the "Amplification Control" is rotated. Those tubes which do not produce such sounds are de-

ceiver, then trouble can be attributed to either of the latter two. After tuning in a station, remove the antenna wire and notice if the volume of the received signal is decreased or increased. If it is decreased, the indications are that the antenna is all right. Now repeat this operation with the

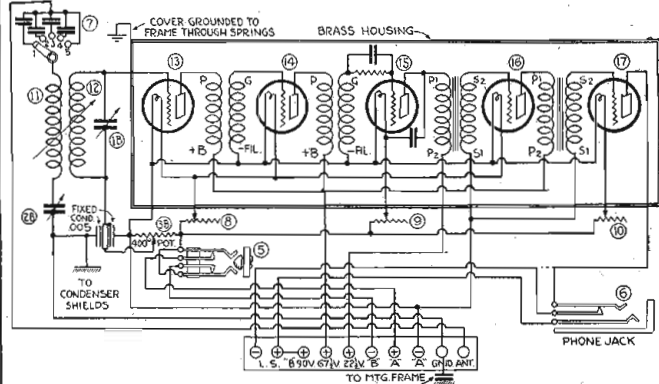


Figure 3

fective and should be replaced. For the "First R. F." and "Second R. F." stages choose those tubes which best conform to the above test. The 200 type tube (clear glass), for the "Detector" position only, should produce a distinct hissing sound when turned up brightly. If it does not it is defective. It should be operated just below the hissing point.

Remove the antenna and ground wires from their respective binding posts 22 and 23 on the rear of the cabinet. Connect these two binding posts together with a wire and turn the "Amplification Control" all the way on to the right. Now, no matter what the position of the Secondary Wave Length Dial 1, a click should be heard at some point if the Antenna Wave Length Dial is turned through the full scale. Remove the wire from between the antenna and ground binding posts and replace the antenna and ground wires.

If the receiver performs as described, and poor results are obtained with the antenna and ground connected to the re-

ground wire. If the removal of this wire does not produce any change in the volume, the ground connection is defective and a better one should be provided. The same is true of the antenna if its removal produced no change in volume.

Antenna Compensation

Having assurance that the receiver is in operating condition, we may proceed to adapt the antenna to the receiver. This operation is known as "compensating the antenna." Set Selectivity-Volume switch 4 and Amplification Control 3 as far to the right as possible. Secondary Wave Length Dial 1 between 80 and 90 and Antenna Compensator 7 at 1.

Start Antenna Wave Length Dial 2 at 0 and rotate slowly toward the higher numbers until a distinct click or rushing sound is heard. Note the dial setting where this sound occurs. If no click or rushing sound is heard, set the Antenna Compensator at 2 and repeat. This process should be repeated with each of the five (Continued on page 20)



SIMPLICITY

Volume, tone, selectivity, clarity, these are the standards of radio operation of last year. They are universally duplicated, taken for granted in any five tube set and no longer are the vital point of excellence. Just as automobiles passed from stair climbing tests to simplicity of control, so the radio has progressed from the gymnastics of operation to that of simplicity of control.

Answering this demand, the Meco Radio Receiver has only two dials, only one dial to log, making it easier of operation for the novice, more convenient for the radio veteran.

FIVE TUBES TWO DIAL CONTROL

Five Tubes provide the range, selectivity and clarity of tone that is to be expected from a superior set.

Made in three models, cabinet and console by the manufacturers of famous Meco Tubes. Sold by dealers everywhere, supplied by recognized Radio Jobbers.

Write us for the name of our dealer nearest you.

Metropolitan Electric Co.
DES MOINES, IOWA



Lincoln
Collapsible LOOP AERIALS



"Europe with Lincoln Loop" writes Radio Expert

W. W. Roberts — Manufacturer's Agent and Radio Expert—Norfolk, Va., wrote us March 17, 1925:

Gentlemen:
Please send me by parcel post to P. O. Box 650, Norfolk, Va. the following:
Two (2) Lincoln 4 Point Tapped Loop Aerials.
Ship the above C. O. D. in view of the fact that I am not known to you.
It may interest you to know that I have official Radio Broadband confirmation of European Trans-Atlantic Reception during the recent tests and that I used your Lincoln loop for this reception.
Very truly yours,
W. W. Roberts.

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Circulation Department

Radio Digest

510 N. Dearborn Street Chicago, Illinois

A. B. C. Course in Radio Fundamentals

Chapter IV—Operation of Direct-Current Generator and Motor

By David Penn Moreton

IF AN electrical conductor be moved across a magnetic field, as shown in figure 18, there will be an electrical pressure induced in the conductor. This pressure is supposed to be due to the conductor cutting across the magnetic lines of force that are supposed to constitute the magnetic field. When the conductor is moved in such a manner that there is no cutting of the magnetic lines of the field, as shown in figure 19, there will be no electrical pressure induced in the conductor.

The value of the electrical pressure induced in the conductor depends upon the rate at which the conductor cuts across the magnetic line. If one of the magnetic lines of force is cut in each second as the conductor is moved across the magnetic field there will be one absolute unit of electrical pressure induced in the conductor. The absolute unit of electrical pressure is a very small unit as it requires 100,000,000 of them to be equal to the practical unit of pressure, or one volt. The conductor must then cut the lines of force at an average rate of 100,000,000 during each second of time in order that an electrical pressure of one volt be induced.

The movement of a conductor in a magnetic field, as shown in figure 18, is the fundamental principle upon which all dynamo electric machinery operates.

Direction of Electromotive Force

The direction of the induced electromotive force in the conductor will always have a definite relation to the direction of the magnetic field and the direction in which the conductor is moving. A simple rule for determining the relation between these quantities, known as the right-hand or generator rule, is to place, the fore finger, middle finger and thumb of the right hand at right angles to each other and the hand in such a position that the fore finger points in the direction of the magnetic field and the thumb in the direction in which the conductor is being moved then the middle finger will point in the direction of the induced electromotive force. An application of this rule to figure 18, indicates that the direction of the induced electrical pressure will be along the conductor toward the observer. If the direction of motion of the conductor be reversed, the direction of the magnetic field remain unchanged, there will be a reversal in the direction of the induced electrical pressure.

The movement of the conductor back and forth across the magnetic field, as shown in figure 18, would result in the induced electrical pressure being in one direction part of the time and in the reverse direction for the remainder of the time, assuming the conductor does not move entirely out of the magnetic field at any time. Such an induced electrical pressure would be called an alternating pressure because it alternates in direction, and the current produced in a closed

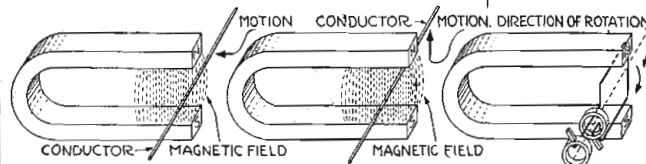


Figure 18

Figure 19

Figure 20

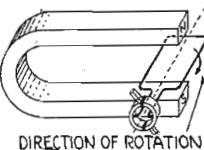
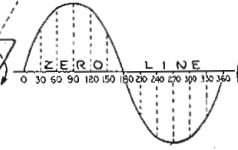
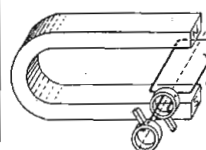


Figure 21

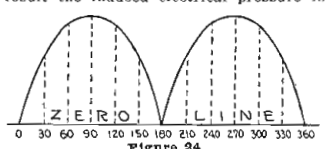
Figure 22

Figure 23

circuit by this pressure would be an alternating current.

Rotating the Loop in Magnetic Field

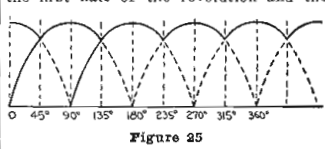
The conductor is usually bent into the form of a loop of wire and then rotated in the magnetic field as shown in figure 20. Continuous connection is made with the terminals of this loop of wire by means of two stationary brushes which rest on two metal slip rings connected to the terminals of the loop. When this loop is in the position shown in figure 20, the two sides of the loop are moving perpendicular to the direction of the magnetic field, and as a result they are cutting across the magnetic lines of force at the greatest possible rate and as a result the induced electrical pressure in



the two sides of the loop will have its greatest value for this position of the loop. There will be no electrical pressure induced in any part of the loop outside the magnetic field or in any part of the loop that is not cutting the magnetic lines.

When the loop has the position shown in figure 21, the two sides of the loop are moving parallel to the magnetic field and as a result they are not cutting the magnetic lines and no electrical pressure will be induced in them. For all positions between the horizontal and vertical positions, the induced electrical pressure will have a value between zero for the horizontal position and the maximum value for the vertical position.

When the loop moves from one horizontal position to the next horizontal position, or one-half revolution, the two sides of the loop will cut across the magnetic field in opposite directions and the induced electrical pressure in the two sides will be in opposite directions with reference to the front and back ends of the loop, that is the electrical pressure in one side will be toward the back end of the loop and in the other side toward the front end of the loop. These electrical pressures, however, act in the same direction around the loop and will assist each other. For the next half revolution of the loop the two sides of the loop will be moving in opposite directions across the magnetic field to what they were for the first half of the revolution and the



induced electrical pressures will both be in the opposite direction. The electrical pressures, however, both act together around the loop but in the opposite direction to what they did for the first one-half revolution. If the electrical pressure induced in the loop was determined for successive positions, a curve could be drawn which would show the variation in electrical pressure for different positions of the loop. Such a curve is shown in figure 22. A part of the curve is drawn above the zero line and a part below as to represent the fact that the electrical

pressure is in one direction part of the time and in the opposite direction part of the time. The markings along the zero line correspond to various positions of the loop measured in degrees from a position of zero induced electrical pressure or with its plane perpendicular to the magnetic field as shown in figure 21. Values below the zero line the commonly referred to as being negative and those above the zero line as being positive.

Positive and Negative Values

A complete set of positive and negative values, as shown in figure 22, constitute what is called a cycle. If sixty of these cycles are completed in one second, that is if the coil rotates sixty times in one second, the induced electromotive force is referred to as a sixty-cycle electromotive force.

An alternating-current electromotive force will produce an alternating current in a closed electrical circuit but the laws for an alternating-current circuit are quite different from those for the direct-current circuit already discussed.

An alternating current is not suitable for a great many purposes such as electroplating, charging storage batteries, etc., so that the electrical pressure induced in the loop of wire must be changed to an unidirectional or direct-current electrical pressure.

If a single slip ring be divided into two equal parts and the parts insulated from each other and these two parts be connected to the terminals of the loop and two brushes be placed in contact with this ring and opposite each other as shown in figure 23, the following results will be obtained when the loop is rotated. The brushes are so placed on the slip ring, or commutator as it is more commonly called, so that they move from contact with one part of the ring to contact with the other part when the loop has zero electrical pressure induced in it. As a result of the brushes changing contact with the segments or parts of the commutator when the electrical pressure is zero, there will be a unidirectional or direct current pressure between the brushes. The electrical pressure may now be represented by a curve such as the one shown in figure 24. A direct current pressure of this kind is usually called a pulsating pressure because it pulsates in value at regular intervals. Such a pressure is not suitable for charging storage batteries, as the battery would discharge when the pressure was below the voltage of the battery.

If another loop of wire be placed at right angles to the first one and a four-segment commutator used instead of a two-segment one the pressure between the brushes can be made nearer constant in

(Continued on page 20)

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The Greatest Achievement in Radio Since the Advent of the Super Broadcast Station

The Kane Antenna eliminates all power noises and most all the squeals from regenerative sets. It filters the air bringing music to your set as it leaves the broadcast station. What more can you ask?

Enjoy your set the year 'round. No need to lay it up in the summer. The KANE ANTENNA TAKES CARE OF ALL DISAGREEABLE NOISES. You have invested a lot of money in your set. Why not give it a chance with a good aerial. Your car will run on distillate, but how much better does it run on a high grade of gas? So with your radio set. It will operate on most any old aerial, even the clothes line or bed springs, but just hook it on to a KANE ANTENNA, and HEAR AS YOU HAVE NEVER HEARD BEFORE.

THE KANE ANTENNA makes all sets good sets, makes listening a pleasure and not a pain. If you are not troubled with power noises the KANE ANTENNA WILL GIVE YOU BETTER RECEPTION. Read the following letter from Dr. C. Hale Kimble of Spokane, Wash., then order your Kane Antenna and enjoy radio as he is doing.

Gentlemen:

Completed Kane Antenna with installation according to your plans last evening. One hour after connecting to my set just west of Pittsburgh and many other eastern stations never logged before, clear and distinct. Could not get Eastern stations at all before. Your antenna has completely eradicated this. Last night no one could get even the Coast stations because of this interference, but I had them clear and without noise of any kind—first time I have ever been able to do this.

It makes machine very selective. Can shut out two Super stations on nearly same wave length with one-half a degree dial adjustment. I am delighted with it and unreservedly recommend it to all radio fans.

DR. C. HALE KIMBLE, Suite 406 Hutton Bldg., Spokane, Wash.

If you prefer to build your own antenna, or would like to look over the full working drawings of the Kane Antenna, just enclose a dollar bill and we will send you a complete set of working drawings and instructions for erecting. These drawings will be accepted back by us at full purchase price on an order for an antenna.

The Kane Antenna is now sold only from Factory to consumer. Only one small profit instead of three, the consumer getting the benefit of the price.

The Kane Antenna is made in two styles. The regular for all sets other than R. C. A. Super Hets. Price, **\$13.00**

The Special for R. C. A. Super Hets only, \$6.50

Full working drawings (stamps not accepted) \$1.00

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THE KANE ANTENNAE CO., Aberdeen, Wash.

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A. B. C. RADIO COURSE

(Continued from page 19)

value. The brushes are placed in such a position that they make contact with the segments connected to a particular loop while the loop is moving from a 45-degree position on one side of a plane parallel to the magnetic field to a 45-degree position on the other side of this plane. This results in the brushes changing from the segments connected to one loop to the segments connected to the other loop each 90 degrees that the loops rotate. The electrical pressure between the brushes will then have the form shown by the heavy line in figure 25. The variations in the pressure can be reduced by increasing the number of loops and segments in the commutator.

The loops of wire and commutator correspond to what is called the armature of a generator. The magnetic field is usually produced by an electric current rather than by a permanent magnet. An armature of the type described above is called an open-circuit armature because the loops are only useful when the commutator segments of that loop are in contact with the brushes. When

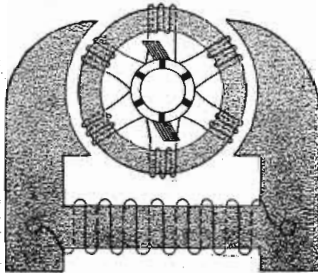


Figure 26

the loops of wire are all interconnected in such a manner that they are all useful in producing an electrical pressure the armature is called a closed-circuit armature. An armature of this kind with six loops or coils is shown in figure 26.

In figure 26 the loops are wound around an iron ring which provides a mechanical support for them, and also a better conductor for the magnetic lines. An armature of this kind is usually called a ring armature.

Most of the armatures are of what is called the drum type, and is, the winding is placed around an iron core which has a drum shape and both sides of each turn are on the outside of the drum.

If a current be sent through an armature, like the one shown in figure 26, from an outside source, such as a storage battery, the armature will rotate in the magnetic field and the machine will be a motor. The direction of rotation of the armature of the motor will be opposite to what it was for the generator if the magnetic field and armature current

are both in the same or both in the opposite directions for the motor to what they were for the generator. The left hand or motor rule may be used in determining this relation. This rule is applied in the same way as the generator rule except you use the left hand.

(The alternating current circuit in regular electric machinery is analogous to that of Radio reception and its simple explanation relative to the electric dynamo will be easily understood by the beginner in Radio.—Editor's note.)

HOW TO OPERATE SET

(Continued from page 18)

Antenna Compensator settings. The setting of the compensator which produces the highest reading on the Antenna Wave Length dial is the correct compensator setting for the antenna being used and will not need to be changed unless the receiver is used on a different antenna. It will not be necessary to adjust the antenna compensator again unless the antenna is changed.

To tune the Federal 141 proceed as follows: First, set 4 so that pointer is at extreme right, 3 to the extreme left and 2 at about 10 on the dial. With 1 at any point between 5 and 90, rotate 3 to the right until a click is heard in the phones or loud speaker. Turn 1 slowly until a station's carrier wave is accurately located. Turn 2 slowly until the click is heard again. This time the click will be followed instantly by the music or voice. Improvement in quality and volume, if necessary, may be obtained by accurately adjusting 1 and 2 by means of the verniers 1A and 2A and by carefully advancing 3 a trifle toward the right.

A carrier wave is represented by a whistle. This whistle is not loud, but is distinct and will, as 1 is rotated, vary from a shrill note to a low weak tone and then back to the shrill note. Always stop the dial at that point where the whistle is lowest in tone; never in the shrill tones. The exact center of this low pitched tone is the correct position for 1.

If a powerful station is near by, greater selectivity may be had by moving 4 toward the left and then tuning for the desired station. When operated as above, Federal Type 141 gives surprising results in distance, volume, selectivity and tone quality. By writing the settings of Dials 1 and 2 on the log card which is furnished with the receiver, the corresponding stations may be tuned in again by returning

the dials to these positions. In this case 3 should always be started at the left and rotated to the right until the desired volume is obtained. Always make accurate adjustments with verniers 1A and 2A.

(The radically different Super-Zenith VII will be presented next week with circuit diagram and photograph of the internal assembly. Correspondence from readers indicates unusual interest in this Zenith receiver which, due to its variable coupling radio frequency transformers, is a distinct advance in the progress of tuned radio frequency amplification.—Editor's Note.)

FOUR FILTER SUPER

(Continued from page 17)

circuit jack, which is at the extreme right end of the panel.

Test for Fixed Condenser

Unfortunately, fixed condensers cannot well be tested while connected in the set, and to determine whether any of the condensers are defective it will be necessary to remove them from the receiver. To test fixed condensers after they are taken from the set it is only necessary to touch the two terminals from our battery and headphones to the two sides of the condenser and, if there is a "short" within the condenser, the same click will be produced as is noted when the two terminals are connected directly together. If the condenser is good, there will be a very faint click, but it may be readily distinguished from the strong click produced when the condenser is omitted from the circuit. Grid condensers may be tested while still in place in the set by removing the grid leak cartridge and touching one side of the test system to the G terminal on the socket and the other side to the condenser connection away from the socket.

It is very easy to connect the oscillator coupler in such a way that oscillations are not produced, and one suggestion, if signals are not heard, is to carefully check the connections to this coupler to be very sure that the connection from the P terminal of the oscillator socket goes to the lower end of the center coil, the upper end of this center coil to go to the plus 45 B binding post. The lower end of the top coil should be connected to the rotor plates of the oscillator variable condenser and to the negative filament wire; the upper end of this top coil must be connected to the G terminal on the oscillator tube socket and to the stator plates of the condenser. It is conceivable, but not likely, that none of the 8 tubes

are ready oscillators on 45 volts, so if, after all other tests fail, oscillations are not produced, the upper end of the center coil should be disconnected from the plus 45 B binding post and connected to the plus 90 circuit. This can best be done by connecting it to the wire which goes down through hole 30 from the intermediate amplifier unit, at the point where this comes out on the underside of the sub base. That is the nearest point at which the plus 90 circuit comes to the oscillator coupler.

Condenser Variations

Most of the loops on the market are designed to work with .0005 mfd. variable condensers, but it may be that either the loop used has too many turns or the condenser is of slightly greater capacity than .0005. If either is the case, it will be found that KSD and KYW come in at about 80 on the loop dial, and if this proves to be so in actual use, the inner turn of the loop should be removed. This will bring the two stations mentioned at a higher point on the dial and will probably put them about where they should be, at 92 or 96 on the dial. If, on the other hand, the condenser is a little "light," that is, does not come up to full .0005 mfd. capacity or, if the loop does not have quite enough turns, it will be found that with the condenser at 100 on the dial you are unable to get above stations at 435 or 500 meters. If this proves to be the case, another turn should be added at the inner end of the loop, which will move stations down the dial and should bring in KYW and KSD. If one turn does not prove enough, a second turn should be wound at the center of the loop.

The same facts apply to the oscillator grid coil and the oscillator variable condenser: If the higher wave length stations come in below 88 or 90 on the oscillator dial one or two turns should be removed from the grid coil of the oscillator coupler, which is topmost coil while, if one is unable to get above 500 meters with the condenser at maximum setting, one or two more turns should be added to this coil. If all variable condensers had exactly the same maximum capacity of .0005 this adjusting would not be necessary, but it happens to be the case that many condensers only go up to .00046 while many show, on test, a maximum capacity of .00053.

The "Goode" Two-o-One



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Change Regenerative Receiver to R. F.

Rheostat, Socket and Tube Are Parts Needed

So many kicks have been voiced of late about regenerative detector circuits, and so many ways have been tried out to add Radio frequency to the sets, and all with

WORKSHOP KINKS EARN A DOLLAR—

THERE are many little kinks worked out at home that would aid your fellow Radio worker if only he knew about them. There are new book-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

an effort to simplify, so that the sets the fans now have may be readily changed by the owners, that it is impossible to follow them out and get any desired results. I had much hopes of seeing something that I could use easily, but failing to do so, I set about building something to fill the want. The first circuit shows how I accomplished what seemingly was a difficult job.

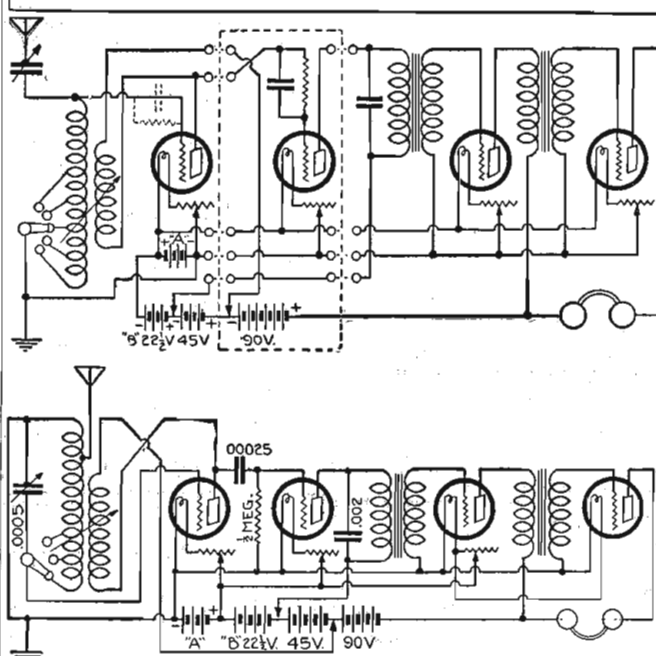
All the parts extra to change a receiver from an ordinary regenerator to a tuned Radio frequency set is a vacuum tube, a socket and a rheostat. In most cases these parts will find plenty of room in the set for them.

An old regenerative circuit with the Radio frequency added is shown in the space outlined by the dashed lines. The wire that connects the rotor and audio transformer is disconnected and is connected direct to the 45 volts of the B battery, never more than 67 volts. The grid condenser and leak is removed and the grid and coil are connected direct. The grid condenser and leak are now connected between the plate connection on the rotor and the grid connection on the tube socket that is added. The plate connection of the added socket is connected to the audio transformer where the rotor was connected, or the phones, if no audio was used. A rheostat is placed in the negative side of the A battery.

The dial reading in all probability will now read backward, but if it does just reverse the connections to the rotor. The tuned Radio frequency circuit that you now have is what is known as the reverse feedback system.

For those who desire to build this simple system out and out use the second diagram shown. For extra sharpness of tuning a modified Haynes tuning system is used. Take an ordinary 90-degree variocoupler and on the stator tap the antenna at 15 turns from the opposite end to the tapped one. On a standard variocoupler all stations on all wave lengths will come

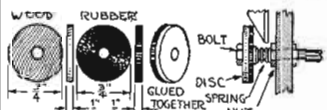
EXTRA TUBE PLACED IN CIRCUIT



in on the second and third tap. The rotor will tune only about 10 degrees from vertical for all wave lengths, and is not much used in tuning. It is used chiefly to bring in and control the volume. The rotor being at all times about at right angles to the stator.—A. J. Anderson, Greenville, Ky.

Vernier Dial Attachment

This attachment is made up of a small rubber and wooden disc glued together and then mounted on a spring shaft which is attached to the panel front at the



proper distance from the dial to make contact with the dial edge. The illustration is self explanatory.—Clement Pack, Menasha, Wisconsin.

Wire for the antenna should be a good conductor of electricity. Some good conductors are copper, phosphor bronze and aluminum.

IF YOUR SET HAS A NONOISE VARIABLE GRID-LEAK



its maker has used the best materials obtainable

Here is a real variable Grid-Leak. The NONOISE is variable through a resistance range of 1/2 to 7 megohms. It can be varied smoothly and silently without loss of the signal. No two sets are exactly alike, therefore the NONOISE that can be adjusted to the performance of your set gives the best results. No matter how good your set may be, a NONOISE will improve it.

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If your dealer cannot supply you we will be pleased to fill your order. Don't send any money, just drop us a postcard and the NONOISE will be sent. Parcel Post, collect. Pay the postman upon delivery.

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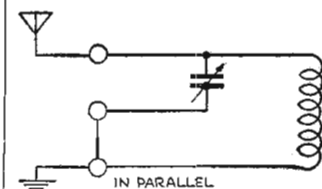
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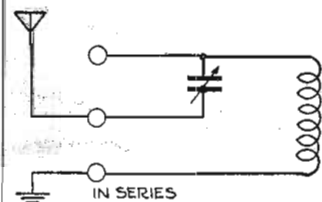
A. O'CONNOR & COMPANY
9712 Euclid Ave. Cleveland, Ohio

Binding Posts Used in Place of Aerial Switch

Instead of using a series parallel switch to change the aerial in series parallel in the primary circuit I use the system as



illustrated. Three binding posts are used for the aerial and ground instead of two and the connections are made as shown. If it is desired to have the condenser in series with the circuit the aerial is connected to the center binding post and the



ground to the bottom, but if it is wanted in parallel the aerial is connected to the top binding post and the ground to the center and bottom binding posts.—Walter Carron, Los Angeles, Calif.

A good pair of telephones is essential for successful operation of a crystal set.

Every precaution should be taken to prolong the life of a good vacuum tube.

STAR DETECTORS SATISFY



Type G, Now \$1.00



Type K, Now \$1.25



B-Metal Loud Talking Crystal

Dear Sirs: Received your detector O. K. It's all you say and then some. On a simple crystal I received the following stations: WCV, WEAB, WFAE, KDKA, WOR and WJL.

Respectfully yours,
A. W. Gale,
Gloversville, N. Y.,
8 Spring Street.

The above letter is typical of hundreds received during the past two years on our Type G Fix Crystal Detector, which has long proved itself and sells at \$1.00. Regularly \$1.25.

THE TYPE K DETECTOR is a very satisfactory crystal for Reflex and Crystal sets.

We make a complete line of crystals which includes every standard material and are in position to quote attractive prices on quantity orders. We can match the best on quality and price. Let us quote you. State quantity.

STAR CRYSTAL CO.
14th Floor, 525 Woodward Ave. DETROIT, MICH.



This Full Size Loud Speaker at Direct factory Price.

\$9.85

Save practically HALF on this 6 1/2 horn. Buy direct and cut out dealer's and jobber's profits. Horn is 19 1/2 inches high; 12 1/4 inch bell; Florentine brown stipple finish; finest diaphragm unit made; metal base, goose-neck and bell. Clear, full-toned, exact reproduction. Money-back guarantee.

5-Tube Receiver \$48.50

Our direct factory price gives you \$25 or more. Range from 2000 miles. Simple to operate. Very effective. Highest grade, laboratory tested parts, we find to Naval standards. Brought hand-rubbed genuine mahogany cabinet. Guaranteed quality. Usually special early price. Versed regularly at retail for \$60.00.

5 Days' Free Trial SPECIAL OFFER

Try the Dexter Receiver and Horn in combination at \$57

For 30 days, Dexter Receiver and Horn in combination at \$57. Send no money. Pay post you decide to return them. man or expressman.

DEXTER METAL MFG. CO.
10 S. 15th Street
Phila., Pa. Radio Engineering Division M

pep up your set with good tubes

TUBES make all the difference in the world. You'll agree with that statement the moment you switch to MAGNATRONS, the moment you notice how clearly and powerfully these tubes bring the concerts to you.

MAGNATRONS are for sale by the better dealers everywhere. The type DC-201 A; the DC-199, and the DC-199 with large base each sell for only \$3.

CONNEWEY ELECTRIC LABORATORIES
309 5th Ave., N. Y. City Factories, Hoboken, N. J.

MAGNATRONS

Questions and Answers

Five Tube Neutrodyne (13219) EFC, Queensland, Australia.

Having received good results from the making of your five tube neutrodyne, unfortunately the wave length is low compared with the wave length of the stations here, which range from 200 to 1,800 meters. I am very anxious to construct one that will include the above wave length and would be thankful if you would supply a layout with instructions.

A.—It would be quite difficult to get a neutrodyne that would cover the range you mention. We would suggest that you experiment with different ways of accomplishing this range. Try using condensers having a very high capacity, to be connected in parallel to the tuning condenser. This method may cover the range as desired. It would be a good plan to use variable neutrodons so that their settings may be marked. By using these variable neutrodons you can experiment with different neutroformers and mark the settings of the neutrodons. If you use coils of the honeycomb type you will need about three sets of coils to cover the range.

Adding Stage of Amplification (13150) JEG, New Orleans, La.

I have at present a three tube set using a detector and two stages of audio frequency amplification, but I would like to add another stage. Can this be done with a low ratio transformer, say 3 to 1? Would there be any distortion of the signals?
A.—With the new type of transformers you may add another stage to your present set. These new transformers are shielded and have features that will prevent distortion, one of which is a large core which increases in high ratio to eliminate distortion.

Three Circuit Receiver (13112) DM, Vancouver, B. C. Canada.

In looking over my back number of Radio Digest for a three circuit hook-up I found one in the September 27 issue and made it as described therein. With this hook-up I can get only up to 475 meters. Why is it that I cannot get a greater wave length? Is there anything I can add to increase the wave length?
A.—If you cannot get the upper waves we would advise you to add about twenty turns to the 40-turn coil, and if you should find that this goes too high so that you cannot get the lower wave lengths, reduce the turns about two at a time until the correct number is reached.

Time counts in applying for patents. Don't risk delay in protecting your ideas. Send sketch or model for instructions or write for FREE book, "How to Obtain a Patent" and "Record of Invention" form. No charge for information on how to proceed. Communications strictly confidential. Prompt, careful, efficient service. Clarence A. O'Brien, Registered Patent Attorney, 2009 Security Bank Bldg. (directly across street from Patent office), Washington, D. C.

ZELLERS RADIO LOG BOOK, 25 Cents. Zellers Company, Hooper, Nebraska.

OCTAGON RADIO LOG lists EVERY 500-watt station in United States and Canada alphabetically by cities on ONE card. Spaces for extra Handies than log book. 15 Cents. F. Kern, Oswego, N. Y.

Log for Your Radio

NEW 64 page log. Holds 400 stations. Shows call, city, wave length, dial settings, frequency, etc. **TUNING SUGGESTIONS.** Section list by wave length—by station, etc. Owners Map. **TROUBLE SHOOTER.** Other valuable information. Worth every penny it costs. A joy to use. Write for the latest leaflet cover. Only 15c.

Send No Money for log service. Postage paid. If you prefer to pay, send \$1.00. **FUNDED IF NOT DELIGHTED.** Oct. 1924—NOW. Postal will be refunded. **RADIO PRINTERS, Dept. 3914 Mendota, Illinois**

\$10.00 IS ENOUGH

You can hear programs from cities 100 to 1,000 miles away on Lambert Crystal Sets and you won't need tubes or batteries.

Picture of set and particulars free. **LEON LAMBERT**
501 Kaufman Bldg., Wichita, Kansas
Dealers write for discounts.

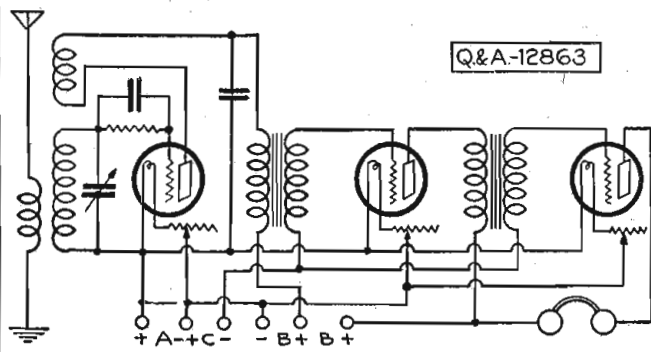
Radio Tubes Exchanged

Send us your old tube—any make—any condition—and we will send you a Brand New Guaranteed Tube—Barely used—1925 type you require, for \$1.75. All shipments by insured Parcel Post. C. O. D. Send no money—order today!
\$1.75 C.O.D.

D-R-C RADIO CO.
327 S. LaSalle St. Chicago, Ill.

5 TUBE SET \$45

NOT A KIT Assembled Complete
WHY BUILD WHEN YOU CAN BUY
The D-R-C Completely Assembled Wonder Set—the 5-Tube Tuning Radio Receiver—Receiver that outperforms sets four times as costly—Direct from the Factory at the amazingly low price of \$45. There's everywhere secure coast to coast loudspeaker connection. Beautiful Cabinet—Barely used and Varnished—Best materials throughout—easily operated. Send money order today for the factory-built, factory-tuned and FULLY GUARANTEED D-R-C 5-TUBE SET at the rock bottom price of \$45.75, o. b. Factory. Write for complete list of Accessories.
RADIO CO. CHICAGO
329 S. La Salle St.



Circuit Wanted (12863) RCH, Rowan, Iowa.

Will you please send me a diagram (plain) by which I may construct a 2 or 3-tube Radio set from the parts as listed below? I want one that a novice may easily follow and that which leaves nothing to the imagination for I know little about making one, but have the following parts and would like to make use of them.

- 1 .0005 variable condenser.
- 1 .00025 variable condenser.
- 1 three circuit tuner, low-loss
- 1 .00025 fixed condenser.
- 1 .001 fixed condenser.
- 2 3 to 1 Radio transformers.
- 1 10 to 1 audio transformer.
- 3 standard sockets.
- 3 6-ohm rheostats.
- 1 30-ohm rheostat.

Hook-up wire, also panel 7 by 12 ins., baseboard and cabinet.
I have not found any hook-up presented in Radio Digest that I can follow with the materials I have on hand.

A.—The accompanying hook-up can be used to take up most of the parts you mention in the list.

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

PATENTS

Time counts in applying for patents. Don't risk delay in protecting your ideas. Send sketch or model for instructions or write for FREE book, "How to Obtain a Patent" and "Record of Invention" form. No charge for information on how to proceed. Communications strictly confidential. Prompt, careful, efficient service. Clarence A. O'Brien, Registered Patent Attorney, 2009 Security Bank Bldg. (directly across street from Patent office), Washington, D. C.

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Radio Inventions a Specialty
Trade Marks Registered
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Patent and Trade Mark Lawyers
Washington, D. C. New York Chicago
ESTABLISHED OVER 60 YEARS

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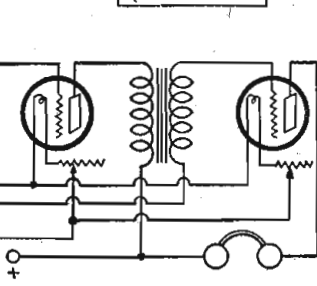
LIGHTNING
Install Now a Low Loss
KEYSTONE
Approved **ARRESTER** 115



Write for free copy of Premier Bulletin No. 31 giving full description of the many new features of this remarkable low loss condenser, as well as particulars of all Premier Quality Radio Parts. "CROFOOT" has lowest minimum capacity; only five minute phase angle loss; tuning ratio of 1 to 74. Made of brass and hard rubber throughout, for low resistance. \$2.75 to \$3.75. Vernier complete with dial, 75 cents extra. Write for bulletin and FREE HOOK UPS.

Premier Electric Co., 3810 Ravenswood Ave., Chicago
PREMIER Quality Radio Parts

Q&A-12863



Reactivating Tubes (13109) RLS, Snyder, Okla.

Is there any way to reactivate the UV-201A tube which burns good? We have about twenty which came in a shipment of about 125 tubes. We did not test them at the time and six weeks later we found this number to be inactive. They are new tubes and there should be some way to have them reactivated. Can you tell us a way to give them life?

A.—If the filament still lights the tube may be improved by burning it at the stated voltage, 5 volts with the UV-201A, for a period of about ten hours. The plate

Thank Your Favorites. Individual applauses cards, 100 for \$1, with your name and address. Press, Jamestown, Indiana.

Buy right and make money. Standard lines, parts, sets, shipped now. Fast service—hard-to-get items—extra good discounts. Get our catalogue No. 8. It shows you!

W. E. FUETTERER RADIO SUPPLY CO.
2121 Locust St. St. Louis, Mo.

A REAL FIXED DETECTOR



As a crystal set in itself. Stands Radio Folging, lasts indefinitely, because of readjustment feature and goes away with hodgepodge catwhisker and hunting for Hot Spot. You can depend on it being always "Hot." Get greater distance reception on CRYSTAL SET. Save A and B battery and Tube life. No better detector than Vacuum Tubes. Get a RADETEC and hear the joy of real reception. Packed in box with brackets and instructions prepared for 21.50. Every one guaranteed.

Dealer Write for Discount
TOWNER RADIO MFG. CO.
2620-A Victor St. Kansas City, Mo.

FREE RADIO STAMPS

616 beautiful genuine copper etched American and Canadian stamps FREE, yes, absolutely FREE, with order for a genuine BRYANT 48 page stamp album (5 x 8 1/2). Also containing log showing stations, locations, wave lengths, dial settings and data. As you hear new stations just stick the proper stamps in your album. Colored individual stamp for each station. So convenient. So enjoyable. You will be proud to show this album to your friends. You and your children will enjoy it. Complete album \$3.98 plus postage.
Send No Money
Just pay postman after album and stamps arrive. I prepay postage if you prefer to pay with order. **MONEY REFUNDED** net DELIGHTED. Send order today—NOW. Postal will be refunded. **P. M. BRYANT, Dept. 9414, 366 Wrigley Bldg, Chicago**

NOV 350
Direct from factory to you.
THE RABAT SENIOR
400 MIL. AMP. CAPACITY

For a Limited Time Only
You can have for \$25.00 a 22 cell 44 volt RABAT SENIOR battery. Saving \$6.00 thru direct buying. 22 cell 48 volt size \$7.00
Rabat Senior batteries are best, powerful, noiseless. Separate clear dust caps and patented rubber cork with heavy duty (1/16 x 1/2 x 1/2) with staggered ribbed and form the bulk of this sturdy battery. Shipped completely charged, ready to use. Order now, save \$6.00
Rabat Super Charger \$3.00 c. d.
Specially designed to recharge any "B" battery. Shipped complete ready to use, including lamp socket, instruction plug and cord. You save \$1.00 by ordering direct.
Send No Money but prepay order. After receiving and approving these batteries pay by express the small c. d. charge. RABAT'S are guaranteed one year.
THE RADIO RABAT COMPANY
1767 ST. CLAIR AVENUE CLEVELAND, OHIO

voltage should be turned off. There should be no other connections. You may have other troubles with these tubes which cannot be fixed by these simple methods.

Improving Two Tube Reflex (13232) EGM, Georgetown, Conn.

I have a Harkness two tube reflex in which I use WD-12 tubes with 45-volt B battery. With this set I get good results as far as distance is concerned, but the advertised loud speaker volume is conspicuous by its absence. I wish to know if 6-volt tubes will increase the volume? What is the proper B battery voltage? I have tried 90 volts and this cuts down the volume. Can a resistance-coupled amplifier be hooked up to this set, and, if so, will you please send me a hook-up for it?
A.—You should not expect to get much volume from this set with WD-12 tubes and 45 volts on the plate. If you use UV-201A tubes you will have no trouble with the lack of volume. It is advisable to use resistance-coupled amplifiers with the WD-12 tubes.

Salemen calling on radio dealers wanted to handle Radio Tubes as a side line. The Thoria Tube Company, Dept. "D," Middletown, Ohio.

GO into the RADIO BUSINESS
We specialize in Equipping New Dealers with entire stock—ADVISE FREE. Send for Our BARGAIN LISTS. Wholesale Only
MANHATTAN RADIO CO.
112 Trinity Place New York City

Throw Away your Log Books and use **THE ACCURATE DIALING CHART** It gets your Stations regardless of the Wave Lengths changing.
Price **50c** Postpaid
ACCURATE DIALING CHART CO.
Kingsburg, So. Dak.

ONE DOLLAR brings you this Radio Cabinet with Solid Walnut top, in Walnut or Mah. Finish. Look it over and it meets your approval. Pay expression balance.
HARPER MFG. CO.
Cassopolis, Mich.

DUNLAP'S RADIO CALL BOOK

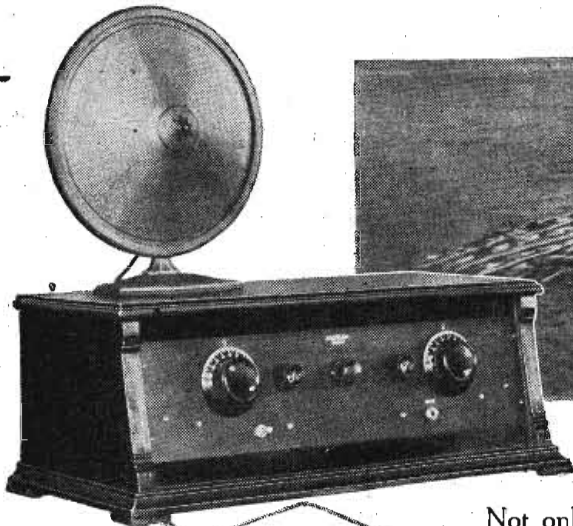
Listing all Broadcasting Stations
Always Up-to-Date

Changes Mailed to you Each Month for a Year
Up-to-date international call book compiled by Orrin E. Dunlap, Jr., Radio Editor, The New York Times, includes 4 columns for dial readings, owners, wave lengths, power and slogans.
Immediate delivery
Send \$1 for book including monthly service for a year that keeps your station list always accurate. Correction pages have gummed edges easily attached in back of the book. Send cash, check, stamps or money order.
DUNLAP'S RADIO CALL BOOK SERVICE
Box 88, Flushing, N. Y.

Profit by Your Meteorological Observations

The editor of TYCOS—Rochester, a meteorological journal published by Taylor Instrument Company, Rochester, N. Y., seeks to review manuscripts based on observations of atmospheric phenomena, its effect on radio reception, with a view to publication in above magazine. Prevailing space rates paid promptly on acceptance. All material reviewed promptly. Addressed to the personal attention of F. M. Herrick, Editor Tycos-Rochester, Taylor Instrument Companies, Rochester, N. Y.

What the Trirdyn gets where it's hotter than Summer!



Crosley Trirdyn—on the Sahara Desert at mid-day—brings in Radio-Paris on the loud-speaker!

Not only at mid-day, but in February—in Northern Africa and far hotter than any American summer.

The picture above, a post card snapshot sent from Tunis to Mr. Crosley, by D. F. Keith of Toronto, Ont., tells this story on the other side:—

\$65⁰⁰
 Accessories Extra

Crosley Trirdyn Special

Three tubes better the results of five or six
 A highly efficient, non-radiating combination of tuned radio frequency, Armstrong regeneration and reflexed amplification.
 New cabinet, sloping panel
 Battery self-contained
 Exclusive Crosley 3-tube circuit

Tunis, North Africa, March 3, 1925

Dear Mr. Crosley:

Fishing here is rotten but radio is fine. On the Sahara, using three tubes on the Trirdyn circuit, reception from Paris came through on the loud-speaker. Along the south coast of the Mediterranean, using this set, six or eight high power European stations came in with good volume by day-light and all of them after dark. Can usually get a few American after 1 a. m. Can you fish with us this year?

Cordially,
(Signed) D. F. Keith

Further details on the margins of the picture:—

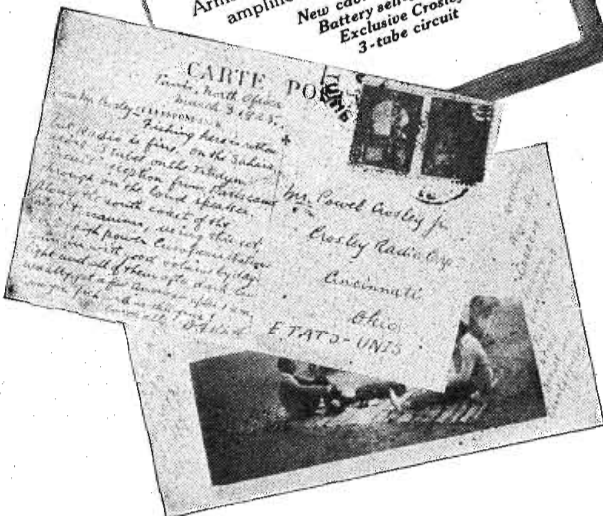
Sahara Desert, 250 miles south of Algiers, February, 1925. Receiving noon-day concert from "Radio-Paris", Paris, using aerial and counterpoise.

Who said summer in America is a poor time for radio—if the receiver is a Crosley Trirdyn?

Every radio fan—actual and aspiring—is invited to think this over and then act.

On the Trirdyn is the beautiful new Crosley Musicone, radio's most startling development. The Musicone's abilities and its beauty are so superior that we expect it to replace half a million loud-speakers this year. \$17.50.

The Crosley Radio Corporation, 4493 Sassafras St., Cincinnati
Powel Crosley, Jr., President



CROSLEY RADIO

Better—Costs Less