

Radio

EVERY WEEK

PROG
INVEST

CHASE THEMSELVES AROUND THE WORLD

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Beginning at 7 o'clock in the evening, the best talent available will pass before the microphones in the studio of the station at the Wood-Cadillac hotel. A varied assortment of character and appeal will be provided.

One of the features to be presented to the Radio audience will be the Detroit Symphony orchestra, normally considered as one of the finest assemblages in the country.

IN RADIO DEBUT



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LECTURES ON EVOLUTION

ASKS LEGAL ACTION TO SILENCE STATION

NEW YORKER HOLDS WNYC POLITICAL MOUTHPIECE

Says Mayor Uses Municipal Station to Broadcast Propaganda at City's Expense

By Zack Foreest

NEW YORK—Action has been started by the Citizens' union of this city to close the municipal broadcasting station, WNYC, on the grounds that it is being used by Mayor Hylan for disseminating political propaganda.

Application for the closing order was made by Leonard M. Wallstein, counsel for the Citizens' union, based on affidavits of Henry Fletcher, vice-chairman of the organization. The court's order requires the mayor and Commissioner Mills, the joint defendants, to show cause why an injunction should not be issued against the further operation of the station.

Three grounds, justifying a court order for closing the station were cited by Mr. Wallstein.

"That the city is without legal authority to spend money for the purchase, construction or operation of a broadcasting station.

"That the law makes no provision for the broadcasting of propaganda on behalf of the defendants or any other person or persons.

"That such acts constitute a waste of city funds and other property of the city of New York and cause an irreparable injury to the city."

When the station was opened a little more than a year ago at an estimated cost to the taxpayers of \$50,000, the first commissioner of plants and structures, Grever Whelan, speaking for the mayor, issued a statement in which he said:

(Continued on page 2)



HARVARD MAN TO BROADCAST BASIC THEORY

Man Comes From Ape

Professor Holds Man Can Believe Darwin and Still Be a Christian

BOSTON—Dr. E. A. Hooton, professor of anthropology at Harvard university, will endeavor to explain the theory of evolution to Radio listeners in an hour's lecture which will be broadcast from Westinghouse Station WBZ Friday evening, August 7.

Dr. Hooton will go on the air at 3 o'clock, Eastern time, and although it will be impossible to cover at length this vitally interesting and absorbing subject in such a short time, he will explain to the vast audience the basic facts of the evolution theory.

"One of the greatest events in the history of the world took place when the ancestors of man descended from the trees and started to walk on their hind legs," declares this noted scientist who demonstrates how changing methods of moving about, of fighting and of living

(Continued on page 2)



Some people say that Chicago justice do fancy things when they try gammas but after looking at the little lady pictured above you will have to admit that the lady of Windy City men who pronounced Mary Bragdon guilty of being pretty enough to assume the titles of "Miss Chicago" and "Miss Illinois" is a recent convert, was correct in their opinion. Miss Bragdon is heard frequently from WJZ. Madame Olga Petrova (left) now appearing in "Murrkane," recently talked about the stage from WJZ. Madeline Huister (right) is off those heard from WJZ.



NEWS BRIEFS FROM THE BROADCASTERS

INVITE MONKEY TRIAL MEN TO SPEAK FROM SHOW

Cuba Joins Argentine to Entertain; Army Band Heard on Four Station Hook-up

Officials of the Radio World's Fair have invited Bryan and Harrow to use their special broadcasting hook-up to address 25,000,000 people on the evolution question during the show in New York.

Maria Montez, pre-eminent dancer; Juan Pardo, Spanish reeling harbinger of the National theater; Havana, Cuba, and Carlos Gardel's Argentine orchestra combined to delight WOR afternoon listeners recently.

New York, Washington, Philadelphia and Providence heard the music of the United States army band on July 28, when it was broadcast from WJAF, WJAF, WOD and WJAF from 1:30 to 2 p. m. Eastern daylight time. Capt. William J. Starnord conducted the concert, playing in the army barracks, Washington.

A series of golf talks from Station WJAF, of the United States Flaming Club company, Cincinnati, are being given Wednesday evenings by George Bowden, professional at the Mokenwah Country club, Cincinnati. Mr. Bowden is one of the leading professionals in the United States.

On August 3 Station 2LO, London, will transmit the first real broadcasting play ever produced in Britain. It is a mystery play in modern style by a new author, with the underlying motive of the Christ rising through it.

A novel feature of the ten weeks series of band concerts given by the Golden Band on the campus of New York university will be the tournament for boys' funds to be broadcast through WJAF and others on Friday, August 14, beginning at 9 p. m.

During the absence of Mrs. Ellen Rose Ditcher, home adviser of the Sears-Robinson Agricultural foundation on her vacation, her work over WJAF will be carried on by Mrs. J. C. Scully, of Brookings, S. D. Mrs. Scully, who is a graduate of the South Dakota Agricultural college, has been instructor in home economics for five years at the high school at Clark, S. D.

Hawaiian music shows especially popular in summer with the Radio audience, so Station KDKA gave another of its series by the KDKA Hawaiian players on August 1.

Open-air band concerts and special late dance programs during the next two months are the newest hot-weather features to be slated for long distance Radio listeners by KOA, Rocky Mountain broadcasting station of the General Electric company at Denver.

Of special interest in the Northwest was KPOA's recent program which had for its principal attraction the principals in this year's production of "The Wayfarer," being held at University of Washington stadium in Seattle.

Klinton Teschick, an Indian singer who has been a WJAF staff artist, broadcast recently from KJF, Seattle. Simon Oliver, an Eskimo pianist from Unalaska, and Teschick's partner, accompanied the choir.

"Radio Broadcast," by Kenneth C. Beaton, known to millions of newspaper readers as K C B, is now being as a regular KGO Tuesday evening feature. K C B will speak at 8 o'clock.

Two new ideas are to be broadcast from KTCU, Seattle. One is a "friendly aid" service which is to be directed by George H. Crandall, a well-known lawyer. The service will offer friendly advice and counsel on legal troubles that everyone runs into. The other feature is known as the "Voice of Seattle" and will be broadcast from a downtown street intersection. Harold Grams, program director of KTCU, will give a description of the aspects of Seattle and several novelties are to be introduced.

Universal Company Takes Over WCAU, Philadelphia

PHILADELPHIA.—Station WCAU located at the Hotel Pennsylvania, formerly operated by Durham and company, has been taken over by the Universal Broadcasting company. Stanley A. Brown, a member of the firm well known in broadcasting circles, has been appointed director of studio and programs, and has arranged more elaborate new features and surprises for the Radio audience for the coming season.

ABDEL KRIM WANTS RADIO—NO CAN DO!

PARIS.—A neutral journalist who has recently returned from a visit to Addear, the capital of the RIF, noticing that the Riffian method of communication between general headquarters and local commands was the field telephone, asked him why he did not use Radio also. The RIF Sultan replied: "In the first place I have no apparatus. I dare say I could get that easily enough, but I have no one at present who understands the working of Radio."

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GRACE DRAYTON IN RADIO DEBUT



It is well and fitting that the first talk over the Radio to the kiddies given by Grace Drayton (from WJAF) should be entitled "Loving Children." She has won international fame as an artist with her "Kiddie" drawings, verse, and prose.

Why Worry About Time Used When We Work It Out For You Weekly?

DENVER, Colo.—Broadcasting experiences at Denver further reveal that static is not the only problem of Radio fans. To compute the correct time elsewhere and to know when and how to calculate differences between Eastern, Central, Mountain and Pacific coast time, to say nothing of daylight saving, when "Dixie" is a unique problem in itself. The puzzle is made all the more complex by the growing number of broadcast stations. Government records it is said, now indicate in excess of 160 class B stations in this country alone. "How many country differences between here and Hawaii, Chicago and Dallas, Elka, Alaska, and Richmond, Va?" are typical of the many questions raised by inquirers among KOA's audience. Astronomers, science professors, railroad officials and weather forecasters as well as broadcasting officials, declare as overruling avalanche of time-questions

has been raised since the overwhelming popularity of Radio as a summer diversion. "I am a professed Radio enthusiast," reads a recent communication to the General Electric station at Denver from a student of a leading western university. "My greatest bugaboo, however, is knowing when to listen for a 10 o'clock program in Wisconsin or a 6 p. m. program in Mexico. "I am fully aware that 6 p. m. in London and Paris is around 10 o'clock here, Standard time in New York, 10 a. m. in Denver and 5 a. m. in Oakland, Calif. but how am I to know which of the other cities are embraced by the Eastern time group and which in the Central, Mountain and Pacific coast groups?" (The time standards to see by each station is listed in the "Radiophone Broadcasting Stations" list, published weekly by Radio Digest on the last page—Editor's Note.)

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Music From Belle Isle

At the time the orchestra is broadcast it will be playing in a new \$50,000 shell which will be built this summer on the city's beautiful Belle Isle park, in the Detroit river. This program will be followed by a varied studio entertainment presenting vocal and instrumental artists. During this studio program a number of features soon will be presented in short talks incidental to the inauguration of the station.

Popular entertainment will have its place on the program, since it is the station's intention to please every member of the Radio audience, and in following out this intention it is necessary to present all of the various entertainment outlets to broadcasting.

WJR in the station, 7 p. m., Eastern time, is the hour; 617 meters in the wave length, and 5,000 watts the power; the date—August 15.

'BIG BROTHER' ON VAUDEVILLE BILL

Bob Emery Shows Boston Keith's Audience How He Entertains Kiddies

BOSTON.—For the first time so far as is known, a Radio announcer has had a week's engagement at E. F. Keith's theater in Boston. On July 21, Bob Emery, Big Brother in the 18th number of the Boston Edison Big Brother club forenoon the microphone at WJAF's studio for one week to meet the children face to face on the stage and show his audience how he entertains the kiddies nightly at WJAF.

The routine of Big Brother's act consisted of a brief show of motion pictures showing views of the recent Big Brother club outing, ukulele songs, stentoriums, and a brief Radio sketch in which Bob Emery was the principal.

The Radio sketch was entitled "The Program Director." It was in two parts and depicted the troubles of a program director in his office and then some of the trying situations in the studio before the microphone. This sketch was written by Charles Burton, associate-director of broadcasting at WJAF, showing the Radio audience exactly how broadcasting is done. The audience not only saw Emery in action on the stage, but heard from amplifying horns exactly how his voice comes to them over the air.

New Stations

WGBU is the new Florida station which has been pending files for the last few weeks. This new 500-watt Western Electric (R) station, operating on 184.4 meters, is located at Palmdale, Fla., 100 miles north of Miami Beach. The chief announcer is Robert H. Nolan.

WCAU, Philadelphia, formerly operated by Durham and company, is now owned and operated by the Universal Broadcasting company.

The following limited commercial class "A" stations were licensed this week: KQW, Hood River, Ore., 148 watts, 176 meters; KJCC, Helena, Mont., 10 watts, 248 meters; KJFWO, Avalon, Calif., 500 watts, 211.5 meters.

San Francisco is to have its first super-station when KPD, Hale Brothers, goes on the air, 8000 with its new 4,000-watt transmitter.

'BWS' LEAVING WOC FOR EASTERN 'MIKE'

PALMER SCHOOL TO LOSE POPULAR ANNOUNCER

Stanley W. Barnett Goes to Baltimore Soon to Help Start High Power Plant

DAVENPORT, Iowa.—According to an announcement made public here by the Palmer School of Chiropractic, Stanley W. Barnett, studio director at Radio WOC, and known to the Radio audience as "Announcer BWS," has resigned his position with the Chiropractic Fountain Head Radiophone station, the resignation to become effective some time in August. According to his present plans, he will embark with a few high-power stations which he under construction in Baltimore, Md., and which will go on the air about October 1. The Gas and Electric company of Baltimore will operate the new station. It will have a capacity of 5,000 watts.

Frederick R. Huber, manager of the station, in outlining the policy said: "Everything that he of the best in Baltimore will be broadcast. Baltimore's best restaurants and vocal talent, her best attractions, her best artists. It may be that the Baltimore Symphony orchestra, the Park band and the Municipal band may give concerts. Or, some of our leading orators, or members of the Parkside conservatory faculty. New discoveries at the Johns Hopkins university can be given to the world through us. The possibilities of our new station are unlimited."

Will WOC Over 2 Years

Mr. Barnett has been associated with Station WOC since its inception three and a half years ago, and has seen one of the best and most successful stations grow up from a small, insignificant beginning, and in this development "BWS" has played a very prominent part. WOC, about eight months ago, installed the latest type 5,000-watt transmitter.

When interviewed at WOC recently concerning his change, Mr. Barnett stated that for some time he had felt a desire to make a change, preferably, to be nearer his former home in Pennsylvania.

"You know," he said, "my folks never go to bed at night without hearing me sign off at WOC. So I rarely get to see them or nurse of the distance and the time that I would be absent from the station at WOC."

"What are your other reasons?" he was asked.

"Well," he replied with pleasing modesty, "I have been told that I have played a responsible part in making WOC's organization, reputation and enablement of service what it is, and when I was approached by another Radio station to do the same thing for them, and in view of the other factors, I decided to make the change, much as I dislike the idea of leaving WOC, Davenport, and all the friends I have among the station staff, and the artists who frequently come here. As for the Radio audience, I don't think they will miss me so very much because I will be on the air again within a few weeks, and they and I will at that time be able to renew our acquaintance. I really believe, though, that I, personally, will feel the change much more than the listeners in will feel it," he concluded.

Sorry to Lose 'BWS'

When Dr. B. J. Palmer, president of the Palmer School of Chiropractic, was interviewed concerning Mr. Barnett's resignation, he stated that while sorry to lose the services of "BWS" he was at the same time glad that Mr. Barnett was being called upon to help in building up a similar organization in another part of the country. In regard to the future personnel at WOC, Dr. Palmer stated that they were at present selecting from a number of applicants a man who would satisfactorily fill the position of announcer and who, at the same time, would be an highly acceptable and pleasing to the Radio audience as was Mr. Barnett.

"We also intend to put on several new features in our broadcasting program which we feel sure the Radio audience will find more than ever attractive, pleasing and profitable. It will be some days, however," concluded Dr. Palmer, "before we shall be in a position to make public our choice of a successor."

Before coming to the Palmer School of Chiropractic—his own school, incidentally, he is a graduate besides being their chief announcer at WOC, and one of the greatest announcers in the country—Mr. Barnett was a first-class electrician (Radio) in Uncle Sam's army, and saw service during the World war.

Landlord Cannot Refuse Radio

VIENNA.—The right of a tenant to set up a receiving outfit despite the opposition of his landlord was the subject of a recent law action in the Austrian courts and resulted in the complete victory of the tenant.

BIDS WEST GOODBYE; GOES TO BALTIMORE



Stanley W. Barnett, former "Announcer BWS" at WOC, Palmer School of Chiropractic at Davenport, Iowa, has resigned from his post there to take a position with the new 5,000-watt station of the Gas and Electric company at Baltimore, Md. The new station will take the air October 1, it is planned.

WIP to Have Home on \$18,000,000 Building

Gimbel Brothers Soon to Start New Store

PHILADELPHIA.—Gimbel Brothers of this city, operators and owners of Station WIP, are having plans prepared for the erection of a 6,000-watt station on the top floor of their new twelve-story department store building, construction of which starts soon. The building will cost \$18,000,000.

Richard Gimbel, a member of the firm, and who has taken an active interest in the operation of the station, has made a tour of all the principal stations of this country and abroad in an effort to learn just what will make WIP one of the most attractive, as well as most powerful, broadcasters in the United States. Edward A. Durkin, director of WIP, states that the new station will be put in operation as soon as the new building is completed.

JACK DEMPSEY HELPS OPEN NEW WOK STUDIO

Terrace Garden Is Site of New Hotel Plant

CHICAGO.—WOK, at Roosevelt, a suburb near here, opened its new Chicago studio in the Terrace Garden, Marston hotel, recently and celebrated its increase in power with a dinner-dance for friends and Radio artists.

One special feature was a talk by Jack Dempsey.

The station is owned by the Northwestern Radio company and has 5,000-watt equipment. Only 1,000 watts will be used for the time being. Batteries supply the transmitting power.

George W. Allen, a new voice to Radio, is announcer and director Harry Waters, formerly at WHL, is assistant director and announcer Robert North, pianist who has been heard from many stations, is also on the station staff.

Silver Cup Is Award for Most MacMillan Messages

NEW YORK.—A silver cup has been offered as a trophy to the amateur Radio operator who picks up the largest number of messages from the MacMillan expedition from now until September 15, by the Second Radio World's Fair, through U. J. Harrison, managing director. In letters addressed to the National Geographic Society and the Amateur Radio Relay League.

EVEREADY HOUR EVERY TUESDAY AT 8 P.M.
Guests Standard Time
For all radio enjoyment, tune in the "Eveready Hour" broadcast through

WEAF	New York
WLAS	Providence
WJLH	Boston
WFI	Philadelphia
WEEI	Buffalo
WCAE	Pittsburgh
WBAE	Dayton
WGLI	Columbus
WWJ	Detroit
WCCO	St. Louis
WOC	Baltimore

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It is no accident that more Eveready Radio Batteries are purchased by the radio public than any other radio battery made.

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You can prove this for yourself by hooking Eveready Radio Batteries to your set. You will find that they deliver a steady, vigorous stream of power that lasts longer. It is Eveready economy that has created such an overwhelming preference for Evereadys. For every radio use there is a correct, long-lasting Eveready Radio Battery. There is an Eveready dealer nearby.

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Cleveland Montreal Chicago, Limited Toronto, Ontario

EVEREADY
Radio Batteries
—they last longer



Eveready Columbia Radio Battery. The perfect power for all radio dry cell sets.



No. 222 45-cell Large Portable Price \$2.75



No. 207 45-cell Large Broadcast Price \$3.75

WEAF, "Chief of the Link Stations"

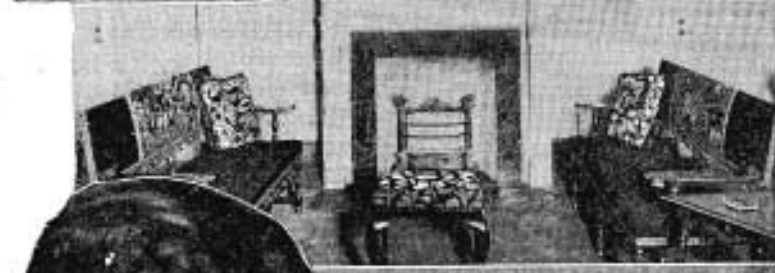


The input control board where voices from the microphones are amplified and relayed by lines to the WEAF string.



Two views of reception room. Door in the upper photo leads to studio pictured at page bottom.

"Smiling" Betty Lutz, the charming day business at WEAF.



Here is one of the most popular quartets ever heard in America, the four great announcers of WEAF. At the top is Graham McNamee, whose voice has been heard over as many as fourteen stations at once and who has headed the Gold Cup Announcers' contest list for weeks. Next we have Phillips Carlin, also heard over the WEAF link. He always smiles they say! The gentleman with the dreamy eyes always radiates joy over the "link," perhaps because his name is Leslie Joy. At the bottom is James Hwepp, who has made good use of his excellent musical education to make the programs he announces more interesting.



Left, Winifred Hazz (upper) and Kathleen Stewart (lower) are examples of modern, all-comparable at WEAF.

EMBODYING the latest developments in studio acoustics, in studio arrangement and many technical improvements in broadcasting equipment, WEAF's studio and remote control facilities in New York city, are the last word in this important phase of broadcasting.

Years of broadcasting by WEAF have indicated desirable features in studio design which improve the quality of Radio programs. Meticulous attention to detail is responsible for much of the improvement in acoustic properties. The parietal floors are laid in place and are insulated from the walls of the studio. False walls are used between the studio and the hall to introduce a dead air space, making them practically impenetrable to sounds in the hall.

The draperies on the walls are arranged that they can be adjusted to give the correct degree of deadening for the particular music being transmitted. For instance, heavy brass bands require more deadening than a quartet or a duet. A speaking voice requires the least deadening for good transmission, in every case the studio director can make his corrections and adjustments without loss of time.

The permanent feature of the studio installation is the use of two studios, a small one for singers, speakers and small groups of instruments and a second large studio for bands, large choruses and orchestras. Between the two

studios is the most perfect booth from which the programs are directed.

WEAF has four announcers on the link. They are well known to the audience throughout the country, due to the linking of stations with WEAF for their varied programs. When you hear, "Good evening, ladies and gentlemen of the Radio audience," you can be sure that it is the voice of Graham McNamee, ready to deliver his announcement of the forthcoming attractions. He has covered most of the national events that have been broadcast through WEAF, and is noted for his well modulated voice. To him, falls the honor of announcing the Hourly and Victor presentations.

To those who are familiar with the introduction and announcements of "The Man in the Silver Mask," the "Silvertown Card Game," or the "Happiness Caddy Boys," the voice of Phillips Carlin is a source of real enjoyment. Among many of his friends he is known as the "Grator of WEAF." His smile is contagious.

When a delay comes in any of the programs, Leslie Joy, announcer steps in and fills the gap with a feature solo. He has had a wide and varied career, though still under thirty years of age.

(See page 4)



No wonder WEAF's voice is always cheery. Look at the announcers.



At the photo, G. H. Hanson, chief engineer, is seen behind the scenes.



Left, S. E. Ross, director of programs that are programs. Right, a glimpse at the principal studios.



MATRIMONY NOTES SWAMP KOA PLANT

SPINSTERS-BACHELORS, ASK AIRLINE TO ALTAR

Station Refuses Cupid Role; Requests
Continue to Come from
Coast to Coast

DENVER, Col.—Radio may be faced with the unenviable responsibility of solving matrimonial problems for sobersiding spinsters and bachelors of the country, if the ailing rush on KOA here is any criterion.

Regardless of growing demands from correspondents in the unmarried class, officials of the Rocky Mountain Broadcasting station, have adopted the strict matrimonial policy of "hands off." In fulfilling the responsibility of finding radios, likewise, they are holding out hopes that the situation will become less acute with the expiration of summer.

Ohio Leads All

Ohio ranks first in the number of correspondents appealing to the station for guidance in the matrimonial field, with Iowa taking second place and Washington third.

An Illinois girl gives her age as 18 and advises she could settle down with "any nice man, if such a creature exists." She adds further, "I never have been able to run across one yet." A Cincinnati maiden declares she is "very good looking and quite popular among the younger set." A high school girl in Iowa suggests, "I suppose I am counted an old-fashioned because my hair is not bobbed."

Women Search There

From an Oregon lumber camp a bachelor writes, "Wouldn't you very much like to see me looking for someone to write to. Please forward some names." An ex-soldier asks KOA to supply him with names of pretty Denver girls and a Colorado teacher wants to hear from a girl who cares about living in the country.

A Hartford, Conn. lady correspondent wrote a lengthy letter to the broadcasting station after finishing a book of romances which "was such a beautiful ending," and A. Frankfurt, Ky., correspondent advises that she is "just past 18, sweet and loves music and good books."

Expects Half Billion to Be Spent on Radio

Radio Fair Head Bases Estimate on Government Reports

NEW YORK.—Half a billion dollars is likely to be spent by the American public for radio apparatus within the next year, in the opinion of H. J. Hoffmann, managing director of the Second Radio World's Fair, who bases his conclusions on government reports and the estimates of leading manufacturers.

One of the greatest gains in Radio sales this year will be among the farmers," Mr. Hoffmann declares. "A considerable proportion of our agriculturists, for one reason or another, was slow in developing the Radio form; but now Radio has become an indispensable factor of farm life, and has even been the subject of entertainment and musical education in the view of the inevitable information on market conditions and on agricultural improvements and advice.

"Everything points to a prosperous year for the farmers. Large sums will be expended in the chief agricultural states for Radio installations."

Mr. Hoffmann states that representatives of several leading tractor organizations would be in New York the week of September 14-19 to view the exhibits of new Radio products at the Second Radio World's Fair in the 25th Field Artillery Armory, the largest hall in the world.

"Lopez Speaking" Is Again Heard from Manhattan Island

NEW YORK.—Vincent Lopez has returned to the good old U. S. A. and is back on the air again playing through WEAF every Tuesday, Thursday and Saturday from the roof of the Hotel Pennsylvania.

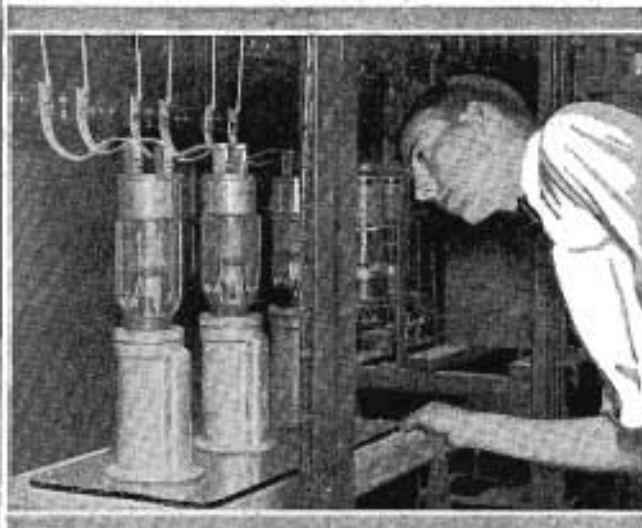
One of the pioneers of broadcasting, whose "Lopez speaking" is famous throughout the country, he returned to New York on the S. S. Vesta following an unusually successful engagement at the immense London "Hippodrome" and at the Casino de Monte Carlo.

Although the sole attraction in a theater contains the horns of an operator operator, the Lopez orchestra proved a sufficient driving card to fill most of the 2,400 seats daily.

New Mike at KGB

TACOMA, Wash.—Local Station KGB, in having its station recently overhauled, has added the latest type of improved microphones with sensitizing amplifiers. The wave length remains 249.7 meters.

WPL USES WATER COOLED TUBES



Some of the giant water-cooled tubes in the transmitter of Station WPL, the broadcast station owned by the Paulist Fathers, New York city, soon to open at the First Radio church directly connected with the Roman Catholic church

WEAF, CHIEF OF LINK (Continued from page 3)

Those who listened to WEAF's "Voice of the Nation" program which was broadcast by WEAF and seven other stations are probably not aware that the entire production was conceived by James Haupt, one of WEAF's popular announcers and familiarly known to the entire staff as "Jim plain 'Joanna'." His forte is in his fundamental knowledge of music which has been utilized in the planning of such programs as the "Prelude Hour" and the "WEAF Light Opera Quartet."

Upon entering the reception room at WEAF, a visitor is greeted at the door by Miss Betty Lutz. She is the day bookkeeper and is noted for her charming manner and big smile that is given to everyone. During the evening, Kathleen Stewart and Winifred T. Hart act as hostesses-entertainers. Their names are perhaps recognized more than the call letters of the popular New York station itself.

A large and comfortable reception room with doors leading directly into each studio provide a waiting room for a large number of artists. A special loud speaker equipment furnishes them with entertainment while they are waiting for their turn to perform.

The plant department, or transmitting room is adjacent to the studio. Here all studio and remote control circuits terminate in a power input panel and are connected with the special use to the transmitter located at West street. A system of sensitive detection net works is located in the plant department so that the attraction of lines controlling broadcasting from remote control points can be suitably equalized for Radio broadcasting purposes. All remote control will then be handled at one point by a specially trained crew.

A special ventilation system has been installed in both studios, which changes the air within them every seven minutes. This assures cool, clean air even in mid-summer. In order to eliminate street noise during broadcasting the windows in the street may be kept closed without interfering with the comfort of the artists.

All of these facilities result in a marked improvement in the conduct of the program and practically eliminate loop walls between studios in the program, and those walls occasioned by switching from one studio to another or to remote control points, when broadcasting is done from the outside.

WEAF has broadcast some of the largest and most notable events in the history of the country. The Democratic convention and the inaugural address of President Coolidge being two of the most important.

During the broadcasting of the Defense Day test, broadcasting was accomplished over the longest link of stations that ever was attempted. The success of this test showed the remarkable possibilities of broadcasting when the water is in the throes of a catastrophe. "The Daddy of 'em all"—WEAF—

The French company has just decided to adopt the word "haut-parleur" (loud speaker) into the dictionary, then translating its name.

ERECT NEW STATION AS A 'TRAFFIC COP'

WILL OBSERVE 'JAMMING' OF EUROPEAN STATIONS

Believe New Detector Plant Will Aid
in Clearing up Difficulties
of Broadcasters

LONDON.—An interception station—a sort of central listening post—is the latest development of the British Broadcasting company for improving and developing the broadcast services both of Great Britain and the continent.

It is being constructed near Bromley, Kent, and will be working in six weeks. It is the first station of its kind to be erected.

By the use of a super-sensitive and powerful receiver working on four high frequency tubes, one detector and two low frequency tubes, the station will be able to pick up signals from all continental and many American transmitting stations. It will be able to tell if one station is jamming the transmissions from another. By the use of a direction-finding apparatus the operator will be able to tell in a few minutes what stations are at fault.

"Charleston" Taught by Radio in Chicago

Dancing Master Instructs Fans in Fundamentals

CHICAGO.—"The Charleston" is all the rage this month! Not the sleepy old town down Carolina way, but the dance that is said to have originated on the banks of the Ashley and Cooper rivers that now goes that sweet Palmetto city. In order that Radio listeners might be up to date on this latest dance craze, WMBB, in cooperation with a local morning newspaper, will broadcast lessons telling how the fundamental steps might be mastered. The lessons will be given by the dancing master of the ballroom where the station is located.

Diagrams published in the paper each morning are explained via Radio at 8:30, Central Standard time. By studying the cuts and then listening in on the Radio, all who really care to try learn the dance

Pittsburghers Seek Time to Search Ether for DX

PITTSBURGH.—This city will have a Radio night if the plans of the local Retail Credit Men's association are carried through to a successful conclusion. This organization has recently formed a committee with a view to bringing about a silent night at least once or twice a month here. It has arranged conferences with other trade bodies and with local broadcasters in order that they can find periods when they may tune their sets for out of town stations and thus check up on the capabilities of these instruments.

Make Sure of Receiving Your Copy Each Week

and receive the best service from Radio Digest. Requests for missing copies are numerous. You cannot afford to miss a single issue. Your best protection is a mail subscription. Now is the time to get on the weekly mailing list.

One of the popular Radio Broadcasting Stations writes:—*** "We find the trouble in this locality is the fact that our listeners are having difficulty in securing copies of Radio Digest."***

Many readers miss some of the issues of Radio Digest. It is a disappointment to reach a newsstand sold out. Readers become dissatisfied and Radio Digest loses a reader. Our best efforts are being put forth to have copies always on newsstands. Frankly, we admit that the job is very strenuous.

YOU CAN HELP

Advise us promptly of any difficulty you have in getting your copy. Give us the name and address of the dealer who is sold out. Your mail subscription will solve your problem. You will find a coupon in each issue. Today fill out the coupon and mail at once. This insures your copy each week, delivered on time.

Radio Digest Publishing Co.
538 N. Dearborn Street
Chicago, Ill.

RADIO MAY HELP IN PASSING NEW LAWS

NEW YORK GOVERNOR USES WGY FOR REFERENDUM

Broadcasting Discussions On Important Legislation Will Obtain Views of Voters for Representatives

SCHENCKSTADT, N. Y.—The Radio referendum law, in a few years, is expected to be by legislative enactment. The result of such a referendum is expected to be decided by representatives, the Radio station, for the sentiment of the voters may be so acted to have an important part in interpreting the wishes of the electorate and in influencing the action of the law maker.

Governor Alfred E. Smith of New York has several times appealed to the voters of his state in reference to them and he is convinced that Radio broadcasting has entered on a new and almost limitless field of public service.

Governor Smith says: "The American democracy covers so vast a territory that we must inevitably withdraw an art that brings its executives and legislators into the most immediate contact with the public they have been elected to serve. The advantage is double. It expedites the sending of an intimate message to the whole body of citizens and it assures to the speaker a more prompt and frank expression of general opinion than he could obtain in any other way. Thus there is preserved a mutual relationship that is of especially high value as new problems arise which can best be solved by a renewed meeting of minds.

Officials Close to People

"Recent experience in broadcasting matters of public interest through the medium of WGY has given me a new sense of close fellowship with my fellow citizens; their many replies have been a help and an inspiration in seeking a solution to the questions which an executive can conscientiously answer only in the full light of the common thought."

WGY, one of the most powerful stations of the General Electric company is located at Schenckstadt, within sixteen miles of the Capitol at Albany, which is connected to the Radio station by wire lines. From time to time the governor, legislators and department heads have used WGY for the privilege of using its facilities to reach the citizenry. Whenever this could be done consistently and with fairness to those already selected on the program, the Schenckstadt station has given of its time. The health department offers weekly talks; the highway department, during the summer months, furnishes the automobile owner with a report on road conditions; the agricultural department, as well as the department of farms and markets, issues frequent bulletins of interest to the farmer, including in some bulletins special reports on weather reports. Last fall when there in the Adirondack mountains forced a suspension of hunting, WGY was used by the governor and by the conservation commission in warning those already in the woods that an emergency existed and that hunting was barred. One of the first and most interesting of Albany programs was the broadcasting of the inauguration address of Gov. Nathan L. Miller.

Referendum Already Taken

Governor Smith, as well as the Republican leaders whom he has opposed, have recognized the growing importance of Radio in legislative matters and have used the facilities of WGY to take a Radio referendum on speeding legislation. In March of this year when Governor Smith found his plans on a financial program opposed by opponents to the people by Radio discussing the subject, "Speeding the People's Money." The response from the audience, conveyed directly to the elected representatives, resulted in hastening the views of the governor and the legislature.

A second Radio referendum on matters legislative was taken in June after Governor Smith had called a special session of the legislature to reconsider the pack program.

Before the legislature convened in special session Governor Smith broadcast his views from WGY. His voice, amplified by the Radio power station, was carried to every part of the state. Wire lines also carried it to WJZ in New York, and this station broadcast the speech. Two nights later Senator John Kilgus, leader of the majority, replied to the governor and presented his side of the controversy. Still later Judge Alphonse T. Chaurwater, a member of the Niagara State Recreation commission, gave a Radio discussion on the issue.

The voters were thus able to hear both sides of the question and many of them wrote to the representatives in Albany requesting action on one side or the other.

Much of the shortness, length and general to multi-tube sets can be eliminated by the use of matched tubes.

BEAUTIFUL STUDIO IS INSPIRATION



"BETTER broadcasting begins with better studios, and that means arrangement and atmosphere," said Lieut. Conde E. P. McDonald, Jr., president of the National Association of Broadcasters and the Radio Radio corporation, "and we propose to press the point." The new superpower station, WJAZ, of the Radio company, now being built, will have probably the most beautiful studio in the world. The decorator's painting of the studio, with an inset photograph of Mr. McDonald, are shown above.

After being elevated briskly to the twenty-third story of the new Straus building, Chicago, where the Radio studios are located, one first enters into a reception room of unusually large dimensions, set with costly tapestries and carpeting and furnished in period furniture. To the right is an artistic gateway within which a massive art metal gate sits in the entrance. Flanking on either side by smaller archways are wrought iron grating benches which artistically built in benches are positioned. This room being given over exclusively as a lounge for visitors and artists.

Passing through a great archedway and into the studio proper one first comes upon a great wide veranda—giving the impression of having left the drawing room of a chateau and out into the garden.

In the center stands a massive art fountain of stone which adds a touch of realism with its tiny spray of water, somewhat sparkling and splashing the Japanese goldfish within its spacious reservoir. The garden tiled flooring are here and there offset by an occasional glass and other appropriate settings, all of which lends a touch of modern days and a silent effect that plays upon the emotions.

The Radio Station, WJAZ, however, has not left any details to the artists.

FORD AND GLENN BEGIN TRIP HOME

Lullaby Boys Drive Eastward to WLS and Leave Jazz Behind

CHICAGO—Ford Smith and Glenn Howell, the Lullaby Boys of WLS, Sears-Robinson station here, who left in June for the Pacific coast on a tour of the continent, are on their way home to Chicago, where they expect to arrive August 15 and resume their popular program. It has been announced today by Edgar L. Hill, director of the station, that Ford and Glenn, with their families, started June 2 in two automobiles on their transcontinental trip. On their way to the coast they broadcast many of their WLS features. From Seattle, where they broadcast over KJRH, they have just sent word that the WLS listeners may expect to hear their voices slightly again in Chicago about the middle of August.

Little Glenn writes that he is first listening to jazz programs in the West. "It's jazz everywhere," says Glenn, "and we found little of the best instrumental features we try to give over WLS."

Artificial Larynx in London

LONDON—The most novel mechanical voice yet broadcast from a British station was the sound generated on an artificial larynx recently invented by Sir Richard Page, the famous throat surgeon. Sir Richard declares the use of this device will enable dumb people to talk. (Herald's E. Gem, of American Radio Digest, did a fine job of translating it for WLS, Seattle—Singer's Note.)

BRITISH ANNOUNCER MUST BE VERSATILE

ENGLISH COMPANY WANTS WELL QUALIFIED MEN

After Landing Position It In Weeks Before New Announcers Speak Over Microphone

LONDON, Eng.—The British Broadcasting company, which requires several additional announcers, points out that applicants for the posts must have very exceptional qualifications. The following are the qualifications the B. B. C. lays down for the ideal announcer:

"He must have a pleasant, refined voice. He must possess a general knowledge of so many subjects as to allow to make him a walking encyclopedia. Consequently, university men are most suitable for the work.

"He must have personality so that 2,000,000 listeners receive the impression of having a friendly chat with him.

"He must be able to deal adequately and sympathetically with every subject broadcast.

"He must be cultured and know how to be interesting on such a subject as chamber music, and be able to discuss plays and the hundred and one things that concern the microphone's hearing.

"He must keep listeners happy through the whole program.

"He must be witty without being funny, and smart without being sarcastic."

With only twenty-one stations to supply, the B. B. C. does not deem advisable to follow America's lead and inaugurate a proper announcer's course. When a suitable man is found he first spends his time listening to others and watching how they work. It is weeks before he is entrusted with reading a few items of "local news" on the radio.

Just to make his job a little more difficult, the B. B. C. expects the announcer also to be shown. They must describe the items so that they want to hear them.

KFVL Demolished by Fire

SEATTLE—The telephone and Radio exchange and Station KFVL, Vancouver, Wash., were destroyed when the building which they occupied was burned down by a fire of undetermined origin. The building was at Vancouver Barracks.

'Oklahoma Pepper Bird' Guest at KTHS, Hot Springs

HOT SPRINGS NATIONAL PARK, Ark.—Ray C. Griffin, known in Radio land as the "Oklahoma Pepper Bird" and organizer of the famous "Brown Derby" club at Station KFHU, Grove, Oklahoma, was a visitor at Station KTHS, the New Arlington Hotel Hot Springs, Ark., for several days recently. Mr. Griffin broadcast "The Voice of Oklahoma" through the KTHS "radio" and was shown the wooden of the National Park and its million dollar bath house row by Director G. C. Arroyo and Chief Taxidermist E. L. Otis.



A Revelation in Tone - Volume - Clarity

Here is a "loud speaker" that brings the artists into your very room, so realistic is its reproduction.

Piano music, the most difficult to reproduce, sounds so natural that you are carried away by its beauty.

Vocal selections retain all of the colorings of the artist. Orchestra music is a treat, every instrument can be heard, clear and full.

Magnetic diaphragm control—used exclusively in the Kellogg Unit—is the new principle that performs these wonders in radio reception.

No excess vibration, no chattering, every tone true.

The Kellogg Unit is available for use with a phonograph, and will reproduce voice or music with a full, sweet, clear tone.

A popular instrument. The Kellogg Symphony Reproducer is a revelation in Tone—Volume—Clarity.



At all good dealers "See Monthly Lead Speaker"

At your dealers for \$20—Hear one today

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Kellogg Symphony Reproducer

With every Kellogg Radio part, Use—Is The Test

Radio Digest

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A More Representative Democracy

USE of the Radio by an eastern governor to sound out the people on matters of grave importance pending before the state legislature points out a new and faster way for cooperation between voters and their representatives. The idea of appealing to voters to write to their state and national representatives is almost as old as legislatures, but the old method of appeal takes a great deal of time. It requires the enlistment of a large working force, and very often a great many public meetings to arouse public action. In one meeting, advertised by press and Radio, the speaker can reach by Radio a great audience and, if his arguments are presented in an orderly and effective way, he is assured of a response. If a sufficient number of letters is received, elected officials are almost certain to be swayed in their action by the sentiment expressed.

For three years the Radio audience has been saturated in the habit of writing letters of comment on programs and artists. The Radio stations have encouraged the habit because these letters are substitutes for the applause which a performer was accustomed to receive. It is quite natural, therefore, for a listener, after hearing in address and a request that he express his views, to write to assemblyman or senator.

A democracy with Radio should prove more representative than a democracy without Radio. Concerted approval or disapproval of a plan of legislative action may now speedily reach the attention of the elected official. Interest in state and national policies should no longer be limited to the casting of a ballot on election day. Common action, produced by a Radio address, should make the citizen feel that this is in fact a government of, for and by the people.

Making Politicians Think

"THE Place and the Power of Radio in Politics," is the title of a recent paper by Dr. Frank W. Elliot, of WDC fame and vice-president of the National Association of Broadcasters. The power of Radio in politics, we believe, has been very well displayed. Both President Coolidge and Candidate Davis last year found it much to their advantage to talk simultaneously from a chain of linked stations to audiences in every section of the country.

However, Dr. Elliot's paper is worth while. In it he has made a very careful analysis of the future of political Radio. In it he also says, "The (Radio's) power is to compel the politician to really think before broadcasting."

We hope Dr. Elliot is right. In that case perhaps we have misjudged the average run of politicians. We didn't even dream they ever thought. Except, of course, when it becomes necessary for them to think how they can better themselves to the detriment of someone else, usually the people.

But what can you expect when the best citizens refuse to use their franchise of citizenship to elect the kind of men who can and will think for the people, once they have been elected to office? Perhaps Radio will stimulate the interest in voting so necessary to our common good. That, we should say, would be the biggest thing Radio could ever do for this government.

A Billion Dollars for Radio

PREDICTIONS for the fall and winter Radio season are hitting high. A large show promoter conservatively estimates that half a billion dollars will be spent for Radio sets, parts and accessories during the next year. An official of a large set manufacturer says one billion dollars is closer to the mark.

Quite a growth? In 1923 the entire Radio business of the United States amounted up a bare two million dollars. Last season it is estimated that between three and five hundred million dollars was turned over in sales. Yes, quite a growth for a period of five years.

Beautiful sets, so handsome they overshadow the furniture of the parlors in which they are intended; perfect receivers, as good as science knows yet how to make, await the fall buying public.

Yes, we believe at least a half billion dollars will be spent this year. Why not?

RADIO INDI-GEST

Maybe She Swam

"A bit of human static was found on the air at 4:20 when the Daily Reveille's wood soprano flaring through that grand old song, "By the Waters of the Minnetonka," I hope Mrs. Supreme reads this and recognizes her identity." (Glover Douglas in Old Time).
"By the Waters of the Minnetonka"
Was the song the flapper tapped
And knowing water into the shore
That's the pun that Silver tapped.

Orders Radio in His Coffin

Sam R. Mitchell, aged 500 Fernando valley rancher, has placed an order with a Los Angeles undertaker for a \$1,500 steel coffin equipped with an in-to-date Radio receiving set. It was revealed today.—News Item.

In view of the foregoing, think what might have happened if certain characters of history had taken interest in their honored graves. For instance:

King Tut, broadcasting to those who would dig him up: "Please go 'way and let me sleep!"

Clasoptera, to those who have been handling out the dirt about her affair with Anthony: "I ain't that kind of a girl!"

Omoo Khayyan, to the publishers: "Cut out all reference to 'Dig of Wine' in revised U. S. A. version of Rubens!"

Maudie: "The world is wrong! I was not auto!"

Darwin, after hearing Bryan's Davison speech broadcast over WGN: "I meant to insist to the monkey group. I had no idea that the human race would ever produce a being such as W. J. B."

Schubert, Wagner, Mozart, and Beethoven, in answer over food station hook-up: "There is no Society of Authors, Publishers, and Composers here so we have turned the place Heaven."

The Old Stuff Goeth

"A pick-up was made by Station WGT in the night traffic court of Hoboken, N. J., and sent by land wire to WJL and broadcast in the metropolitan audience. Three men were tried for the benefit of the Radio fans, the first of which was for Drunken and Reckless Driving, the second for Driving without a License, and the last for Speeding. These were real honest to goodness cases and when the judge said \$50, the Radio audience should have been able to hear the lean drops scatter on the courtroom floor as the lawless offender walked with his woefully stressed." (From News)

Try this with your station!

"I'm late I know my darling wife,
But please let me explain—
I lost my watch and near my life
When a bomb held up the train.
"That's all the bomb," she said,
"A judge asked you for your dough
So having moonshine on the head—
I heard it over the Radio."

Another said, "I'm so sorry dear,
A friend was sick tonight,
So I had to lugger wear
and cheer him in his pitch.
"Get away with that old car,
Don't try to fool me,
Some nurse once called your bluff
I heard it over the Radio."

The old ones are now taken,
All the will have to go
With me it all on you
Over the Radio.

Miss Partington Returns

From away down in the Tar Heel state comes word that Miss Partington, with some months back a regular feature in this department, is heading a new right club and will soon be with us. "Hold your horses the elephants are coming!"

I Sure Is Good Says Elmer

By Delmer Hughes

I AM beginner to believe that I am pretty good. I once thought that I was somewhat superior to other human beings, but now I know I am. I am quite sure. Many people say I am prejudiced and don't know my stuff, but I know I do and they don't, so why worry?

The reason I am good is that I know that NWG is good. Nobody else would know it (unless I told 'em, so I write regularly telling people how wonderful I am and NWG are. I am afraid people don't appreciate my kind criticisms.

Why, if I don't criticize broadcasting stations I know my readers would surely take in some awful swat that I don't like and they would. And I couldn't stand that. I want them to take in NWG, which is always good. Hence, both. Now be careful, my kind readers, and don't tune in anything I say I don't like, because I am sure my heart would break.

Don't Forget the Stamps

Dear Ed: Why, oh, why do you scorn my contributions? I have sent you three wonderful poems and still I fail to see them in print. If you can't see there some thing back so I can submit them to the American Stationer. CRYSTAL SET ME.

Listen, Ed, it's this way. Two poems were beautiful, but evidently you have never heard the old one about "good comes come in short pieces." Cut them down or send a self-addressed and stamped envelope for their return.

Rebroadcasting the Old Ones

Dear Ed: I looked my act to the bed post during the warm weather last week and got "Hot Springs" GAP.

Summer Radios and Some Are Not



Condensed

BY DIELECTRIC

The symphony players again at KDKA, Pittsburgh, were all that one would expect whose receivers had played best on previous occasions. Despite the absence of any modernism to the music of the Magic Flute, few will deny the beauty of the overture to that opera, and it was this selection which won me to a prolonged hearing of that evening's program. Lucile Werner should be included where praise is being meted out, for her singing of "My Mother Bid Me Bind My Hair," a Madyn girl, was splendidly interpreted.

I ran across a good—real good—male quartet the other evening. Haven't found so many since these hot nights have come upon us. Yet that should not pass as explanation. Anyway, those four men did get right into the heart of a melody of old time airs, familiar to our grandmothers, and sang heartily, too. They never resorted to an overdose of pathos, yet their voices were soft with feeling where the "darkies" were referred to and the otherwise hackneyed phrases were newly presented. WSAI, Cincinnati, was responsible for our hearing such a program and we should thank them.

Another of the operatic programs from the studio of WEAF, New York, presented "Marta" (incidentally this is most closely associated in my mind with the great prima donna, Melba). These performances have gone a long way to acquaint many people with the beautiful melodies to be found in grand opera and to dispense the minds of some as to the real character of such musical productions. Mr. Benedetto has seldom failed to impress me with the seriousness of his art and the singing of Lancel was no exception.

Elgin, Ill., with its WTAS broadcasting station, has something to boast of, even if others outside the immediate vicinity had cause for complaint at times. They were well supplied with excellent material when the evening's entertainment consisted of a group of soloists and an orchestra. Diversity also not guarantees enjoyment, yet it is likely to meet the wishes of a large number of listeners, and that was precisely what WTAS gave.

It is very improbable that any old time listener would skip over the dial setting for WSB on the dedication date of the wonderful new transmitter at the Atlanta Biltmore hotel. To me it seems as though the "Voice of the South" is synonymous with Radio broadcasting. Each step this dear old southern station has taken, since Dielectric always on hand to rejoice with the owners of one of the most friendly and interesting stations in the land. Three years' reminiscence was crowded into that one program and few of the genuine BCL's tuned out without wishing them all the success in the world. Landon Kay is a name thousands do not recognize, though that genial gentleman's voice could not be mistaken for.

Symphony orchestras are no longer the delight of those only who park concert halls—thank fortune—but are enjoyed and are the instructors of thousands of Radio listeners today. Comparisons are not in order here and I have no desire to make any, but to say music lover missing the concert given by the Detroit symphony orchestra recently, I have only sympathy. It was a better evening in the history of classical music broadcasting and if such a program is again presented be sure to get there early. WCK be thanked.

A. B. C. Course in Radio Fundamentals

Chapter XX—Characteristics of Two and Three Electrode Tubes

By David Penn Moreton

Let us first consider what happens in a two electrode vacuum tube, in which there is a good vacuum, when there is first a variation in the temperature of the filament and secondly, a variation in the voltage of the battery connected between the plate and the filament. The connections of the tube for this investigation are shown in figure 33.

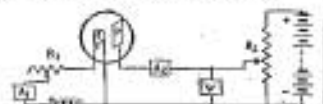


Figure 33

The current through the filament may be varied in value by means of the rheostat R_1 , and the value of this current is indicated by the ammeter A_1 . The voltage applied between the plate and the filament may be varied in value by moving the sliding contact C along the rheostat R_3 , the value of the voltage being indicated by the voltmeter V , and the value of the current in this circuit by the milliammeter A_2 .

Space Charge

Suppose now, that the voltage between the plate and the filament is kept at some constant value and the filament temperature is gradually raised by increasing the filament current. The number of electrons sent out by the filament will continue to increase as the temperature of the filament rises, and there will be a stream of electrons passing from the filament to the plate. Due to this stream of electrons passing from the filament to the plate, there are, at any instant, a number of electrons in the space between the filament and the plate.

This group or cloud of electrons, between the plate and the filament, produces a negative space charge. The effect of this negative space charge upon the electrons leaving the filament is opposite to that of the positive plate potential. As the temperature of the filament is increased, there will be an increase in the electrons between the plate and filament and, hence, an increase in the value of the space charge, until finally the space charge neutralizes the plate potential and there is no further increase in the plate current due to an increase in filament temperature. The tendency of the filament to emit more electrons per second, due to the increased temperature, is offset by the space charge effect which retards the electrons toward the filament so that the net number emitted remains constant.

If the voltage between the plate and the filament is increased, there will be an increase in the current as indicated by the milliammeter A_2 in figure 33. With this higher voltage connected to the plate, a larger space charge will be required to offset the effect of the plate potential.

The variation in plate current with filament temperature is shown graphically in figure 34, for three different voltages

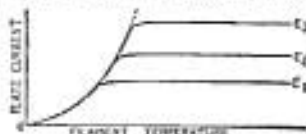


Figure 34

between the filament and the plate. Let us now assume that the filament temperature is kept constant and the voltage between the plate and the filament is varied. There will be a definite number of electrons emitted by the filament each second. The magnitude of the plate current will depend upon the number of electrons reaching the plate per second, which in turn depends upon the potential of the plate. The current increasing in value as the voltage between the plate and the filament increases in value. As this voltage is increased, a value is finally reached at which all the electrons emitted by the filament arrive at the plate. When this value of plate voltage is reached, the plate current is a maximum and this value of the current is called the saturation current for that particular filament temperature.



Figure 35

saturation current for that particular filament temperature.

The variation in plate current with plate potential is shown by curve T_1 in figure 35. This curve shows that when the plate potential is zero, there is no plate current and, as the plate potential increases, there is at first a very small increase in plate current, but as the plate potential continues to increase, the plate current increases more rapidly than the plate potential up to a certain point, when the plate current has reached the saturation value as explained above.

If the temperature of the filament is raised to a higher constant value by increasing the current through it, and the

plate potential varied in value from zero upwards, the plate current will increase with the plate potential along the same line as it did for the lower filament temperature until the saturation point is reached and the filament current will rise higher in value than it did before as shown by the curve marked T_2 . A further increase in filament temperature will give the curve marked T_3 .

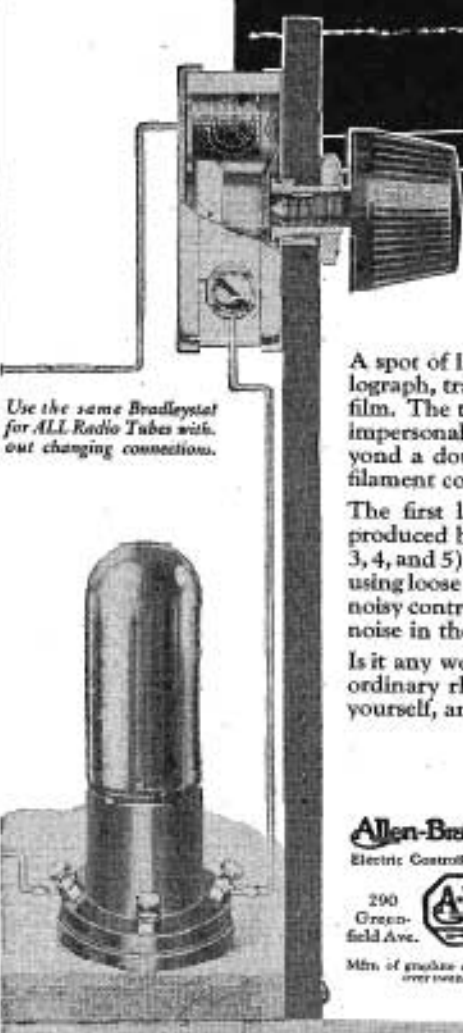
Three Electrode Vacuum Tube

The three electrode vacuum tube differs from the two electrode tube described in the last chapter, in the addition of a third electrode G , as shown in figure 36, between the plate and the filament and in the path of the electrons. This electrode

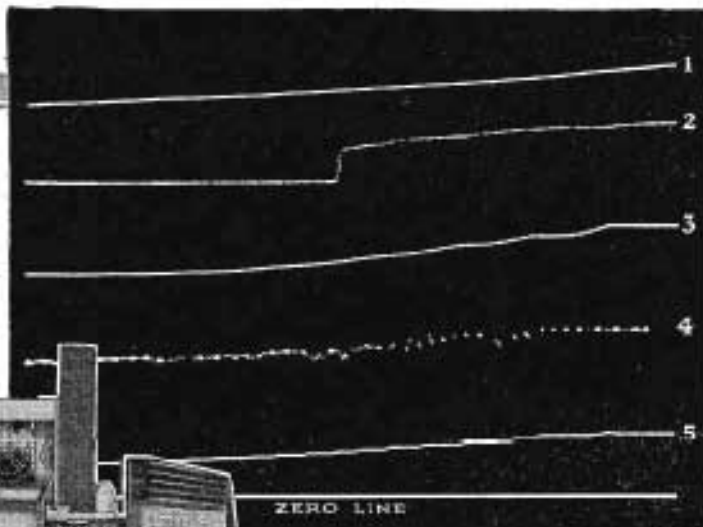
may be a perforated plate or mesh or grid of fine wires, through the openings of which the electrons must pass in their travel from the filament to the plate. It is possible to accelerate or decelerate the electrons moving from the filament to the plate, and to concentrate or disperse them at will the effect of the space charge, by applying a positive or negative potential to this third electrode or grid. This third electrode provides a means of controlling the current in the plate circuit, without changing the plate potential or filament temperature. The chief advantage of this method of controlling the plate current is that, while the plate current may be

(Continued on page 19)

Bradleystat
PERFECT FILAMENT CONTROL.
The result of more than twenty years' research and experience in the manufacture of graphite disc rheostats for radio, mines, mills, etc.



Use the same Bradleystat for ALL Radio Tubes without changing connections.



Only Graphite Discs provide noiseless filament control

A spot of light, silently guided by an automatic electric oscillograph, traced the above curves on a moving photographic film. The test, made at the University of Wisconsin, was impersonal and impartial. The result, however, proves beyond a doubt the superiority of the Bradleystat for radio filament control.

The first line (No. 1) shows the silent, stepless variation produced by the Bradleystat. The following curves (Nos. 2, 3, 4, and 5) were produced by other types of rheostats, some using loose powder instead of graphite discs. See the scratchy, noisy control. Every jog in the white lines means a distracting noise in the loud-speaker.

Is it any wonder that Bradleystats are being substituted for ordinary rheostats by thousands of set owners? Try one, yourself, and hear the difference!

Mail the Coupon for Literature

Allen-Bradley Co.
Electric Controlling Apparatus

290 Greenfield Ave. Milwaukee, Wis.
Mfrs. of graphite disc rheostats for over twenty years.

Allen-Bradley Co.
290 Greenfield Ave., Milwaukee, Wis.
Please send me your latest literature on the Allen-Bradley line of radio devices.
Name.....
Address.....

Radio Inductive Interference and Its Cure

Part II—Means of Suppression

By Radio Branch, Dept. Marine and Fisheries, Canada

IN MAKING all these tests it is important to approach the subject with an unprejudiced mind as to the source of the interference, and before commencing any work, it is well to consider all possible conditions in which the interference may have originated from some other unknown cause. Investigating interference is a very interesting detective game and one would sometimes imagine that the source of the interference had a sense of humor and was trying to evade detection in a manner similar to that of the most clever criminal.

The various and more satisfactory means of suppressing Radio Inductive

Interference are especially removed from the hole in the tube to be cut in the insulation. End rings or filers are wound at the end of the winding to build up the noise diameter to the outside diameter of the winding. These may be made of tape or a suitable size of wire tube. The whole coil is covered with five layers of Esmitt stock and then taped with black friction tape and painted with insulating varnish. Mounting legs made of fibre are then attached to each end of the coil.

This coil should be mounted on a board covered with asbestos $\frac{1}{2}$ inch thick and the leads soldered and thoroughly taped according to standard wiring practice.

a choke coil and thus prevent the necessity of adding additional choke coils to the system.

Electric Motor Interference

A series commutator motor, causing a surge by sparking at the brushes, may have its leads reversed to reduce the Radio interference. Where the wire is grounded, Radio interference from such a motor is sometimes reduced by reversing the leads supplying the motor, so that one of the brushes is connected to the ground side of the line and the field coil is connected to the live side of the line. In this case, the field coil is used as a choke. It may also be necessary to place a condenser of one or two microfarads

across the brushes. (It may be determined by means of a test lamp connected from ground, first to one wire and then to the other. The lamp will light when connected from the live line to ground.)

Battery Chargers and High Flashers

A battery charger of the vibrator type may be prevented from causing interference by connecting a condenser of $\frac{1}{2}$ microfarad capacity across the vibrating contacts. In the case of battery chargers it is useless to put condensers across the motor, as it is necessary to make use of the choke consisting of the wire and coil within the battery charger. In preventing this surge from getting out on the line, flashing electric signs may usually be

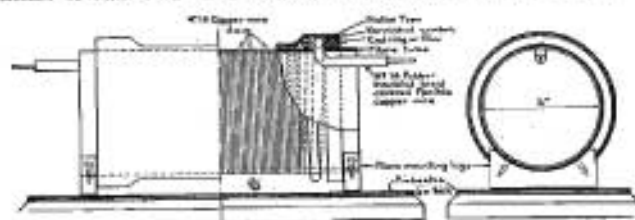


Figure 1

interference which is caused by electrical apparatus which is defective in its operation in good condition. The source of such electrical apparatus are always very pleased to have their attention drawn to the fact that their apparatus is in need of repair. It having been found many times that this Radio interference is the first indication of a fault, which if not attended to, may cause serious damage.

In cases where the electrical apparatus appears to be in good mechanical and electrical condition it is very often possible to supply some means of preventing electrical surges originating in the apparatus from getting out on the power line where they would radiate and cause interference.

Condenser Prevents Surges Traveling

These electrical surges have the property of passing through condensers more readily than through substances. The method employed therefore, in preventing electrical surges from traveling along the power lines and thus causing Radio interference, is to provide a path to ground in the form of a condenser in line or shunt of this surge. In order to make this filter more effective, it is often advisable to introduce between the line and the source of the disturbance a trap which will make the passage of the surge more difficult. This trap preferably takes the form of a choke coil which consists of a number of turns of wire of suffi-

Mounting Condensers

Condensers which will stand a test voltage of 1,400 volts direct current may be substituted across an alternating current or direct current circuit of 250 volts or less. On circuits which are protected by fuses of not more than 15 ampere capacity, no additional fuse is required for the condenser. On circuits protected by fuses of greater than 15 ampere capacity, a separate circuit fuse and switch must be installed between the condenser and such ungrounded power wires. Where condensers are not installed in metal boxes and are to be placed on wooden surfaces, they should be mounted on pads of asbestos at least $\frac{1}{2}$ inch thick, and these pads should be sufficiently large to extend beyond the edges and the holding the condenser in place.

Where condensers are to be used on two-volt circuits, two condensers of the approved type must be connected in series between the lines and the common point which is grounded. In such installations the condensers are to be protected by 400-volt fuses not greater than 15 amperes in each line line, and both the condensers and fuses are to be enclosed in a grounded metal case. Where the condensers are to be connected to two-phase or three-phase circuits not greater than 600 volts, one condenser may be connected from each live line to ground and installed with fuses as stated above.

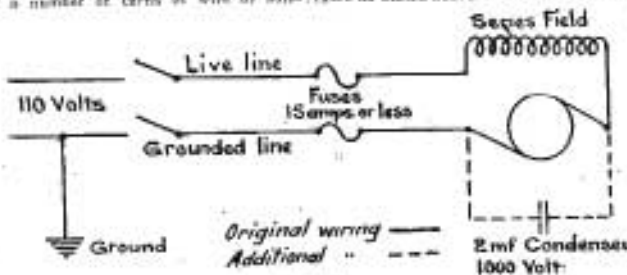


Figure 2

cient also to carry the required current without overheating, and sufficient insulation to withstand the voltage of the line. These installations should be approved by the local electrical inspector to ensure that there are no fire or accident hazards introduced by the installation.

It is important in the design of these choke coils that they should have low distributed capacity in order to prevent electrical surges passing through the choke coil by means of this capacity.

Choke Coil Construction

A type of choke coil recommended for areas where the current is less than three amperes is constructed according to figure 1. It consists of 124 turns of number 18 double cotton covered copper wire in a single layer wound on a fibre tube $\frac{3}{4}$ inch in diameter, $\frac{1}{2}$ inch thick. Leads are soldered to each end and made from number 14 flexible rubber insulated braided covered copper wire, exiting one turn around the tube and extending through the hole in the tube and extending through the inside of the tube a length of one foot.

As these condensers contain wax, they should not be placed where they may be subjected to excessive heat. Condensers when connected in a circuit as stated above have no objectionable effect on the circuit, or the operation of any electrical apparatus and they do not consume any power.

Approved Condensers

Condensers similar to Northern Electric Company Type B-21-A-A, 1 mfd., 1,000 volts direct current, are suitable for installing in metal boxes as described above. Special condensers having number 14 rubber insulated leads, suitable for installing without metal boxes, may be obtained at cost from the Radio Branch, Department of Marine and Fisheries, Ottawa, until such time as commercial firm stocks them. (This probably only applies to Canadian firms—Editor's Note.)

In every case it is possible to make slight changes in the connections of the electrical apparatus causing the surge in order to see some existing apparatus of

capacity across the brushes. See figure 3.

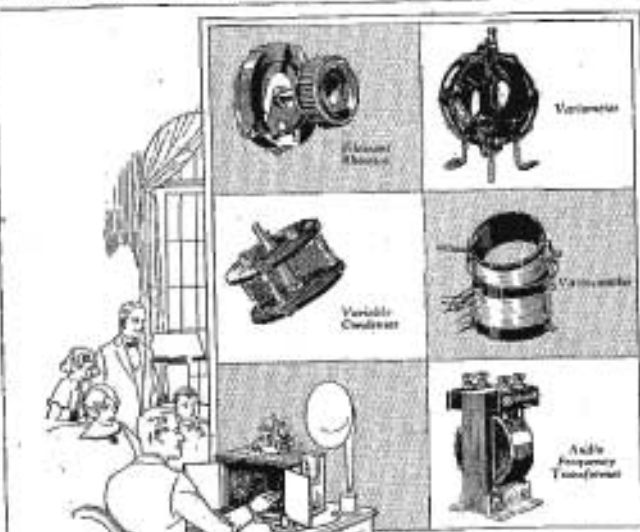
In cases where neither side of the line is grounded, a choke may be inserted on the line connected directly to one of the brushes, while the field coil may act as a choke in the other line. In this case it is recommended to use two 2-microfarad condensers in series and ground the middle point according to the diagram, figure 3.

In cases where it is not convenient to make connections with the brushes of a motor, the condenser may be placed across the line as near the motor as possible, and a choke coil may be inserted in the live line when necessary. Instructions for the installation of these units were given above. The live side of a line

presented from causing interference by connected condensers from $\frac{1}{2}$ to 2 microfarads capacity across the contacts of the circuit breaker. As the Radio interference from such sources depends upon the conditions of the installation, it is necessary to make these few experiments, as suggested above, in each case, in order to reduce the interference most effectively.

Sometimes the interference from a flashing neon illumination is caused by sparking at the commutator of the motor which drives the flasher. This may usually be determined by the nature of the sound in the Radio receiver and may be remedied by the method described for

(Continued on page 19)



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Standard RADIO Products

Interesting Work With Oscillating Crystals

Zincite (ZnO) Used By Russian Engineer

By Frederic M. Delano

THE term "oscillating crystal" has been a standard jargon among the Radio fraternity for a number of years since it was presumed that the usual crystal rectifiers, as used in reception, were incapable of oscillation and could pass radio frequency current in but one direction. Yet, strange to say this seeming impossibility has now become not only a possibility, but a workable reality.

The oscillating crystal was first developed by a Russian, M. Lessee, and it has been attracting considerable attention in Europe this past few months, with some comment in the press of America. Many and remarkable are the tests, hook-ups and results gained by the Radio amateurs on the Continent and the British Isles. Among the most important perhaps, from the standpoint of practicability, and utility for the average amateur, are those worked out and actually tested with success by one of M. Lessee's friends, M. Vinogradov, a Radio engineer formerly with a Belgian Radio company and now doing some special Radio work for one of the largest technical magazines in Europe.

Develops Lessee's Circuit

The basic hook-up from which these were worked out, by the way, is not the construction of Vinogradov, but he has taken the original idea of Lessee and worked out refinements and things that formed, ultimately, the circuit shown herewith. Vinogradov says that while there is a wide difference of opinion in Europe, the one group of scientists claiming the oscillating crystal useless, the other group that it will soon replace the vacuum tube, he personally is reporting only what he has done himself.

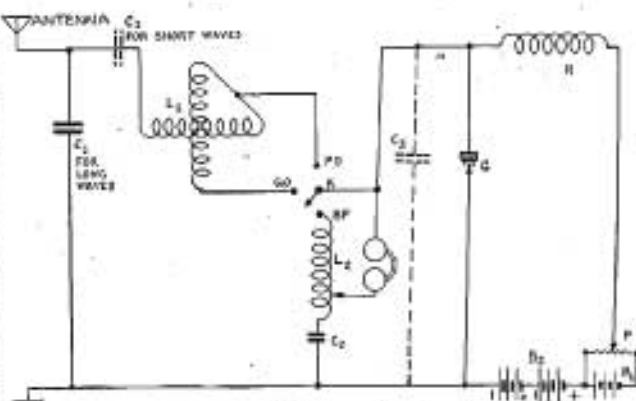
The diagram gives an idea of a receiver made with the Zincite crystal, and, as shown without detail lines, allows for the reception of the lower wave lengths from 2,000 to 12,000 meters. The batteries, B-1 and B-2 are ordinary dry batteries such as are used in America as C units; B-1 providing 4½ volts at the terminals and B-2 giving 6 volts since two C units are placed in series. Potentiometer P has a resistance of about 100 ohms (standard on the American market) and may be made of 2 meters—about 25 feet 8 inches—of nichrome wire, 1 mm. in thickness.

The unit R is about 990 turns and should have as large an inductance as possible, a very low distributed capacity and be wound in sections on a multi-slotted coil. Fill the slot narrow slot, then pass to the next and then to the third, much as when winding an untuned radio frequency transformer. It is a good idea to wind with varnished or silk insulated copper wire of about 1 mm. thickness (No. 22 B. & S.) of which about 1,200 feet will be necessary.

The Tuning Circuit

Coil L-3 should have an inductance of about 0.02 henry, and can be wound on a wooden slotted form 48 mm. (1¾ inches) long by 25 mm. (1¼ inch) in diameter. For this, some 675 feet of insulated copper wire will be used, 2 mm. to 4 mm. in diameter (No. 24 B. & S. to No. 28 B. & S.). Two transformer coils, one of 250 turns and one of 100 turns, can be used. If the inductance is wound by the experimenter, he must be careful to arrange for a tap at the fifth turn for the connection to the head receiver.

The condenser C-3 should be of 0.25 mfd. capacity. These also are for sale in the United States, but if the experimenter



Many an interesting hour can be had experimenting with this hook-up.

wishes to make this unit himself, he must be careful to have each metallic surface of 14,425 square centimeters, if he uses paraffin paper 1.1 mm. thick for dielectric. Condenser C-3 has a capacity of 85 mfd. and the surface of each armature (metallic surface) should be 650 square centimeters for paraffin paper.

Editor's Note.—Either Mr. Delano meant the dimension for the first unit to read 14,425 or that for the second to read 850, as obviously the area for the 85 mfd. unit should be larger than that for the 8.01 mfd. unit.

The variometer is made of two coils turning one within the other. The outer coil or stator, being composed of two sections of 28 turns each, wound with 3 mm. to 5 mm. wire (No. 18 B. & S. to No. 22 B. & S.). The inner or rotor part of the variometer is composed of six sections of 16 turns each, of the same size wire.

The Zincite Crystal

The detector is composed of a pointed steel wire of 2 mm. (No. 26 B. & S.) wound in a spiral, and the Zincite crystal (ZnO) mounted in a cup or held by a strong clip. Any of the usual crystal detector mountings can be used at this point. The entire unit, however, should be placed on a piece of felt or soft rubber to increase the stability of the system, and connections to it should be of very flexible wire. The cracks in the crystal itself should be red and the surface black. It is the red part which contains the sensitive points.

The three contact points of the commutator (switch) K should be widely enough separated to avoid all possibility of two of these contacts being covered or touched by the wiper blade at the same time. For reception below 1,875 meters, and this includes the American broadcast band of course, the connections shown in dashed lines should be used. Condenser C-1 is shifted from its position across the aerial and ground and placed in series with the aerial lead-in and variometer. The condenser C-2 has a capacity of .004 mfd.

Operation of Circuit

For proper functioning of either of these sets, the switch K should be placed

on the position EF while the steel point of the wiper is placed on the red part of the crystal; at the same time move the potentiometer P slowly. In the head receiver will be heard the usual whistling of low frequency oscillations produced in the circuit C-2 and L-2. Search the crystal for a more sensitive point if the first tried fails to produce this whistling, and when this spot is found place the switch K in the position FO or GO according to whether the upper or lower wave length range is required; FO for short waves, GO for longer ones. Turn the variometer L-3 to bring in the station desired.

At this moment, the continued oscillations are heard in the circuit L-3 and C-3 and the set is operating like the ordinary autodyne (European term). Contin-

uous wave stations are now heard in whistling notes, damped waves on a sort of blowing note. By means of the potentiometer P, the maximum intensity can be found in just the same manner as one works with regeneration in ordinary tube sets.

(No effort has been made to describe the construction of a complete set or there is no precedent on which to determine the extent of interest in this subject among American broadcast listeners. If the foregoing indicates sufficient interest among Radio Digest readers, the technical department will be glad to secure more articles and do more research work with the Zincite crystals.—Editor's Note.)

A. B. C. RADIO COURSE

(Continued from page 17)

quite large, and the energy transferred in the plate circuit quite considerable, but the energy required to charge the grid to the desired potential is extremely small, on account of the small capacity between the grid and the filament.

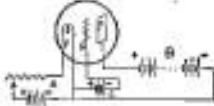


Figure 56

The operation of the three-electrode vacuum tube may be explained as follows: The tube will operate like a two-electrode tube provided there is no potential difference established between the grid and the filament. Now if the grid is given a negative potential with respect to the filament, for example by connecting a battery, C, with its plus terminal to the filament and its negative terminal to the grid, as shown in Figure 56, the space charge effect of the tube will be

(Continued on page 21)

Another Ad That We Did Not Write

ALL-AMERICAN

Aurora, Ill.
May 25, 1924.

All-American Radio Corp.,
Chicago, Illinois.

Are you the firm that makes the All-American transformers? If so, you sure got the right dope, as I have been helping make different radio outfits and when we used it we always found it right there with the goods. I have tried R-21, R-13, R-12, and all I have to say about it there is none better. R-13 is a bird, and when I sold one of the boys to get one, this is what he says about it, "No one testing that one out—she's there." And when a bug says that it is enough.

Yours truly,
(Signed) N. R. Diamond,
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ALL-AMERICAN RADIO CORP.
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MAGNATRONS

A GLASS, a base and some hanks of wire—Kipling would have said about vacuum tubes. And so they are. But what a difference the method of assembly and manufacture makes!

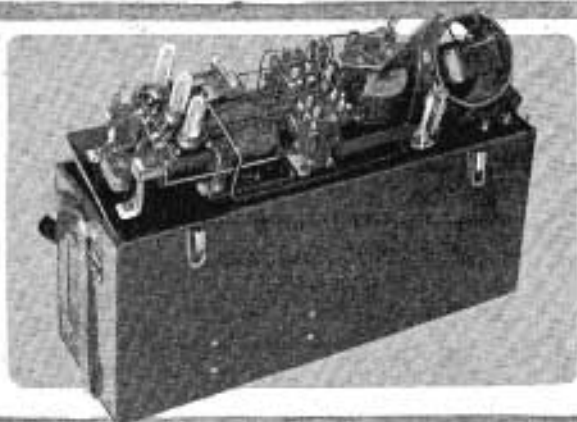
MAGNATRONS are built with the precision of a fine watch, and tested just as carefully before they leave the factory. You can always count on MAGNATRONS to get the most and the best out of your set.

Your dealer sells Magnatrons in the type 202-A, 150, and 100 large base.

CONNERT ELECTRIC LABORATORIES
Magazine Building Hoboken N. J.

ALL-AMERICAN

Largest Selling Transformers in the World



Back of panel view of the department's trunk-shooting receiver.

INDUCTIVE TROUBLES

(Continued from page 18)

feeding with interference from commutator motors.

Internal combustion engine ignition systems may cause Radio interference, but this is usually of a very local nature. This, however, may be considerably reduced by making the leads from the magnets of spark coil to the engine as short as possible and running them in a grounded shield such as metal conduit or lead covered cable. The fringes of the engine, magnets, and all shields should be thoroughly grounded.

Rotary converters sometimes cause Radio inductive interference by producing

for bleaching purposes in flour mills sometimes cause Radio inductive interference by producing a surge which travels along primary lines supplying the motor. This interference may easily be eliminated by connecting two choke coils of the cylindrical type previously described one in each of the low voltage lines placed as near as possible to the separator.

Portable Detection Receiver

Two illustrations are reproduced with this article showing the set used by the department for locating Radio inductive interferences. This set was also readily discernible in the rear of the truck shown with the first article. The diagram used for connecting the various units is given here as figure 4, and the reader living in the United States will probably at once be struck with the fact that tube elements are connected in series while most of the American circuits use the filament in parallel. This is due to the fact that Northern Electric tubes of the "vac-

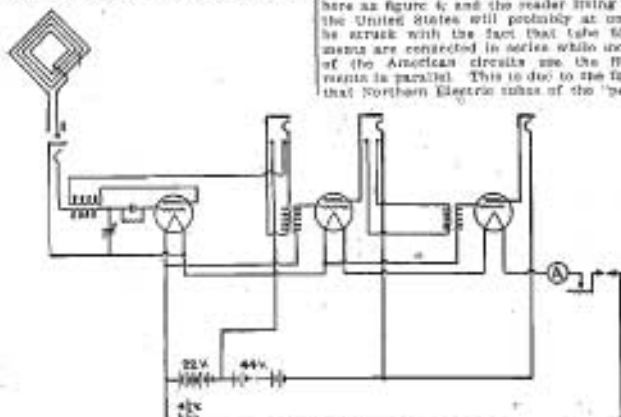


Figure 4

A surge which travels out both on the alternating and direct current lines. In some such cases it may be necessary to introduce choke coils into the alternating current lines and put condensers across the lines between the choke coils and the converter. Before putting these choke coils in the alternating current lines, it is recommended to try the effect of condensers across the brushes as described previously for the case of commutator motors.

Electric oscillators which are used for agitating the air in large buildings and

"vac" type were used, which require a filament voltage of 60-113. The power source usually consists of a 4.5-volt dry cell so it is logical to light three of these tubes in series from a 4.5-volt battery. The reader can readily change the filament connections to suit the tubes used, however.

The specifications for this set are as follows: The loop is to be pancake wound, outside turn 22 inches square and consisting of 14 turns, spaced $\frac{1}{2}$ inch. Plate coil consists of 50 turns of number 18 en.

(Continued on page 22)



filament vibrator is not essential to success if engine is primitive.

The New Radio Book



How to understand radio, assemble circuits, improve reception, operate sets,

EVERY phase of Radio reception gathered into one book at last! Explanation of elementary principles, directions for constructing parts, detailed how-to-build articles for the assembly of sets, operating directions on popular manufactured outfits.

Haven't you often wondered what all the spirals, wriggly lines and zig-zag lines were about on diagrams? A big chart shows you a picture of the part as you see it and, beside the picture, the symbol used in diagrams. Other articles show clearly just what happens within the mysterious little vacuum tubes that glow hour after hour within your set, apparently without change, yet pass every note of a jazz orchestra or soprano.

Antennas, for whose erection there are seemingly no rules, are covered fully; the reason for a long wire in some locations and a short one in others, is readily grasped by anyone. Crystal sets, one tubers, two tube reflexes, three tube regenerative and reflex outfits, four tube R. F. and neutrodynes, five tube assemblies—all types are presented up to the nine tube "super," king of the air.

For the Man That Bought His Set

For the non-technically inclined there is a two-color broadcast map of the country, operating schedules of all the leading stations, call letters and power rating of every station on the air, suggestions for the care of batteries and tubes.

No matter what type of receiver you own, there are dozens of valuable suggestions on tuning, trouble shooting and operating. Your head receivers, loud speaker, antenna and certain parts within the set, require frequent cleaning, adjusting and care. Interference and its remedies are factors you should understand even though you care nothing about "what makes it go."

Compiled by the technical staff of Radio Digest, it represents the high lights of the past twelve months in the Radio field. All this data is indexed for ready reference and logically arranged. Only a few thousand have been printed and this offer will stand for a limited time. The only book of its kind and is FREE with one year's subscription to Radio Digest. This offer good only on subscriptions sent directly to this office, not through agents or agencies.

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Questions and Answers

Selectivity vs. Range

(14102) OEL, Big Horn, Mont.

Q.—I have a five tube Radio set. I do not have very good luck in being able to separate one station from another in a range of 5 degrees. Stations KOD, WCHB, WLS, and WDAF are all strong stations and when they are all on the air about the same time, unless the air is very clear, will give me quite a good deal of trouble in separating.

A.—I use an antenna of 1-strand plain No. 22 gauge phosphor bronze wire 100 feet long, stretched taut at a height of 25 to 35 feet high and a lead-in wire of 25 feet, insulated. I have it stretched in a southeast direction from the set. Does it make any difference as to the direction the antenna is stretched from the receiving set? Would I have better receiving if I used another kind of antenna? I do not have any of the described city notes to trouble me as I live 10 miles from the nearest electrical appliances. How can you tell whether the ground wire is well grounded or not with this set? If you haven't a battery voltmeter to test B batteries how can I tell when they are about run down? Is there any disadvantage in using four 22½-volt B batteries rather than two 45-volt B batteries?

A.—Are any of the static eliminators advertised in the Radio Digest of big enough to pay me to add one to my set? If so, which one would you recommend me buying or can you give me some recommendation I may add to my set to help eliminate some of this summer static. As the Radio Digest does not receive compensation for answering questions, will make up for it by trying to get circulation enlarged among my neighbors this coming fall and winter.

A.—Relative to your difficulty with selectivity, or the lack of it, we wish to advise that on this receiver, or any other of similar type, you cannot have a constant range or a Chicago or San Francisco range in summer and still have selectivity. Part of the trade-off range which you have is the result of your use of a 125-ft. antenna when and in the winter's position it will be impossible to have good selectivity with such a comparatively long aerial. If you will cut down the length of the straightaway wire to about 85 feet, which will give you an over all length of 75 feet, including lead-in, the selectivity should be considerably helped. There is no way of testing for a good ground other than putting in the very best that you can with well soldered connections or putting in three or four to different points such as the cold water system, the radiator and anything else you can think of, and use them all at once. There is no way of testing B batteries without the use of a meter. There is no difference in efficiency between the use of four 22½-volt B batteries as against two 45-volt B batteries.

Although the static eliminators advertised in Radio Digest will work in some locations and eliminate about 25 to 45 percent of the static, none of them will work in all locations nor will they eliminate more than about 40 percent of the static without a noticeable decrease in volume. The writer neglected to mention above that shortening the aerial from 100 to 85 feet will slightly decrease the volume and may make reception of a few very distant stations impossible in some locations.

ATTENTION please. Is it worth the cost and an hour's work to you to improve your tuning? If so the will bring you complete data of a device that you should not be without. St. Paul Radio Improvement Co., P. O. Box 3152-St. Paul, Minn.

near time but the selectivity on those that you can still hear with loud speaker volume will be much improved and next fall and winter you will again be able to have a constant range.

Ground and Aerial with Super-het

(14114) CM, Evansville, Ind.

In your May 13, 17 and 24, 1924 issues of the Radio Digest you described an eight tube super-heterodyne receiver made to work on a loop and I want to know how I can adapt this receiver to work on a regular outside aerial and ground. Also in your June 27, 1925 issue you described an eight tube super-heterodyne receiver made to work on a loop and I want to know how I can adapt this receiver to work on a regular outside aerial and ground.

A.—We wish to advise that any super-heterodyne designed to work on a loop aerial can be used with an outside antenna by connecting the two terminals intended for the loop leads to the secondary terminals of an antenna coupler. Such a coupler should have about 42 turns on a 2-inch tube or 50 turns on a 2½-inch tube as a secondary while the primary should have from 8 to 14 turns. The coupling between primary and secondary should probably be very loose and the primary should be on a core. In case the super-heterodyne is designed for a center tap loop, the center point of the secondary coil should be determined and the three terminals from the receiver connected to the two ends and the center point exactly as though it were a loop aerial. See diagrams and wire details information we refer you to our issue of March 7 in which we started a series on the Four Filter Super-heterodyne and the first article showed the connections whereby this super het may be connected to a loop by plugging in two jacks or connected to an antenna coupler automatically by withdrawing the loop jacks.

To Check Lower Waves

(14008) FR, Scarsdale, Ill.

I have a homemade condenser which works fairly good except that I cannot get stations much below 275 meters. My condenser is as shown in my sketch. I am using Cardwell 15-plate condensers and homemade neutralizers having 3 turns of primary wound on 2½-inch tube (outside measure) and spaced about ¼-inch apart, 22 turns of secondary with a tap at the fifteenth turn and wound on 1-inch tubing (outside measure). I used 22-gauge wire covered wire. I would like to know what changes should be made in the neutralizers so that I could get down to about 225 meters.

A.—First of all tune in RYW, which you say comes in at about 54. Then disconnect the secondary of your second transformer from the grid of the second tube and take off about five turns. Do not touch the settings of the variable condensers while doing this. Then con-

nect the coils alphas and a new wire in few minutes. Start with full instructions etc. No money. Through Sales, Box 612, Port Wayne, Ind.

Radio Tubes Exchanged

Radio tubes of any type—new or used—any quantity—will be sold you at our lowest price. All orders filled. Write for our list. All orders filled. Write for our list. All orders filled. Write for our list. DAVENPORT RADIO CO., 217 S. LAUREL ST., CHICAGO, ILL.

nect the secondary to the grid and turn the second dial until RYW is again heard. Continue this process, leaving the first and third dials at their settings until RYW comes in at about 50 on your center dial. Do the same with the other two transformers and you will find that with RYW at 25 you can go much farther down on the wave length range and probably can hear stations at 220 meters. The set will have to be reneutralized, however, to allow for these changes.

Using Wrong Tubes?

(14105) PCH, Erie, Pa.

I have a Brainerd Super-het, all the parts, and it is a close looking outfit in the wiring and assembling. I have built it as specified in booklet that I got with the parts. The set has about radio frequency, three stages of intermediate radio frequency and two stages of audio frequency. The whistles and notes in the set caused by oscillation are something awful. It is the same with the loop on or off. In order to bring in a station I must turn the rheostat on full and the whistles and notes ruin all reception. I have been using condensers in all places in the set but the whistles and notes are the same. For grid voltage I have been using 3 to 3½ volts; for plate voltage, 90 to 110 volts; and for detector voltage, 45 volts. Grid leaks have been tried in all capacities. It is a Brainerd refocused super-het using 1 201A tubes, Ill. No. B-128, cabinet size 10½x12½ inches.

A.—We wish to advise that the probable cause of your trouble is that you are using the Brainerd set designed for 125 tubes with tubes of the 201A class. The refocused super-heterodyne will all work well with 125 tubes but they do not work well with the 201A tubes. You might write to the manufacturers of this kit and see what they can suggest.

Underground Aerial Cuts Static

(14005) LFW, Cretney Springs, Kan.

Which gives more volume, UV-129 tubes or UV-217? How does the new kind of instrument devised which will reduce static a little at least?

A.—We wish to advise first of all that the 201A tube will give more volume than the UV-129. The energy that will be delivered by a tube may be measured by the amount of filament energy consumed and this may be figured by multiplying the volts through the filament. Since 3 times 25 is greater than 2 times 55, the 201A gives the greater volume. There has been a device or instrument developed that will reduce static considerably and under all conditions. An underground antenna, such as was recently described by Mr. E. T. Jones in Radio Digest, will work to the majority of cases and will reduce about 90 per cent of the static.

INDUCTIVE TROUBLES

(Continued from page 20)

wire wound on a 2½-inch tube. The grid coil is composed of 40 turns of number 24 dia. wire wound on a 2-inch tube. Tuning condenser is of 6000 mfd. maximum capacity and variable. For the tubes used, the rheostat has a resistance of 10 ohms and the ammeter a range of 3 to 3½ amperes. Grid condenser is fixed with a capacity of .0013 mfd. while the grid leak has a resistance of 2 megohms.

It will be noted that Jack number 3 is not wired in the usual way to permit of reception on the detector alone but is connected in such a manner as to provide wide amplification when it is desired to use auxiliary apparatus in connection with current variations audio frequency sets.



Volumes 8, 9, 10, 11 and 12

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