

Radio Digest

EVERY WEEK **Illustrated** PROGRAMS **15c**

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

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SATURDAY, MARCH 21, 1925

No. 11

RADIO AIDS NEWSPAPERS



Left, Miss Eleanor Mims, frequently heard from Station KSAC. She is one of the station's stars, and well liked by thousands of fans throughout the country.

1,500 Visit Station WLW One Sunday Afternoon

CINCINNATI, Ohio.—So great is the interest in the new Crosley super-power broadcasting station at Harrison, Ohio, that 1,500 people visited there one Sunday afternoon. It was a fine day and gave the enthusiasts an opportunity to get away from their receivers long enough to inspect the recently opened station which is connected by wires with the studios in this city. Visitors are always welcome to either the station or studios.

DUPUY SEES ADVANTAGES IN AIRPHONE

Broadcasts Not Harmful

Owner of "Petit Parisien," with 1,600,000 Circulation Daily, Is Optimistic on Future

(Exclusive to the Delmas Service)

PARIS, France.—That Radio will be an aid to the press, rather than a competitor, and serve to further expand the power of the printed word, both in advertising and in news columns, is the opinion of Senator Paul Dupuy, owner and publisher of "Le Petit Parisien," the biggest French daily, with a total circulation of 1,600,000, expressed to a reporter of the Delmas Service in a special interview.

Senator Dupuy, who is known not only among his countrymen, but also in other lands, as being one of the most progressive publishers of the times, has been watching with keenest interest the development of broadcasting; and has recently added to his list of news disseminating organs one of the most popular and modern broadcasting stations in Paris.

Phonograph Ruined Nothing

"Obviously," said the senator, continuing his discussion of the present all-absorbing question as to what Radio will do to the publishers, "one cannot tell exactly what will happen in relation to

(Continued on page 2)

NO WAR; INDIVIDUAL AIRPHONES TO COME

PREDICTS TEN CENTURIES WILL MAKE CHANGES

Dr. Fournier d'Albe, Famous Anglo-French Scientist, Gives Prophecy in New Book, "Quo Vadimus"

LONDON, England.—What will the world be like in a thousand years from now? And, more specifically, what development will have taken place in Radio by that time?

Dr. Fournier d'Albe, the famous Anglo-French scientist, sets out to answer these questions in his book "Quo Vadimus" just published here.

Everyone, according to Dr. d'Albe, will have his Radiophone, by which he can talk to a friend in any part of the whole world as easily as he calls up a neighbor nowadays—perhaps even more easily, for there will be no wrong numbers. Radio telescopes will bring before him the

(Continued on page 2)



Above, Sara Ann McCabe, coloratura soprano, who has created many friends by her wonderful singing from Station KYW. Right, Mrs. Homer DuBaré, soprano, is one of the famous artists of WWJ.



ENGINEER ACTS FAST DURING EMERGENCY

SCHENECTADY, N. Y.—So that Radiophones could hear a program broadcast from WJZ and WGY, A. B. Chamberlain, a WGY Radio engineer, sat on top of a telegraph pole at Poughkeepsie, N. Y., for three hours and "monitored" the wire carrying the program. When word was received here that the amplifier station at Poughkeepsie had burned to the ground, Mr. Chamberlain and his assistant hurried to the scene with temporary equipment and kept the line "in condition" until WJZ signed off.

BRUNSWICK STAGES SECOND MUSIC TEST

FIVE STATIONS BROADCAST CONTEST'S SELECTIONS

\$5,000 in Prizes Await Fans Who Can Name Artists and Selections Given

NEW YORK.—Complete success of the first Brunswick Music Memory contest, which ended with the broadcasting of the fourth and final February program February 24, has resulted in the second contest for the month of March. This second contest, in which listeners are competing for \$5,000 cash awards under similar conditions as in the first, consists of five one-hour broadcasts, March 3, 10, 17, 24 and 31, between the hours of 9 and 10, Eastern standard time, have been listed by Stations WJZ, New York; WOY, Schenectady; WRC, Washington; KDKA, Pittsburgh, and KYW, Chicago, for the Second Brunswick Music Memory contest broadcasts.

The music memory contest is unique in musical history. The broadcasting of unannounced programs by unnamed artists is a decided innovation in the broadcasting field. The February contest aroused national interest among radio listeners, and it is expected that the number of the contestants in the March contests will reach far above that of its predecessor.

In the forthcoming contest programs the names of instrumentalists and orchestras will be announced, the listeners being required to name the selections played. In the case of vocalists, the radio audience will be required to guess the names of the singers as well as of the compositions sung.

RADIO NEWSPAPER AID

(Continued from page 1)

any particular case. But in the first place, consider the gloomy forecasts of the pessimists who saw in the phonograph a certain re-creation of the opera and concert stage. Instead of keeping the people away from the theaters, it only brought a good knowledge of music to the homes of many more, and today new concert halls—new operas—new orchestras are springing up all about us.

Nor did the motion picture ruin the theater, as was so violently and certainly predicted by many at the beginning of the former's popularity. Today the theaters are even more crowded, and others are being built. Yet the motion picture theaters also continue to increase in number. They are so entirely different that there is not the slightest interference.

How Radio Helps; Not Hurts

"Later again, Radio came in, and was met by a storm of protest from all sides—the publishers, the theater managers, the phonograph manufacturers. They were all terrified at the thought of the public getting in their own homes what they had been accustomed to going out to see or hear. Yet today, rather than having killed the interest in the stage, in good phonograph records, or in interesting news items, Radio has brought a clearer knowledge of these things to the average man, and he is apt to go to see acted out something he has heard by Radio; he buys a phonograph record of a tune he has heard, so he can always have it; or he buys a newspaper in which he may find fuller reports of some event, such as a banquet, or prize fight, that he listened to the night before.

Convinced Radio Is Newspaper Aid

"But perhaps most important of all," continued Senator Dupuy, shifting his position slightly, so that he faced his interviewer more squarely—"most important of all, are the recent experiments of the Vienna broadcasting station regarding the broadcasting of want ads. Here is a chance for the newspapers who own broadcasting stations to show the public the real value of want advertisements, to get what they need—either employees or jobs.

"Yes, I am convinced that Radio will in the end prove to work to the great advantage of the newspaper," concluded the senator, as he rose. "But it will be, in a good measure, an indirect effect that we may gain."

DR. D'ALBE PREDICTION

(Continued from page 1)

features of the man or woman at the other end of the world.

This will be very difficult. War will cease in a bare hundred years from now, Dr. d'Albe prophesies. If any tribe or nation makes itself utterly obnoxious to its neighbors, however, it will be painlessly sterilized with "X-rays" (or even the "death ray") and thus disappear from the face of the earth.

A nice thought for humanitarians to digest!

PROF. D. P. MORETON WILL WRITE

THE securing of a series of twenty-six articles on Radio by Professor David Penn Moreton, B.Sc., E.E., is a feat of which Radio Digest feels duly proud. Professor Moreton has been connected with Armour Institute of Technology, Chicago, for twenty years and now holds the chair of associate professor of electrical engineering. While his name has not been heralded in the press of the country as the originator of anything "startling" or "revolutionary," those long in the Radio field know him as one of the soundest and most practical thinkers connected with the science.



David Penn Moreton

Many books, considered authoritative by the electrical industry, carry his name, among them being "Practical Applied Electricity," "Electrical Measurements and Meter Testing," "Armature Windings for AC and DC Machines" and "Electrical Equipment of the Motor Car."

The part of his work in which most of our readers will be interested and will most appreciate, is that of making exceedingly accurate laboratory tests on much of the Radio apparatus now available and, where necessary, advising manufacturers how to improve their products. The determining of losses, inductance and capacity are as routine with Professor Moreton as eating is to most of us, and, best of all, he has the knack of writing about the subject in terms that the veriest newcomer can follow.

His first articles will explain our present theories as to how Radio waves travel and why we have to use certain pieces of apparatus to receive them. Later articles take up circuits and, in detail, the various methods there are of securing desirable results.

This series, which amounts to a complete course in Radio, is to begin in the next issue.

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Looking Ahead

Professor David Penn Moreton, Famous Scientific Authority, will begin a series of articles on Radio in the next issue of Radio Digest. Representing as they do the best information possible on the subject closest to the hearts of most readers, these articles should not be missed. Reserve your copy at the newsstand, or, to be sure of one, subscribe!

The World's Greatest Radio Announcer for 1925 will soon be picked by Radio-phans. Read the details of Radio Digest's second annual Gold Cup Award. Full details will be given next week. George Dewey Hay of WLS was 1924 champion. Who will the winner be this year?

The Four Filter Super Reaches the Panel Assembly and wiring next week. There will also be a variation in circuit for those located far from stations and using dry cell tubes. Mr. Fournier is a believer in clear, faithful reproduction over moderate distances of 700 to 1,000 miles rather than distorted, wavering reception of 2,000 to 3,000 miles.

Broadcast Listener's Library Includes Antennas as the eighth chapter. Mr. Jones regards the proper antenna as very important to satisfactory reception and covers length, type and shape in such a way that readers may put up that which best fits the conditions of each installation.

Newsstands Don't Always Have One Left

WHEN YOU WANT

Radio Digest

YOU WANT IT!

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

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EARTHQUAKE FAILS TO STOP PROGRAMS

CHIC MICROPHONE ROCKS BUT MUSIC GOES ON

CKAC'S Operator Shocked by Equipment—Jacques Cartier Broadcasts Call for Doctor

TORONTO, Canada.—Though an earthquake was shaking the studios of several Canadian broadcasters severely, the spirit of present-day Radio was well able to save the day recently, when at 9:22 p. m. Eastern time a heavy tremor rocked the northeastern section of the United States and Canada.

At CHIC, the station of the Northern Electric company at Toronto, the orchestra was just finishing a dance selection when things began to happen. The microphone on its tall stand showed signs of trying to keep time with the music.

Rudolph Weiss, CHIC director-announcer, realized immediately what had happened. One of the saxophone players started to lay down his instrument. "Bud" stepped to his side and whispered: "Remember the Titanic." The saxophonist picked up his instrument, the other players took an extra brace on their chairs and the orchestra music continued.

CKAC Operator Shocked

In Montreal at Station CKAC, La Presse, Jacques Cartier also realized what was happening, and stopped the microphone and informed the world that they were in the midst of an earthquake and that if they all lived through it they would be back on the air with their program immediately, but that they had to shut off then.

However, things did not work out so well at CKAC, as the station engineer received a very severe shock from the antenna switch when he went to cut the carrier off the air before shutting down the generator. A few moments later, however, Mr. Cartier put the set on the air himself and called a doctor by Radio as owing to the big demand on the telephone system he could not get central.

WJY-Z Announcers Now Use Full Names

R. C. A. Drops Old System of Using Key Letters

NEW YORK.—Listeners to Stations WJZ and WJY, Radio Corporation of America here, have not recently heard the familiar "AON announcing," or "AJN," "ALN" or "ATN," as the case may be. For the first time since WJZ opened the announcers are identifying themselves by their own names.

The change in policy, which took effect on the first of March, is the result of the increased attention to the art of announcing exercised by WJZ and WJY. From now on, a good announcer will win public approval under his own name, and a poor announcer will receive public condemnation as himself rather than as a group of three letters. "AJN" has become "Herbert J. Cross," "ALN" is now "Loris Reid," "AON" addresses the Radio audience as "Norman E. Brokenhairs," "ATN" is "Herbert H. Glover."

The history of the famous "A-N" announcing family is an interesting one. To avoid any misapprehension by the audience that the announcer was a performer, when WJZ first opened in Newark, the use of initials was decided upon. The "A" stood for "Announcer," the middle and distinguished initial was the key letter of each announcer, and the "N" stood for "Newark," and later "New York."

Station Changes

WRAV has a new home—at least the studio is in a new location. Henceforth, all programs except those by remote control will be staged on the twelfth floor of the Deshler hotel, which stands on the busiest corner of downtown Columbia.

Reports reaching Station CKY (CNDW) indicate that the new wave length of 384.4 meters is carrying much better with less interference than did the old wave length of 450 meters.

Two new high power stations are scheduled for California in the near future. One will be located in Los Angeles, the other at Pasadena.

Eight new class A stations have been licensed recently. They are as follows: KFBE, San Luis Obispo, Calif.; KPWA, Ogden, Utah; KCOM, Missoula, Montana; WBBF, Rock Island, Ill.; WIEBG, Harrisburg, Pa.; WBBH, Culver, Indiana; WHHI, Chesaning, Mich., and WJHE, Webster, Mass.

GREATEST ANNOUNCER AGAIN TO BE PICKED BY LISTENERS

Fans Seeking to Determine Who Will Win Coveted Honors for 1925—Full Details to be Given in These Columns Next Week

Radio listeners again clamor to know who is the world's most popular Radio announcer. Who will the invisible audience select this year to bear the coveted title and receive the solid gold cup in Radio Digest's second annual Gold Cup Award?

Last year, after several months of the most intense competition and enthusiastic balloting, George Dewey Hay, the "Solemn Old Judge" and announcer for Station WLS, Chicago, became known as the champion. Hundreds of thousands of broadcast listeners voted their choice. More than one million ballots were received at the offices of Radio Digest.

Now the invisible audience is again asking who will be the announcer king for 1925.

Gold Cup Award Is Annual

And to gratify the wishes of the great invisible army of listeners in, Radio Digest will again undertake to aid them in making their selection.

As was announced last year, the Gold Cup Award is to be an annual Radio Digest feature—as long as broadcasting stations continue to exist. Each year a solid gold trophy will be awarded to the world's champion Radio announcer.

In this connection it is interesting to note that a scientific committee in New York is endeavoring to learn what qualifications enter into the makeup of the perfect announcer. The specifications have all been decided, with the exception of the most important factor, "personality." The committee admits that while the perfect announcer can be defined almost to the last detail, the personality factor is one that cannot be described.

Popular Vote Best Judge

Radiophans can tell what announcers they like or dislike. They need not go into a study of scientific characteristics to make such a decision.

The popular vote will decide.

Watch Radio Digest for further announcements concerning the contest and how it will be decided this year. Full details will be given next week.

In the meantime members of the invisible audience are advised to listen carefully to the various styles of announcing

they hear nightly. What kind is the best? Who pleases the most? Do mother and father agree on their favorite, and have the children ideas of their own?

Noted Engineer Talks to Fellows on Varied Subjects

CLEVELAND, Ohio.—Speaking before a large audience of electrical engineers here, Dr. E. F. W. Alexanderson, noted authority on Radio, told of a system of short Radio waves projecting high into the air which are not heard again until they begin to descend to the earth.

He also described the scrambling and unscrambling of Radio signals.

Fort Worth Announcer Hero in Hotel Blaze

Crazy Wells Hotel Is Totally Destroyed by Fire

MINERAL WELLS, Texas.—The Crazy Wells hotel, one of the best known in the state, was recently destroyed by fire early in the morning. That there was no loss of life and no persons injured was due partly to the fact that WBAP, the Star-Telegram station, broadcast by remote control in the hotel lobby up to a half hour before.

Persons listening to the orchestra lingered in the lobby and when the fire was discovered in the drug store late retirers were used as messengers to rush throughout the hotel awakening occupants. Had the orchestra not been playing the lobby would have been practically deserted.

C. B. Locke, popular announcer of WBAP, proved himself hero of the hour in assisting persons from the flaming building to safety. Before the embers had cooled, decision was made by the management to rebuild the hotel.

The weekly Midnight frolic by Eddie Kerner's Crazy Hotel orchestra is now broadcasting from the Dameron hotel, Mineral Wells.

10,000 WORDS EVERY HOUR WITH MACHINE

PARIS, France.—By the use of a new machine, invented by M. Verdun here, and details of which are being kept secret, it is claimed that 10,000 words an hour can be transmitted and received by Radio. The apparatus is connected to the Baudot machine, now used for telegraphy.



ANNOUNCERS START NEW ORGANIZATION

"MERRY OLD CHIEF" HEAD OF ASSOCIATION

Name Is "Central Time Announcers' Club"—Body Has Seven Charter Members

KANSAS CITY, Mo.—Leo Fitzpatrick, the "Merry Old Chief" of WDAF, the Kansas City Star station, recently was unanimously elected to head the Central Time Announcers' club, an organization formed at a meeting of announcers at the Kansas City Athletic club in connection with the Radio show held in this city.

The club was formed with seven charter members, representing broadcasting stations of Chicago, Omaha, Kansas City, Fort Worth and Atlanta.

Charter members besides Mr. Fitzpatrick were George Hay of WLS, Chicago, Sears Roebuck & Co., Gebe Rouse of WOAW, Woodmen of the World, Omaha; Lambdin Kay of WSB, Atlanta Journal; W. G. "Bill" Hay of KFCK, Hastings, Nebr.; Westinghouse station; Harold Hough of WBAP, Fort Worth Star-Telegram, and John Schilling of WHB, the Sweeney Automotive and Electrical school, Kansas City.

The purpose of the organization will be to sponsor a movement for a more hearty co-operation among announcers.

Prince Albert, Sask., Hears Five U. S. Stations Best

PRINCE ALBERT, Sask. — Programs from broadcasting stations to the south of here are more easily received than those from the east, according to officials of the Prince Albert Radio club.

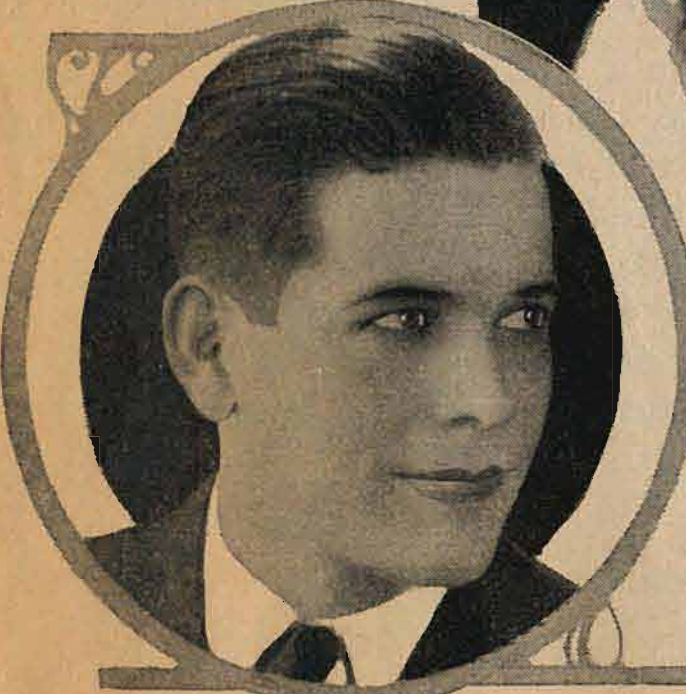
Five stations selected by them as being the easiest to pick up and which give the best results there, are: WCCO, Minneapolis; KOA, Denver; WEBB, Chicago; WOC, Davenport, Iowa, and WDAF, Kansas City.

Club Plans Trouble Shooter

BARTLESVILLE, Okla. — The Radio club here has built a trouble shooting set and plans to provide funds to pay the salary of a man to hunt down sources of Radio interference.



Mr. Lindsay Coons, Station WTAS, Elgin, Ill., ballad singer, heard recently from Station WOC, Davenport, is shown on the left. Mr. Coons, who hails from Des Moines, has been a prominent entertainer at the Mississippi Valley fairs for several years. Above, Constance Talmadge, who was hostess at a recent Hollywood night at Station KXX. Right, Benjamin Gigli, famous opera star, made his Radio debut in the form of an interview with Terese Rose, recently from WGES. He spoke in Italian, and it was interpreted on the air, so that both nationalities could understand.



"Spring Time Week" Is WLW Innovation

Attractive Program Starts March 22 at Crosley Studios

CINCINNATI.—The week of March 22 will be "Spring Time Week" at Crosley WLW, Cincinnati. Every program will feature one of the famous melodies of spring time, such as Mendelssohn's "Spring Song," Grieg's "To Spring," "Message of the Violets," and many other selections of the ever popular spring time flavor.

The peak of the week's entertainment will be reached on Wednesday night, March 25, when the Shrine band, directed by Henry Fillmore, comes to WLW with

a magnificent organization, composed of a brass band; the famous trio—Eddie Ball, Howard Hafford and Billy Waterworth; monologues by Mum Platt; special stunts by Doc Betzner; Bob Alter and his wood saw; trumpet solos by August Schaefer; George Carr, clarinet; humorous duets on the clarinet by Jake Bohrer and Edwin Schath; and compositions of one of the members of the band, John Klohr, internationally-known composer.

Jenkins Promises Radio Movies

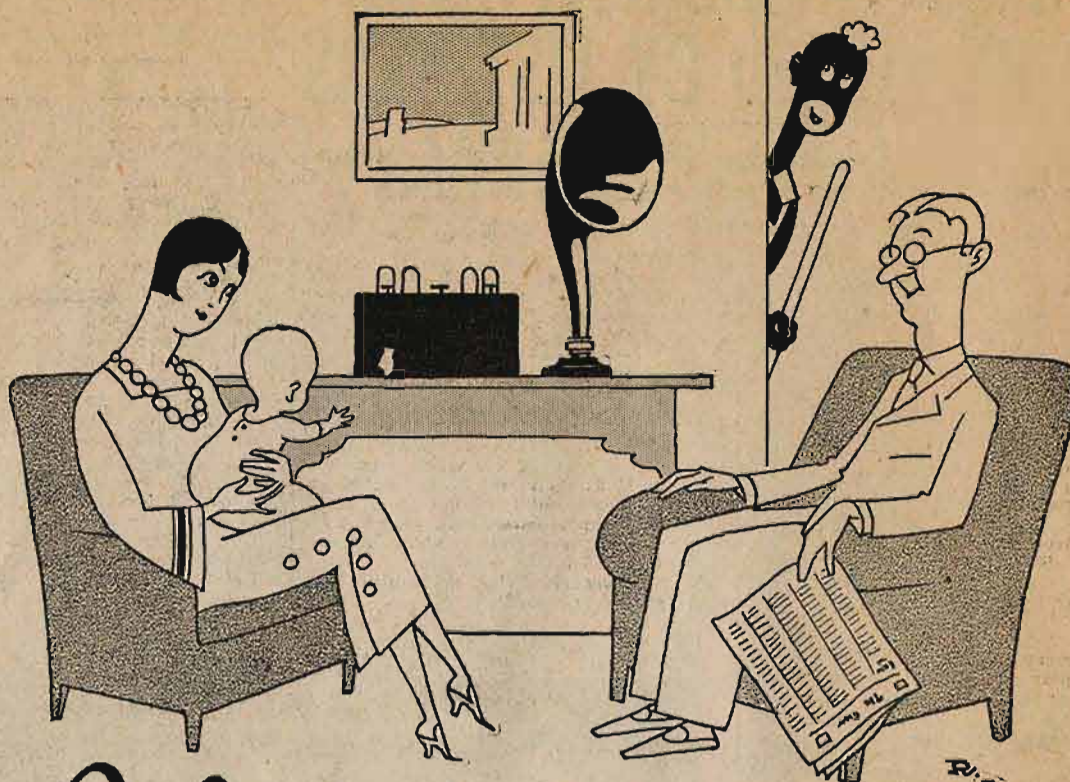
WASHINGTON, D. C.—C. Francis Jenkins, one of the most prominent Radio inventors of Washington, stated in a recent address before the Washington Society of Engineers that he expects to send motion pictures by Radio within the next few weeks.

SILOAM ORCHESTRA IS KFJF'S LATEST TREAT

Mayor of Oklahoma City Is Friday Night Announcer

OKLAHOMA CITY, Okla.—KFJF, the station of the National Radio Mfg. company here, announces a new treat for its listeners. The Siloam Philharmonic orchestra has been engaged to play a series of one and one-half hour concerts, starting at 8:30 Central time, each Monday.

Another popular and regular feature of the Oklahoma City station is the 7:30 to 9:30 p. m. Friday night program, conducted from the municipal building and announced by the mayor of the city.



Where the fun comes in

Listening to real music—listening to clear, undistorted voice—getting what you want when you want it. That's where the fun comes in, in radio.

The tubes cannot do the whole job. But other good parts are of little avail without the *best tubes*. Everybody knows this, and most people do ask for RADIOTRONS by name, and watch to see that they get what they ask for. For the very best reception your set can give—no matter what type of tube you need—look for the Radiotron name, and the RCA mark.



UV-199
WD-11
WD-12
UV-200
UV-201-a

Radiotrons with these model numbers are only genuine when they bear the name Radiotron and the RCA mark.



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10 SO. LA SALLE ST
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Radiotron

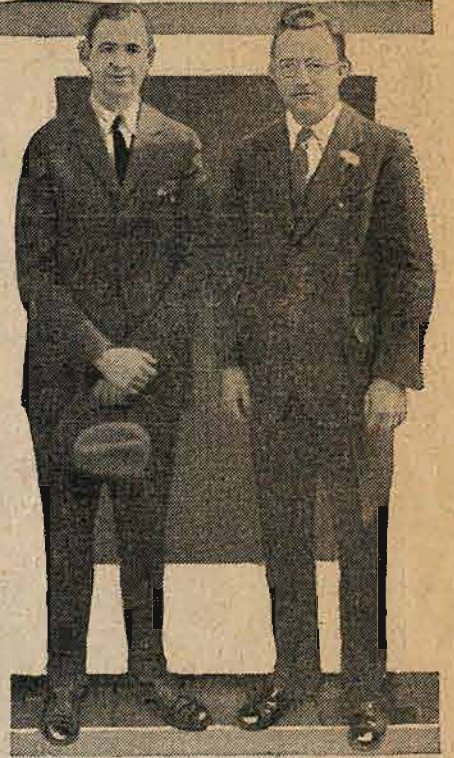
REG. U. S. PAT. OFF.

WEEI, "Big Brother" Emery's Own Station

WHAT could be sweeter than music coming from a sugar-coated studio? Radiophans should hear nothing but sweet music from WEEI, the new Edison Light station, for the walls and ceiling of the studio are covered with dried, pressed sugar cane. Acoustic engineers have discovered that sugar cane is the best sound deadening material to be had. Hence the sweetness at WEEI, Boston, Mass.

One of the novel features at Station WEEI is the nightly meetings of the Boston Edison Big Brothers' club, an outgrowth of the Amrad Big Brothers' club, which Bob Emery founded while he was connected with WGI at Medford Hillside. Emery, who is perhaps better known as "Big Brother," is the program director at WEEI. To join the club, each child must write a letter to Big Brother. The dues are one letter a week to Big Brother. The members are given a signed membership card and a Big Brother club pin. Between 7 and 7:30 each evening there is broadcast a special program for the club members.

Bob Emery is a very versatile young man, and can play practically any musical instrument that has ever been made. He is



Left, here they are all together. Back row: P. W. Pratt, Ralph Mathewson and C. V. Pursell; middle row, E. Lewis Dunham, Lewis Whitcomb, C. W. Burton, "Bob" Emery and Leon Kentz; front row, Dorothy Blackwell and Marjorie Drew. Above, Lewis S. Whitcomb (left), assistant superintendent, and G. W. Burton, superintendent of WEEI.

especially adept at playing the Miami tiple. A tiple is like an overgrown "uke," except for the fact that it has ten strings instead of the usual five.

Direction of this station is in the hands of two former Radio editors. Charles Burton, superintendent of broadcasting, was Radio editor of the Boston Herald-Traveler. Lewis Whitcomb, assistant superintendent, was Radio news editor of the Boston Post.

Another new idea developed at WEEI is the Radio interview. Since this form of entertainment has been introduced, many business men, stage celebrities, federal, state and civil personages, have been interviewed before the microphone by "Whit," who is known in real life as Lewis S. Whitcomb. So great has been the demand for this feature that another newspaper man, "Hap" Myers, has been added to the staff at the Edison station.

The main studio is located on the fourth floor at 39 Boylston street, while the shack or operating room is on the roof of the same building. No expense or labor has been spared to make the model operating shack absolutely free from any mechanical noise or hum which mar the programs from some stations.

In the first place, the shack itself is completely shielded on the outside with layers of one-quarter inch copper sheathing. This is the only operating room in the country, so far as is known, to be so constructed. The action of the copper shielding eliminates the possibility of Radio frequency get-

ting through the walls of the shack into the operating room and causing interference with the performance of the transmitter. Beneath this copper covering is a foot-thick wall of brick and cement.

There are three distinct compartments inside. The first is an acoustically treated emergency studio. WEEI is the only station hereabouts with an auxiliary studio adjoin-

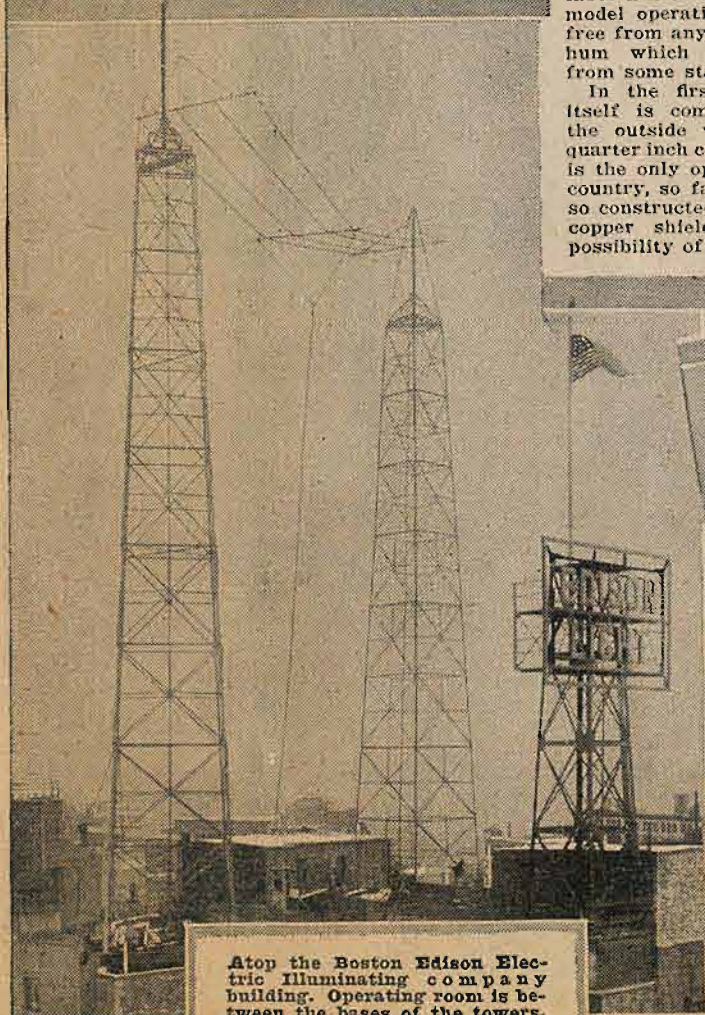
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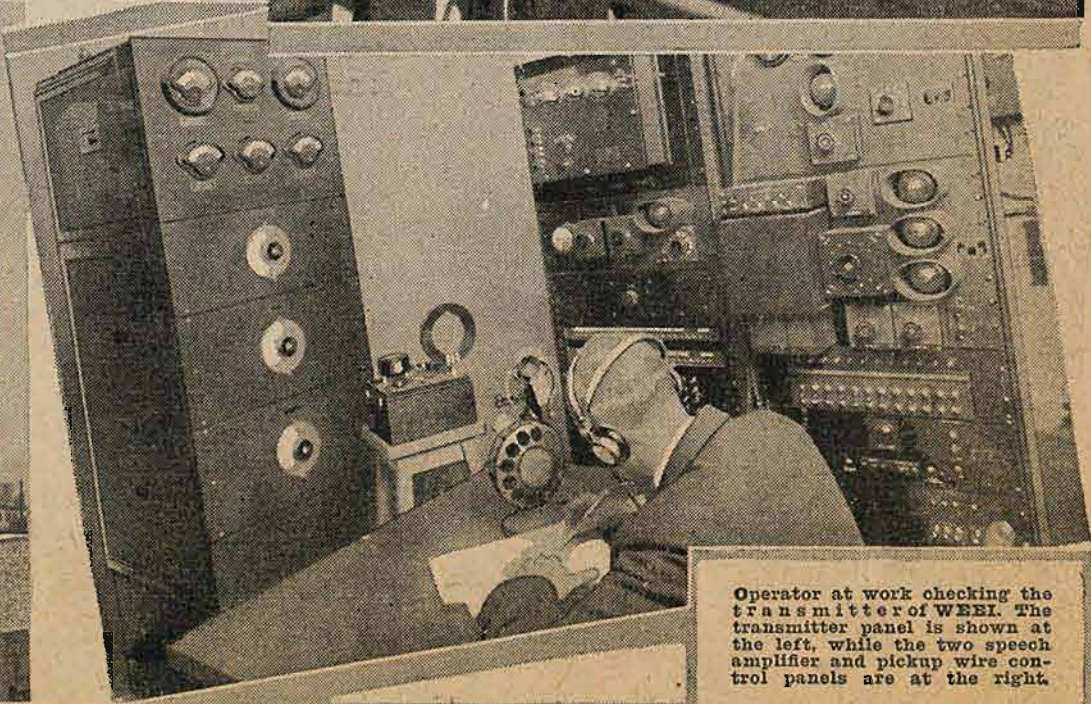
"Bob" Emery, better known to the fans as "Big Brother," about to amuse members of Big Brother club.



Portable Station WTAT, a 100-watt transmitter in a light delivery truck. It recently acquired the title of "The Only Seagoing Broadcast Station." It is here shown lashed on the revenue cutter at the time it earned its name.



Atop the Boston Edison Electric Illuminating company building. Operating room is between the bases of the towers.



Operator at work checking the transmitter of WEEI. The transmitter panel is shown at the left, while the two speech amplifier and pickup wire control panels are at the right.

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STATION GLEANINGS AND NEWSY BRIEFS

FORT GARRY TRIO AT CNRW MAKE MANY FRIENDS

CFCF Have Star Performer, Miss Ruth Brotman, Who Sings in Nine Foreign Languages

The Fort Garry trio have again given the fans a treat from Station CNRW (CKY), Winnipeg, Can. The class of music provided and the manner in which the numbers were played, has drawn hundreds of applause letters.

Station CFCF, Montreal, Can., recently had a versatile young lady singing from that station. She is Miss Ruth Brotman, and as part of her repertoire, she sang songs in Norwegian, Latin, English, Jewish, Italian, German, Russian, Spanish and French. Rarely have fans the privilege of listening to the rendition of a song in as many languages, as at this time.

Wanda Menning Snyder, harpist, will be featured throughout the month of March in the afternoon programs from WGR, Buffalo, N. Y.

Joe Novak, professional golf instructor, will give lessons to embryo golfers from Station KGO, Oakland, Calif., every week. Charts showing the eight fundamental positions of the body and club will be sent to listeners on request.

"Pierre of the Plains," a wild and woolly story of the Canadian Northwest, will be broadcast by KGO, Oakland, Calif., Thursday evening, March 26. Wilda Wilson Church will direct ten players in the cast.

Playlets will be broadcast from Station WCCO, Minneapolis, every Wednesday afternoon at 4 o'clock. Arrangements have been made to have sketches given by various companies of Minneapolis and St. Paul players.

Harry Snodgrass, better known as "King of the Ivories," is now playing in "big time" vaudeville with the former announcer at WOS, J. M. Witten. During their engagement—which will last for two years—the "King" will be unable to play over the Radio.

According to statistics, Station WGY, Schenectady, N. Y., leads broadcast stations by being on the air 1630 hours during 1924. Station WOC, Davenport, Iowa, is second, with 1609 hours to their credit.

At a cost running into hundreds of dollars, Station WOAW, Omaha, Nebr., recently broadcast an unusual program from North Platte, Nebr. This cost was for the installation of a complete pickup system for only one program.

Mikail Lambert, far-famed concert cellist of the Symphony Society of New York, will appear every Friday night at Station WAHG, Richmond Hill, N. Y. Another star who appears with regularity at this station is Madelyn Marshall Simon, pianist. She was formerly accompanist for Leopold Auer, world-famous violin teacher. Her non-de-milke at the Grebe studio is Maud Mason.

When the Victor company promised programs ranging from grand opera to jazz, fans listened in with a smile. Now that they have broadcast grand opera, jazz gets its turn. On March 12, fans throughout the country heard the first Victor jazz program, which brought the usual deluge of mail to the Victor company.

In honor of the Fanny Crosby Memorial campaign being conducted in New York city, Station WEMC, Berrien Springs, Mich., will broadcast a special program Sunday evening, March 22.

At the conclusion of a program recently, Station KENF, Shenandoah, Iowa, surprised the fans and broadcast a wedding which had not been scheduled for that evening. Thousands of letters and telegrams poured into the studio congratulating the new couple.

The Southwest Exposition and Fat Stock show was broadcast from Station WBAP, Fort Worth, Texas. A microphone was installed in the arena so that the results could be broadcast direct. The Texas A. and M. Military band rendered selections during the afternoon.

Station WJAG, Norfolk, Nebr., has inaugurated a new feature. It has requested the superintendents of all the hospitals to inform the station the condition of the out-of-town patients who desire to have their condition broadcast to their friends. It met with instantaneous success.

STATIONS IN ORDER OF WAVE LENGTHS USED

Meters	Call	Meters	Call	Meters	Call	Meters	Call	Meters	Call	Meters	Call
228	WBBM	275	WHAD	315.6	WAHG	361.2	WHN	405.2	WOR	468.5	WCAP
233	WBBJ	275	WORD	315.6	WGBS	365.6	WDAF	406	WBAR	468.5	WRC
240	KFAB	275.3	WJAS	319	WGR	365.6	WHB	416.4	WCCO	475.9	WBAP
240	WOAX	278	WCAU	322.4	KOA	370	CYB	420.3	KPO	475.9	WEEI
244	WABN	278	WLBL	325.9	WSAI	370.2	WEBB	421	KIAF	475.9	WFAA
248	WBBG	278	WRBC	330	CYX	370.2	WGN	422.3	WLV	480	CYL
250	WTAY	280.2	WNAC	333.3	WBZ	374.8	KTHS	422.3	WMB	483.6	WOC
261	KPPT	285.5	WKAR	336.9	KFMX	379.5	WGY	428.3	WSB	483.6	WSUI
265.5	WMAK	285.5	WREO	336.9	KNX	379.5	WHAZ	434.5	CKAC	491.5	KGW
266	KFNF	285.5	WEMC	336.9	WCAL	384.4	CKY	434.5	CNRO	491.5	WEAF
266	WBCN	288.3	KFKX	336.9	WSAC	384.4	KFOA	434.5	NAA	499.7	WMC
268	WEBW	293.9	KJS	340.7	KSAC	384.4	KJR	434.5	AT9	508.2	KLX
270	WGST	293.9	WBAV	340.7	WKAQ	384.4	WMBF	435	CFCN	508.2	WIP
270	WOI	293.9	WEAO	344.6	WCBD	389.4	WEAR	440	WDWF	516.9	WOO
272.6	WBBR	296.9	KFRU	344.6	WLS	389.4	WTAM	440.9	WOS	526	WHO
272.6	WFBH	299.8	KFMQ	348.6	KFAB	394.5	WLIT	440.9	WMAQ	526	WOAW
273	KFKB	299.8	WPG	348.6	KOB	394.5	WFI	447.5	WQJ	526	WNYC
273	WHK	302.8	WJJD	348.6	WTIC	394.5	WOAI	447.5	WJZ	525.4	WHA
273	WRW	302.8	WTAS	352.7	WWJ	399.8	WHAS	454.3	KTW	535.4	KYW
275	KFAU	305.9	WJAR	356.9	CFCA	400	PWX	455	WCAE	545.1	KFUO
275	KFKU	309.1	KDKA	356.9	CHNC	405.2	KHJ	461.3	KFI	545.1	KSD
275	WABL	315.6	KFDM	361.2	KGO	405.2	WJY	468.5			

Reunites Old Friends

COLUMBUS, Ohio.—C. A. Entekin, local electrical dealer, was reunited to a pal of his boyhood days, 22 years ago,

when his applause note was read over WEAO here recently. Wm. D. Fryback, at La Junta, Col., heard Mr. Entekin's name and wrote his former chum.

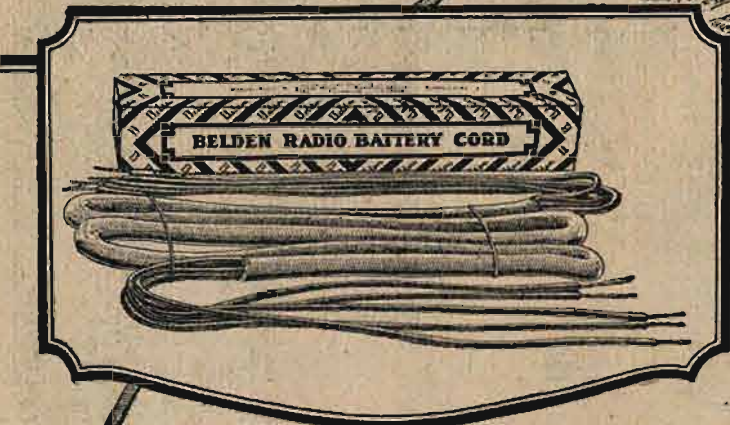
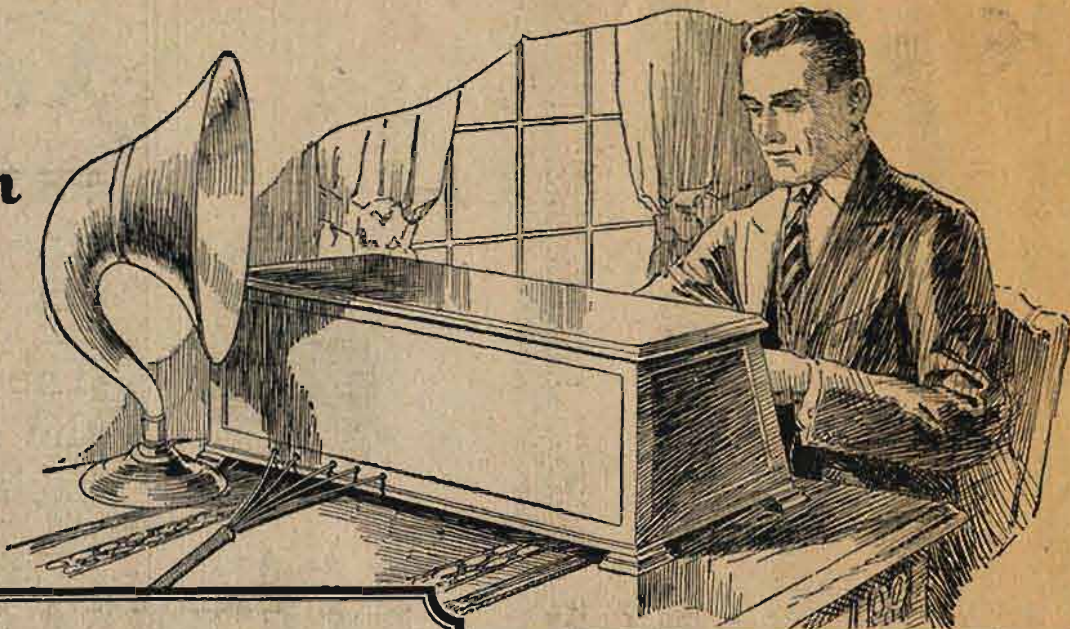
INKLING CREATOR AT WIP WITH CARTOONS



MAX Fleischer, the creator of the "Out-of-the-Inkwell" comedy films, which are known all over the country, recently visited Station WIP, in Philadelphia. He was programmed as part of Uncle Wip's half hour, and he made a tremendous hit with the listeners in, telling them all how he made the clown and other characters come out of the inkwell, and disappear into the said inkwell when he was finished with them.

When Mr. Fleischer completed his talk he made little sketches of the clown for several persons in the personnel of the station. Here is one of them.

Specify Belden



Make Your Set Safe for Tubes and Batteries

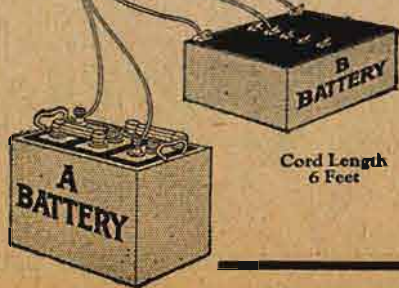
Just one accidental short circuit among the battery wires, that lead to your set, can burn out all the tubes or ruin the batteries. That is why the experienced radio fan does not trust to a mess of connecting wires, between the set and the batteries, but uses a sturdy, neat battery cord in their place.

Loose connections and poor joints are responsible for much noise in the receiver, and a good battery cord eliminates much of this trouble. The circuits are easily traced and B-battery taps can be changed without danger of wrong connections. Try a Belden Radio Battery Cord before you burn out your tubes. It is inexpensive insurance against trouble. Get one, today!

Improves Appearance of Set

The Belden Radio Battery Cord contains five flexible, rubber-covered conductors, each marked plainly with a colored tracer. Two conductors are No. 16, for the A-battery circuit, and three are No. 18 for the B-battery circuit. All conductors are enclosed in a glazed brown braid that resists wear and protects the conductors. The ends are soldered, and can be used with any type of terminal. Does away with all messy, dangerous battery wiring.

Free Booklet
Send for it
Now!



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Please send me "Helpful Hints for Radio Fans," describing all Belden Radio Products.

Name _____
Address _____

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

Table with columns for Station and City, Met., Saturday, Sunday, Monday, Tuesday, Wednesday, Thursday, Friday. Lists various radio stations and their broadcast schedules.

Instructions for Use—All the hours above are given in Central Standard Time. If your city uses Eastern Time, add one hour to each of the periods stated; if your city uses Mountain Time, subtract one hour; if your city uses Pacific Time, subtract two hours. This table includes only evening and, on Sunday, late afternoon programs.

WEEI AT BOSTON

(Continued from page 5)

ing the operating room. The walls of this studio, like the walls of the main studio on the roof, are devoid of any hangings or drapes and are lined with a sound absorbing material made from dried, pressed sugar cane.

The transmitting equipment is of 500 watts output. The aerial equipment is composed of two 125-foot towers on the roof of the Edison building. The stretch between these towers is sixty feet and the aerial is of the four-wire T type. Between the two towers, the transmitting apparatus is housed.

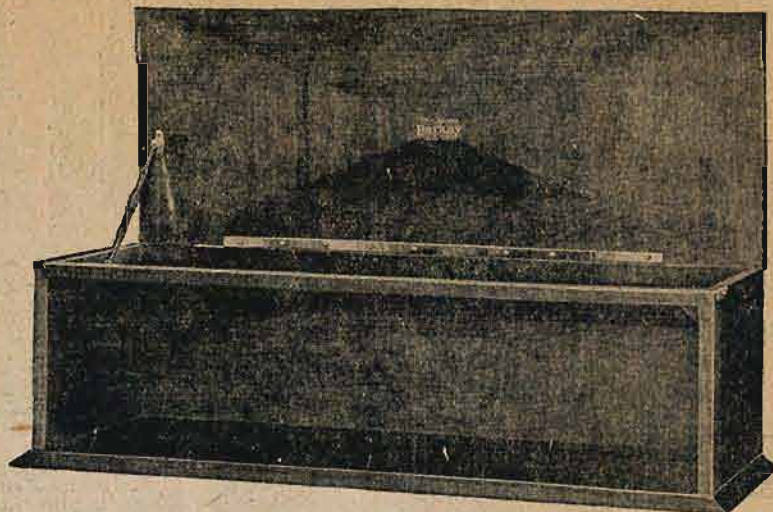
WTAT, the 100-watt original Edison station, is still on the air. This is a portable station installed on a motor

speed wagon and used for special broadcasts out of the city.

The little brother of WEEI recently acquired the title of "The Only Seagoing Broadcasting Station" when it was lashed to the deck of a ship and taken 100 miles out into the ocean for experimental broadcasting during the solar eclipse.

A direct line running to the studio of WEAF, is perhaps the greatest program feature. Regular programs broadcast from WEAF are transmitted from WEEI on Tuesday, Thursday, Friday and Saturday evenings.

Government license, regulations and inspection are required for all receiving and sending stations in Mexico. It is estimated that there are 20,000 receiving sets in Mexico City and 12,000 more in other parts of the country.



Good Looks

are, with most of your friends, the standard by which they judge your Radio set.

The Jewett Parkay is positively the handsomest and best built cabinet you have ever seen. Your set deserves it.



Built of the finest American mahogany—All standard sizes, from 7 x 9 x 18 to 8 x 8 x 40—Top of genuine parquetry—Nickel hardware throughout—A real cabinet worker job from our own factory in Western Michigan's world famous woodworking district—Special scratch-resisting finish. At all Jewett dealers.

JEWETT RADIO & PHONOGRAPH CO. 5680 TWELFTH ST. DETROIT, MICH.

"THERE IS NO SUBSTITUTE FOR THE BEST"

The Jewett Parkay RADIO CABINET

FLORENCE GALAJIKIAN PLAYS AT WGN

Saturday, March 21

Eastern Time Stations

The following schedules of programs are given in Eastern time. To change to Central time, subtract one hour; Mountain time, subtract two hours; Pacific time, subtract three hours.

Saturday, silent night for: AT9, CHNC, CHIC, CKY, KFAB, KFAE, KFKU, KFKX, KFMQ, KFMX, KFUD, KLX, KOB, KSAC, WBAP, WBAV, WCAU, WCBP, WDFW, WEAO, WEAR, WEBJ, WEBW, WEEI, WGST, WHAD, WHAZ, WHB, WHO, WJY, WKAQ, WOAI, WOI, WOO, WOS, WSAC, WSUI.

Eastern Time Stations

CFCA, Toronto, Can. (356), 11 p. m., dance program, National Yacht club symphonic orchestra, F. C. Beresford, director.
CKAC, Montreal, Can. (410.7), 7:30 p. m., Harry Salter's trio; 8:30, variety program; 10:30, Harold Leonard's Red Jackets.
CNRO, Ottawa, Can. (434.5), 8 p. m., James McIntyre and his Chateau Laurier concert orchestra; 8:30, Lila Somerville, soprano; B. Williams, pianist; M. I. McGlade, vocalist; "Dinosaurs, the Real Giants of the Past," C. M. Sternberg; mouth organ contest, accordion and concertino contests; James McIntyre and his Chateau Laurier dance orchestra; Jack Grace.
KDKA, Pittsburgh, Pa. (309.1), 6 p. m., dinner concert, Westinghouse band; 7:30, Wimple, the Wanderer; 8, Pittsburgh Sun Radio Sphinx club, Richard the Riddler, director; 8:15, "Florida from the Inside," F. L. Wood; 8:30, Westinghouse band, T. J. Vastine, director.
PWX, Havana, Cuba (400), 8:30 p. m., Fausto Alvarez, tenor; Julie P. Villette.
WAMG, Richmond Hill, N. Y. (315.6), 12-2 a. m., special program, Glen C. Smith's Paramount orchestra.
WBAV, Columbus, Ohio (293.9), 8-10 p. m., WBAV orchestra.
WBBR, New York, N. Y. (272.6), 8 p. m., Frank Wood.

Central Time Stations

The following schedules of programs are given in Central time. To change to Eastern time, add one hour; Mountain time, subtract one hour; Pacific time, subtract two hours.

KFNF, Shenandoah, Ia. (266), 6:30 p. m., concert, Omaha Scottish trio; 8:30, old time music, Statesman Brothers.

KSD, St. Louis, Mo. (545.1), 7 p. m., musical program, Grand Central theater; 9, music specialties, Missouri theater.
KTHS, Hot Springs National Park, Ark. (374.8), 8:30-9:45 p. m., Charles L. Fischer orchestra; 9:45-10:45, Meyer Davis-New Arlington hotel orchestra, Jacques Renard, director.
KYW, Chicago, Ill. (535.4), 7-7:30 p. m., dinner concert, Congress hotel; 8-8:58, Lucille Comfert, Oren, soprano; William Benson, tenor; Joel Lay, baritone; Thomas B. Stephenson; 9:05, health talk, Dr. John M. Dodson; 9:35-11:30, Congress classic; 12-1, Congress carnival; 1-2, Insomnia club.
WBCN, Chicago, Ill. (266), 6-6:45 p. m., Harold's orchestra; 7-8, fireside hour, George R. Cleveland; Dr. S. Wall, saxophonist; Southtown harmonizers; Lucas sisters; 8-12, Jack Parker, Cameo Record tenor; George Forsyth, boy tenor; Midway Gardens orchestra; George R. Cleveland, reader; Walter Felt, Harry Beterwaltes, pianists; adoption of white man by full-blooded chiefs of six Indian tribes; I. P. Delaney, tenor; Elizabeth Emmett Malone, soprano; L. V. Skow, tenor; Lucille O'Hara, soprano; Belma Tyler, soprano; Murphy sisters; Les Cameron, tenor; Marie Wright, soprano; 12-1 a. m., Owl matinee, Bobby Allen, tenor; Felt and Beterwaltes, pianist; Les Cameron, Jack Park, Cameo Record tenors; Big Boy Yagle, pianist.
WCAL, Northfield, Minn. (236.9), 12 midnight, musicale.
WCCO, Minneapolis-St. Paul, Minn. (416.4), 2:30 p. m., Northern States Power program; 6, Minneapolis Athletic Club orchestra; 9, "Firelike Philosophies," Rev. Roy L. Smith; 8:30, minstrel show, L. O. O. T.; 10, St. Paul Athletic Club orchestra; Gold Medal Radio quartet.
WCEE, Elgin, Ill. (275), 7-8 p. m., Boss' Own orchestra; Eddie Loftus; 11-12, Boss' Own orchestra.
WDAF, Kansas City, Mo. (365.6), 3:30-4:30 p. m., Star's Radio orchestra; 6-7, piano tuning-in number on the Duo-Art; Camp Fire Girls' program; the Tell-Me-a-Story lady; Trio ensemble; 11:45-1, Merry Old Chief and the Plantation players; Eddie Kuhn's Kansas City Athletic Club orchestra.
WEBB, Chicago, Ill. (370.2), 7-8 p. m., Oriole orchestra; Dan Russo and Ted Fiorito; 9-10, Oriole orchestra; Marie Kelly, reader; Eleanor Gilmore, soprano; Pat Barnes, reader; 11-12, Oriole orchestra; Loos brothers; Marie Kelly, reader; Frank Sylvano, Kay Honayne, Banks Kennedy, Ned and Ches; Ralph Snyder.
WFAA, Dallas, Tex. (475.9), 6-7 p. m., Honey Boys' orchestra; 11-12, Adolphus hotel orchestra.
WGN, Chicago, Ill. (370.2), 6 p. m., organ, Lyon & Healy; 6:30-7, drake concert ensemble, Blackstone string quintet; 8-9, Dwight Edward Cook, tenor; Florence Grandland Galajikian, pianist; 10-11, Don Bestor Drake dance orchestra.
WHAS, Louisville, Ky. (399.8), 4-5 p. m., Louisville Conservatory of Music; 7:30-9, Ray Stark's Triangle Garden orchestra; four-minute talk, Mrs. Frances Carre; Katherine Hamman, reader.
WBL, Stevens Point, Wis. (278), 12 midnight, Ensembles of Sleep.

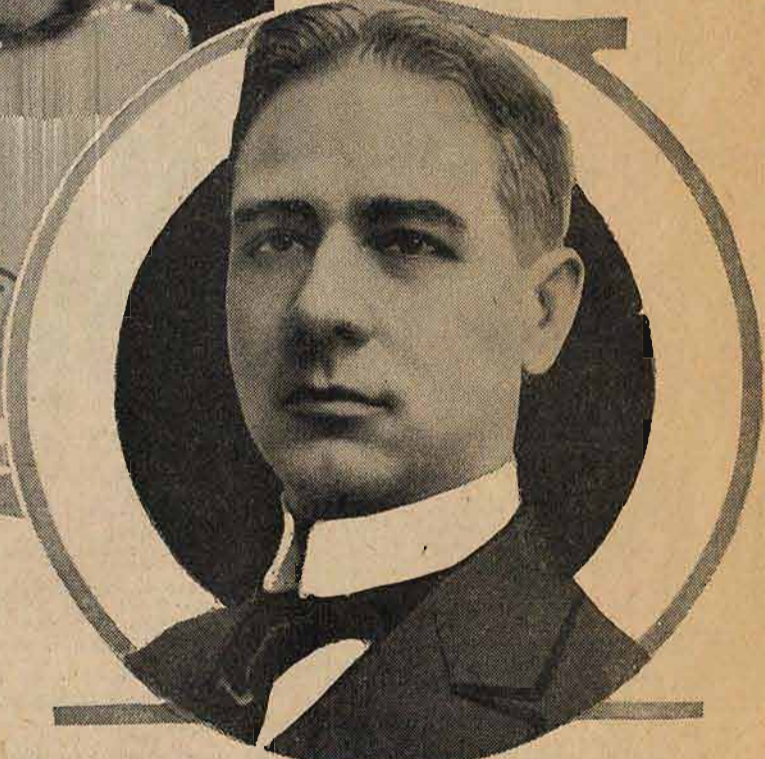
(Continued on page 10)



Eddie Harkness (above) and his orchestra play the gay tunes to which Pacific coast fans trip each night. These are sent out over the ether by KFOA.



Laurette Rietz (above) is a popular vaudiville entertainer of Minneapolis and St. Paul. She often entertains at WCCO, the Gold Medal station. J. W. F. Leman (right) is the conductor of the Women's Symphony orchestra of Philadelphia, which will be heard on March 24 at WFI. Mr. Leman is well known for his concert orchestra, which plays during the summer at Atlantic City.



Headliners of the Week

FLORENCE Grandland Galajikian, a young pianist who has won professional recognition in both New York and Chicago, will appear for the first time Saturday before the microphone of WGN. Dwight E. Cook, tenor, will also take part in the program.

A cantata by Bach, "God's Time Is Best," will be the headliner of the week at KDKA. The cantata class from the music department of the Carnegie Institute of Technology will give this composition Sunday. J. Vick O'Brien will direct the production.

The Monday programs of WMBF, Miami Beach, are enhanced by the addition of the Nautilus Lucky Seven orchestra. This orchestra, together with the Rosebrook's Radio serenaders will make this station more than popular.

Jimmy Clark and his White Way entertainers are back on the air again with many sparkling new song hits and Radio surprises. You may hear these merry invaders of the ether Tuesday at WEBJ, and just so you

may not miss the first number, they begin at 7:15 p. m.

WOC reminds you Wednesday that it is time to plan your vacation for this year. George A. Pickes, general secretary of the Missouri association, will talk on this subject. He will be able to give practical suggestions for long trips.

Many of the stations are so old they prefer to forget their birthdays. Not so with WEMC. This sprightly young station will let the Radio world know about its first anniversary Wednesday with a special program.

Fans have been puzzled lately by hearing talks in a foreign language. CKY can probably explain this easily. Every Thursday, Professor A. C. de la Lande gives a French lecture. These are very interesting for those who understand French. CKY is now using a wave length of 334.4 meters.

Old-time songs played by a group of very young artists will be the Friday program at KOB. Clifford Coble, age 14; Ila Coble, age 13, and Dean Coble, age 11, are the members of this talented instrumental trio.

Artist; 8:10, Mrs. L. M. Brown, soprano; 8:15, Bible questions and answers, Judge J. E. Rutherford; 8:15, Mrs. L. M. Brown, soprano; 8:55, Frank Wood, flutist.
WCAE, Pittsburgh, Pa. (461.3), 2:30 p. m., tea-dansant music, Nixon restaurant; 4:30, Ed. Lally's Rendezvous cabaret orchestra; 6:30, dinner concert, William Penn hotel; 7:30, Uncle Kaybee; 8:30, artists, Charles Le Sager.
WCX, Detroit, Mich. (516.9), 4:15 p. m., musical program; 6, dinner concert, Book-Cadillac hotel.
WEAF, New York, N. Y. (491.5), 6-7 p. m., dinner music from Waldorf-Astoria hotel; 7:20, J. Darwin and William J. Smith, banjoists; 7:20-7:55, Nemo male quartet; 7:55-8, Martin Richardson, tenor; 8-8:20, Vee Lavinhurst, pianist; 8:20-8:55, Harry Hadley Schyde, bass; 9-9:45, Waldorf-Astoria concert orchestra; 10-10:30, Igrie club of New York; 10:30-11, Rudolph Jaskowitz, violinist; 11-12, Vincent Lopez Hotel Pennsylvania orchestra.
WFI, Philadelphia, Pa. (394.5), 6 p. m., Roy Elray and his dance orchestra; 6:30, Meyer Davis' Bellevue Stratford concert orchestra; 8, "Diet in Health," Dr. Clifford B. Farr; plus "The Yallant."
WGBS, New York, N. Y. (315.6), 6-6:30 p. m., Uncle Geebee; 6:30-7:30, Cameo Collegians; 7:30-8:30, Armand Vecsey's orchestra; 9:15-9:20, Fred Schaeffer, zither; 9:45-11, Muspirtie ensemble.
WGR, Buffalo, N. Y. (319), 6-7:30 p. m., Hallpyrd string trio.
WGY, Schenectady, N. Y. (379.5), 9:30 p. m., Phil Romano's orchestra.
WHN, New York, N. Y. (361.2), 9:30-7 p. m., violin solos, Olcott Vail, accompanied by Stephen Balogh; 7:30-7:35, health talk, Dr. Landis; 7:35-8, Hotel Carlton Terrace orchestra; 8:30-9, Strand Roof orchestra; 9-10, Northminster Interdenominational church service; 11:30-12:30 a. m., Roseland dance orchestra.
WIP, Philadelphia, Pa. (568.2), 6:05 p. m., songs,

orchestra; 8-8:10, "Art for Laymen," Walter M. Grant; 8:15-8:30, Charlotte Lund, soprano; 8:45-9, "Revenue Act of 1924," Treasury department, New York; 9:15-10:15, Gene Fostick and his Club Mirador orchestra; 10:30-11:30, Joseph Knecht's Waldorf-Astoria dance orchestra.
WLIT, Philadelphia, Pa. (394.5), 7 p. m., Arcadia cafe concert orchestra.
WMBF, Miami Beach, Fla. (384.4), 10-2 a. m., Nautilus hotel orchestra; Rosebrook's Radio serenaders.
WNYC, New York, N. Y. (526), 6:30-7:30 p. m., Club Alabam orchestra; 7:35-8, Chateau four; 8:30-9, Police quartet; 9-10, concert program; 10:10-10:20, travel talk.
WOO, Philadelphia, Pa. (508.2), 4:45 p. m., organ recital, Mary E. Vogt.
WOR, New York, N. Y. (405.2), 6:15-7:30 p. m., Mabelle Cowan and her string orchestra; 7:30-8, Commanders; 8-8:15, Albert Rappaport, tenor; 8:15-8:45, Helen Oshea, soprano; Joseph M. Barnett, baritone; Florence Wessell, pianist; 8:45-9, Dr. Frank Crane; 9:45, Helen Oshea; Joseph M. Barnett; Florence Wessell; 9:45, Albert Rappaport; 10-11, Radio Congress of U. S.; 11-12, Clo orchestra.
WPG, Atlantic City, N. J. (299.8), 9 p. m., Ambassador hotel concert orchestra; 10, studio recital; 11, Paul Whitman's Hotel Traymore dance orchestra.
WRC, Washington, D. C. (469.5), 6:45 p. m., children's hour, Madge Tucker; 7, Irving Boerstein's Washington hotel orchestra; 8, Bible talk; 9, "The Condenser in Radio Receiving Sets," E. L. Hall; 10, Vincent Lopez and his Hotel Mayflower orchestra.
WTAM, Cleveland, Ohio (389.4), 6-7 p. m., Hotel Statler studio dinner music; 9, Ev Jones and his WTAM dance orchestra; Ruth Davis Fuller, contralto.
WWJ, Detroit, Mich. (352.7), 3 p. m., Detroit News orchestra.

WOC HELPS WITH VACATION PLANS

Saturday, March 21

(Continued from page 9)

WLS, Chicago, Ill. (344.6). 7 p. m., Ford and Glenn's trip to Brazil; 8:30, radio revue night, Glenn's Cornhuskers' orchestra; Ralph Emerson, organist; Harmony girls; Walter Peterson, "The Kentucky Wagoner"; Ford and Glenn; Vincent Rose and his orchestra; 11, Senate theater studio revue.

WLW, Cincinnati, Ohio (423). 3 p. m., dance program; 6, dinner hour concert; 8:15, popular music, Henry Lange and his Hotel Sinton orchestra.

WMAQ, Chicago, Ill. (447.3). 9 p. m., "Daddy" Pratt, Carter Harrison high school; S. Russell Pratt, Fred Day; 8:30, "China," Henry Huezinger; 9, weekly Chicago theater revue.

WOAW, Omaha, Nebr. (526). 5 p. m., Nebraska Wesleyan Glee club; 6, dramatic hour, Davis Studio of Expression; 6:30, music; 7:30, weekly address, Omaha Printing company; 11, Frank W. Hodge, Jr., and his Nightingale orchestra; 11:30, Arthur Hays, organist.

WOC, Davenport, Ia. (483.6). 6:30 p. m., sandman's visit, Val McLaughlin; 6:30, Sunday school lesson, Rev. M. A. Getzenauer; 9, Beethoven Octet; 11, Louis Connor and his LaRocha hotel orchestra; Peter MacArthur, baritone.

WOL, Chicago, Ill. (447.5). 3-4 p. m., Jerry Sullivan, percolator; Harry Geise, chief coffee pot; 7-8, dinner concert, Ralph Williams and his Rainbo Garden orchestra; Agatha Karlen, reader; Otis Pike Jester, soprano; Mary Thrash House, pianist; 10-8, Ralph Williams and his Rainbo Skylarks; Melodians, Laurie, Eddie, Bonnie; Alfred Tweed, harmonica soloist; George A. Little, Larry Shay, harmony singers; Clarence Theodor, tenor; Rick, Whalen, Gardner, harmony singers; Clyde Hares.

WSAI, Cincinnati, Ohio (325.9). 8 p. m., chimes; 8:15, Bicycle sextet; 9, news review, Allison F. Stanley; 9:15, Bicycle mate quartet, Bicycle mixed quartet; 10, Roger Hill's danceland orchestra.

WSB, Atlanta, Ga. (428.3). 8-9 p. m., Georgetown girls' orchestra; 10:15, Hired Help jubilee.

WTAS, Elgin, Ill. (302.8). 8-11 p. m., Boss Own orchestra.

Mountain Time Stations

The following schedules of programs are given in Mountain time. To change to Eastern time, add two hours; Central time, add one hour; Pacific time, subtract one hour.

KOA, Denver, Colo. (322.4). 9-12 midnight, Joe Mann and his Rainbow Lane orchestra.

Pacific Time Stations

The following schedules of programs are given in Pacific time. To change to Eastern time, add three hours; Central time, add two hours; Mountain time, add one hour.

KFI, Los Angeles, Calif. (467). 7:45-8 p. m., Lake Arrowhead dance orchestra, Mel Nelson, leader; 7:45-8, the Bookshelf, Nancy; 8-9, Examiner, Downey, Calif., Chamber of Commerce program; 9-10, Olive Sherlock, violinist; Gertrude Childs Huntington, soprano and David L. Rice in classical program; 10-11, Packard Radio club, Bill and Polly Hill, Way Watts, Barney Weber.

KFOA, Seattle, Wash. (384.4). 6:45-8:15 p. m., Rhodes' Dept. store program; 8:30-10, Seattle Times dance music.

KGO, Oakland, Calif. (361.2). 4:50-5:30 p. m., concert orchestra, Hotel St. Francis; 8, Amphion club; J. Winston Petty, cellist; Dean Donaldson, violinist; Austin Ayer, flutist; Evelyn Hill, clarinet; Beatrice Colton, pianist; French songs, Helen Badaluzzi; Margaret Fish, pianist; Mary Acella Chamberlain, violinist; Scott Elder, violinist; Beatrice Colton, pianist; Charles S. Douglas, tenor; Frank Kenke, pianist; California string quartet; "The Philippines," John W. Dunlop; 10-11, Henry Halstead's orchestra.

KGW, Portland, Ore. (491.5). 12:30 p. m., Rose City trio; 10, Colburn's Melody Men.

KHJ, Los Angeles, Calif. (404.1). 6-6:30 p. m., Art Hickman's Biltmore hotel concert orchestra, Edward Fitzpatrick, director; 6:30-7:30, little stories American history, Prof. Walter Sylvester Hertzog; Dolly Wright (7) and Elsie Jeanette (6), readers, Uncle John; 8-10, feature program, Los Angeles Soap company, arranged by Howard Johnson; 11-2 a. m., the Lost Angeles of KHJ radio.

KJR, Seattle, Wash. (384.4). 1:30-2 p. m., sports talk, Royal Brougham.

KNX, Hollywood, Calif. (336.9). 6:15-7 p. m., dinner hour music; 7-8, program, West Coast theaters, Inc., by remote control; 9-10, feature program; 10-11, Abe Lyman's Columbia Grove dance orchestra, from Ambassador hotel; 11-2 a. m., Hollywood night, compliment to Ruth Roland.

KPO, San Francisco, Calif. (420.3). 8-12 midnight, Art Weidner's dance orchestra.

Sunday, March 22

Sunday, silent night for: AT9, CHNC, CHIC, CKAC, KFAB, KFAE, KFKU, KFKX, KFMQ, KFXK, KLB, KOB, KSAC, PWX, WAHG, WBAV, WDAF, WDFW, WEAO, WEBJ, WEBW, WFI, WGBS, WGBT, WHAS, WHAD, WHAZ, WIP, WKAQ, WLBL, WOL, WRC, WSAC, WTAM.

Eastern Time Stations

CKAC, Montreal, Can. (410.7). 4:30 p. m., band concert.

KDKA, Pittsburgh, Pa. (309.1). 6:30 p. m., Pittsburgh Athletic association orchestra; 7:30, First United Presbyterian church; 9-10, "God's Time is Best," J. V. O'Brien, director, given by music dept. Carnegie Institute of Technology.

WBBR, New York, N. Y. (272.6). 10 a. m., Watchtower orchestra; 10:10, Fred Tworochek, tenor; 10:20, Watchtower orchestra; 10:35, Bible lecture; 11, Watchtower orchestra; 11:10, Fred Tworochek; 11:20, Watchtower orchestra; 9 p. m., instrumental trio, Theodore Pfannenbecker, Howard Griggs, Gustav Rehn; 9:20, choral singers; 9:35, Bible lecture; 10:05, choral singers; 10:20, instrumental trio.

WCAE, Pittsburgh, Pa. (461.3). 10:45 a. m., services, Rodef Shalom temple; 3 p. m., People's Radio church service; 4, Prof. Otto Kallits, pianist; 6:30, dinner concert, William Penn hotel.

WCAU, Philadelphia, Pa. (278). 5:15 p. m., sermon, Rev. John Stockwell; 6, Hotel Pennsylvania concert orchestra; 7, Hotel Pennsylvania concert orchestra; 8:20, Paul Specht's orchestra.

WCX, Detroit, Mich. (516.9). 10:30 a. m., church services.

WDWF, Providence, R. I. (440.9). 10 a. m., chimes; 5-8:45 p. m., Venetian serenades; Philharmonic pipe organ.

WEAF, New York, N. Y. (491.5). 8:15-9:20 p. m., Roxy and his gang, Capitol theater; 9:20-10:15, organ recital.

WEAR, Cleveland, Ohio (389.4). 1-2 p. m., Allen theater orchestra, Phillip Spitznagel, conductor; 3:30-5, twilight concert, Ivan Fraimovich and his Hotel Cleveland orchestra; 8-9, musical program; 9-10, Ruth King.

WEEI, Boston, Mass. (475.9). 3:45-5:30 p. m., Y. M. C. A.; 7:30-9:15, Roxy and his gang; 9:15-10:15, organ recital, Columbia university chapel.

WFI, Philadelphia, Pa. (384.5). 10:20 a. m., services, Arch Street M. E. church; 4:30, studio services.

WGBS, New York, N. Y. (315.6). 3:30-4:30 p. m., program, Piccadilly theater.

WGB, Buffalo, N. Y. (319). 3-4 p. m., vesper service; 4-5, John F. Gundersman, Jr., organist; 7:15, Central Presbyterian church service, William Wall Whiddell, organist, and Dr. Robert J. MacAlbin, speaker.

WGY, Schenectady, N. Y. (379.5). 10:30 a. m., First Reformed church; 2:45 p. m., WGY Symphony orchestra;

Elizabeth Roehr, soprano; 7:30, First Reformed church; 8:45, Waldorf-Astoria orchestra.

WHN, New York, N. Y. (361.2). 3-4 p. m., program, Queens County Christian Endeavor; 4-4:15, Walter Schuster, tenor; 4:30-5, Collegiate dance club; 5-5:30, Roseland dance orchestra; 5:30-6, Oleott Vail and his string trio; 10-10:45, Gem Razzor entertainers; 10:45-11:15, Janssen's Hofbrau Commanders orchestra; 11:15-12, Connie's Inn revue; 12-1 a. m., Harry Richman and his entertainers.

WIP, Philadelphia, Pa. (508.2). 3:15 p. m., Civic Junior Symphony orchestra, direction Albert N. Hoxie.

WJAR, Providence, R. I. (305.9). 7:30-9:15 p. m., music, Roxy and his gang, Capitol theater; 9:15-10:15, organ recital.

WJY, New York, N. Y. (405.2). 8:15-9:15 p. m., American Orchestral society; 9:45-10, Roy G. Parker, tenor.

WJZ, New York, N. Y. (454.3). 2:30-3:30 p. m., Radio Bible class, Federation of churches; 4-5 vesper services, St. George's church; 7-8, Nathan Abas, Hotel Pennsylvania orchestra; 8-8:30, Tuskegee Institute quartet; 10-10:30, Max Kalfus, tenor.

WLIT, Philadelphia, Pa. (394.5). 8 p. m., Laserorg quartet; "Immigration," discussion by the Forum.

WMAK, Lockport, N. Y. (265.5). 10:30 a. m., First Methodist Episcopal church, Rev. Paul Burt.

WMBF, Miami Beach, Fla. (384.4). 10-2 a. m., Nautilus hotel orchestra; Rosebrook's Radio serenaders.

WNYC, New York, N. Y. (526). 9-11 p. m., Brooklyn Mark Strand theater program, Edward L. Hyman, director.

WOD, Philadelphia, Pa. (308.2). 2:30 p. m., services, Bethany Sunday school; 6:05, organ recital, Clarence K. Bawden; 7:30, services, Bethany temple; Caroline Quigg, organist.

WOR, New York, N. Y. (405.2). 3-3:15 p. m., Y. M. C. A. talk; 7:30-9:30, Shrine band; 8:20-9:30, Bradford theater program; 9:30-10:30, talk, Dr. Sigmund Spaeth; 10:45-11:30, Perry and Russell; 11:30-12, Commanders orchestra.

WPG, Atlantic City, N. J. (299.8). 3:15 p. m., Arthur Scott Brook, organist; Mrs. Esther Kelly, soprano; 4:15, instrumental music, St. James Episcopal church, Rev. Wm. Blatchford, pastor; 10, jubilee songs, Ashbury A. M. E. church choir, Prof. W. F. Miller, choir director; Arthur Scott Brook, organist; Alice Warren Schae, pianist.

WRO, Lansing, Mich. (285.5). 10 a. m., chimes, Relfry Plymouth Congregational church; 10:30, services, First



The Ostrandars Electral string sextet is a popular Pacific coast radio feature and will be heard this week from KFOA, Seattle.

Presbyterian church, Dr. Guy W. Simon, pastor; Dwight Steere, organist; 7, First Baptist church; Helen Dodge Stack, soprano; Mrs. Henry Chambers, organist.

WWJ, Detroit, Mich. (352.7). 11 a. m., St. Paul's Episcopal cathedral; 2 p. m., Detroit News orchestra; 7:20, Roxy and his gang.

Central Time Stations

CHYC, Montreal, Can. (410). 7 p. m., people's forum, Lillian M. Faithfull, M. A., J. P. of England; 9, Stanley quartet studio.

CKY, Winnipeg, Can. (384.4). 7 p. m., Westminster Presbyterian church.

KIAP, Siftipok, Minn. (421). 4-5 p. m., twilight musicale.

KFMX, Northfield, Minn. (336.9). 7 p. m., college vesper service.

KFNH, Shenandoah, Ia. (266). 10:45 a. m., First M. E. church; 3 p. m., Maryville Y. M. C. A. Gospel team; 8:30, Golden Rule circle; S. Christian church.

KFUO, St. Louis, Mo. (545.1). 1 p. m., program, children's choir, Zion Lutheran church; 9:15, "The Pentecent Thion," Rev. Joseph Frenz; Choir, Grace Lutheran church.

KTHS, Hot Springs National Park, Ark. (374.8). 11-12:15 p. m., Central Methodist church, Rev. J. J. Stove, pastor; 8:30-10, Meyer Davis-New Arlington hotel orchestra; 10-11:30, Phil Baxter and his singing orchestra.

KYW, Chicago, Ill. (535.4). 11 a. m., Central church service, Dr. Frederick P. Shannon; 4-5 p. m., classical concert, Chicago Sunday evening club service, Dr. Alfred E. Stearns.

WBAP, Fort Worth, Tex. (475.9). 11 a. m., services, St. Paul's M. E. church, Rev. C. D. Meade, pastor; 4 p. m., Rialto theater; 11, Kermer's Crazy hotel orchestra.

WBBM, Chicago, Ill. (226). 8 p. m., Hal Page orchestra, Cox, John Pat, Ned Santay, Lew Clark, Walter Duff, Lou Butler, Rose, Our Jerry, Cort Banks.

WBCN, Chicago, Ill. (266). 10:30-12 p. m., People's Liberal church; 4-5 p. m., Lala & Son classical concert; 5:15-8:15, vesper services, Emerald Avenue Presbyterian church; 7-8, Blue Bird serenaders; 8-10:30, Midway dancing gardens orchestra; Mrs. Margaret Conroy, reader; Jack Little and Paul Small; Florence Tenney, blues singer; Borden brothers, Wollen's Bellhop Six; Florence Eastman, contralto; Tom Owens' barn dance trio; Big Boy Yagle.

WCAL, Northfield, Minn. (336.9). 8:30 p. m., sermon, Dr. Martin Hegland.

WCOB, Zion, Ill. (344.6). 8 p. m., male chorus; brass quartet; celestial bells; Dorothy Bull, soprano; Ralph Bull, tenor; Mrs. Luke Ball, soprano; Mark White-side, baritone; L. J. Hire, violinist; P. B. New-comer, cornetist.

WCCO, Minneapolis-St. Paul, Minn. (416.4). 11 a. m., Trinity Baptist church; 4:10 p. m., House of Hope Presbyterian church, Rev. H. C. Swearingen, pastor; 7:30, First Baptist church, Rev. W. B. Riley, pastor; 9, University of Minnesota program.

WDAF, Kansas City, Mo. (365.6). 4-5 p. m., program, St. Joseph, Mo.; 5-5:30, International Sunday school lesson, Dr. Walter L. Wilson.

WEBH, Chicago, Ill. (370.2). 5-6 p. m., twilight musicale; 7-9, artists program.

WEBW, Beloit, Wis. (268). 4:30-5:30 p. m., vesper services, Beloit college.

WEMO, Barron Springs, Mich. (286). 11 a. m., sacred music, Radio Lighthouse choir, Catherine Borgen,

violinist; Rena Eby, flutist; Mrs. A. A. Fellows, soprano; 11:15, sermon, Pastor W. B. French; 8:15, Fanny Crosby Memorial program; short account of her life, Prof. H. L. Pearson; Mary Lou Luocco, soprano; Nelva Mundt, Rena Eby, Opal Hoover; 9, memorial address, Pastor W. B. French.

WFAA, Dallas, Texas (475.9). 6-7 p. m., Radio Bible class, Dr. William M. Anderson; 7:30-8:30, Central Congregational church, Dr. Thomas H. Harper, pastor; 8:30-9:30, Baylor College Choral club; 9:30-11, Fox Trotters orchestra.

WGN, Chicago, Ill. (370.2). 3 p. m., Tribune Master artist concert, Albin Stredel, violinist; Ferdinand Stredel, pianist; 3:30, program, Chicago Musical college; 9-10, "An Evening with the Composers."

WHAS, Louisville, Ky. (399.8). 9:57 a. m., organ music, 10, church service, Methodist Temple; 4:30, choral evening service, Christ church cathedral.

WHB, Kansas City, Mo. (365.6). 9:40-11 a. m., Linwood Boulevard Christian church, Dr. Burris A. Jenkins; 2-3 p. m., classical program; 8-9, Christian Science services; 9-10, classical program; 12, Gilbert Jaffy and his Music Masters; organ recital, Linwood theater.

WHO, Des Moines, Iowa (526). 11:15 a. m., sermon, Dr. Charles S. Medbury; 4 p. m., Zeagazig Shrine band; 7:30, Reese-Hughes orchestra.

WLS, Chicago, Ill. (344.6). 6:30 p. m., Ralph Emerson, organist; 7, program, quartet, choir, Sheridan Road M. E. church, John Minnehan, director; Maude Boulough, soprano; Larone Boulton, contralto; Joel Lay, baritone; Arthur Bowers, tenor.

WLW, Cincinnati, Ohio (422.3). 9:30 a. m., school, editorial staff of Sunday school publications, Methodist Book concern; 11, services, Church of Covenant, Dr. Frank Stevenson; 7:30 p. m., services, First Presbyterian church, Dr. Frederick McMillan, minister; 8:30, Western and Southern orchestra, William Koop, director; Slim Bryant, basso.

WOAI, San Antonio, Tex. (394.5). 11 a. m., services, First Presbyterian church; 7:30 p. m., Central Christian church; 9:30, WOAI entertainers present "Pagliacci."

WOAW, Omaha, Nebr. (526). 9 a. m., Radio chapel service, Rev. R. H. Brown; 2:15 p. m., Nebraska Wesleyan Glee club; 6, Bible study period, Mrs. Carl R. Gray; 9, chapel service, Dundee Presbyterian church, Dr. McLeod, pastor.

Monday, March 23

Monday, silent night for: AT9, CHIC, CKY, CKAC, KFMQ, KFXK, KFUD, KGW, KHJ, KYW, PWX, WBGD, WDFW, WEAO, WEBJ, WEBW, WFI, WGN, WHAS, WIP, WJY, WKAQ, WLBL, WSAC, WMAQ, WAIL, WOC, WQJ, WRC, WREG, WSAC.

Eastern Time Stations

CHNC, Toronto, Can. (357). 8:30 p. m., CHNC trio, Frank Blachford, violinist; Leo Smith, cellist; Harvey Robb, pianist; Lois Eric Watson, Schuch singers.

KDKA, Pittsburgh, Pa. (309.1). 6:15 p. m., EDKA Little symphony orchestra; 7:30, "Daddy" Prank and his musical rhyme machine; 8:15, "America and the Far Eastern Policy," Dr. Benjamin H. Williams; 8:30, concert.

WAHG, Richmond Hill, N. Y. (315.6). 8-8:15 p. m., Horace J. Taylor, reader; 8:15-8:30, Arthur D. Nelson, tenor; 8:30-9, Synchrophase string trio; 9-9:15, Viola Scherer, soprano; 9:15-9:45, Synchrophase string trio; 9:45-10, Arthur D. Nelson, tenor; 10-10:15, Maude Mason, pianist; 10:15-10:30, Viola Scherer; 10:30-11:30, Glenn C. Smith's Paramount orchestra; 12-2 a. m., special program, Adamo Symphonic concert orchestra, John V. Adamo, director.

WBBR, New York, N. Y. (272.6). 8 p. m., Syrian Orienta, music; 8:10, Ruth de Boer, contralto; 8:20, World News Broadcast; 8:10, Ruth de Boer, contralto; 8:50, Syrian Oriental music.

WCAE, Pittsburgh, Pa. (461.3). 6:30 p. m., dinner concert, William Penn hotel; 7:30, Uncle Kaybee; 8:30, Mrs. Louise MacMaster, soprano; MacMaster, baritone; 9, A. & P. Gypsy string ensemble; 11, Night of mystical dirgible, Press-Kaybee; Blackstone theater orchestra.

WCX, Detroit, Mich. (516.9). 4:15 p. m., musical program; 6, dinner concert, Book-Cadillac hotel; 8:30, musical program.

WOAW, New York, N. Y. (491.5). 6-7 p. m., dinner music, Waldorf-Astoria; 7-7:15, Grace Richards, soprano; 7:15-8:30, Strand theater program; 8:30-9, Cashman's Sons, Inc.; 9-10, A. & P. Gypsies; 10-11, Spear and company, home entertainers; 11-12:30 a. m., Ben Bernie's Hotel Roosevelt orchestra.

WEAR, Cleveland, Ohio (389.4). 7-8 p. m., musicale, Loew's State theater.

WEEI, Boston, Mass. (475.9). 6:30 p. m., Big Brother club; 7:30, Dok-Eisenburgh and his Sinfontans; 8, Fabian Concert company; 8:40, Maria Lerman Kowal-ewska, soprano; 9, A. & P. Gypsies; organ recital.

WFI, Philadelphia, Pa. (394.5). 3 p. m., readings of John Greenleaf Whittier by Elizabeth Palne; Eldon Smith, tenor; 6:30, Meyer Davis' Bellevue Stratford concert orchestra; 7, bedtime stories.

WGBS, New York, N. Y. (315.6). 6-6:30 p. m., Uncle George; 6:30-7, Lew R. Lipp, orchestra; 7-7:10, talk on camps, Major E. M. Fish; 7:10-8, W. G. R. (319), 6:30-7:30 p. m., Knell's Tokio orchestra; 8-9, recital, George Albert Bouchard and associates; 9-10, musical program, Robertson-Cataraed Electric company; 10-10:30, Bill Wilson, Scotch comedian; 11-1 a. m., supper-dance music, Vincent Lopez' Hotel Statler dance orchestra, Harold Gieser, director.

WGY, Schenectady, N. Y. (379.5). 6:40 p. m., Hotel Ten Eyck trio; 7:30, WGY orchestra; Virginia Zimmerman, reader; Peter Schmidt, clarinetist; American trio; Ollie G. Yeltra, pianist; Giovanni Trombini, cellist; Edward J. Rice, violinist.

WHAZ, Troy, N. Y. (379.5). 9 p. m., Troy Chamber of Commerce night; 10:30, popular program.

WHN, New York, N. Y. (361.2). 6:30-7 p. m., violin solos, Oleott Vail; 7-7:10, fashion chats, Mme. Belle; 7:30-7:35, health talk, Dr. Landis; 7:35-8, Hotel Carlton Terrace orchestra; 8-8:05, "Storage Batteries," E. J. Shubert; 8:05-8:20, Roseland dance orchestra; 8:50-9:20, Littmann's Employed orchestra; 9:30-10, Dan Gregory and his Crystal Palace orchestra; 10-11, Jack Shack; 11-11:30, Chateau Shanley orchestra; 11:30-12, Jimmy Kelly and his Club Lyman orchestra; 12-12:30 a. m., Silver Slipper revue with Jim Carr and his orchestra.

WIP, Philadelphia, Pa. (508.2). 6:05 p. m., Clarence Seaman's orchestra; 7, Uncle Wip's bedtime stories.

WJAR, Providence, R. I. (305.9). 8 p. m., musical program from our studio; 9, A. & P. Gypsy string ensemble.

WJZ, New York, N. Y. (454.3). 7-8 p. m., Bernhard Levittov's Hotel Commodore dinner-concert; 8-8:10, Wall Street Journal reviews; 8:10-8:20, N. Y. U. air college; 9:10-9:50, "Commencing Garden Operations," John A. Fieseler of Peter Henderson and company; 10:15-10:30, Ada Welngartner, soprano.

WLIT, Philadelphia, Pa. (394.5). 7:30 p. m., Dream Daddy's bedtime stories; 9, Laura T. Bast, contralto; Ethel Smeltzer Littlehales, soprano; Pennsylvania male quartet; 10-10:15, Aracelia cafe dance orchestra; vaudeville features from Eddy Knickerbocker theater.

WMAK, Lockport, N. Y. (265.5). 8 p. m., Mrs. David Meahl, musical director; 9, Rialto theater program.

WMBF, Miami Beach, Fla. (384.4). 10-2 a. m., Nautilus hotel orchestra; Rosebrook's Radio serenaders.

WNYC, New York, N. Y. (526). 7-7:30 p. m., Harry Ash's orchestra; 7:45-8:15, Harry Ash's orchestra; 8:15-8:25, 8:25-9:30, program; 9:30-10, instrumental novelties; 10:10-10:20, "Trend of the Times," Dr. Sydney N. Usher.

WOD, Philadelphia, Pa. (508.2). 7:30 p. m., A. Candelari's concert orchestra; 8, concert from Mark Strand theater through WEAF; 9, A. & P. Gypsies; 11, Rizzo's dance orchestra.

WOR, New York, N. Y. (405.2). 6:15-6:30 p. m., Hotel Lorraine orchestra; 6:30-2, moon in moon stories; 7-7:30, Hotel Lorraine orchestra.

WTAM, Cleveland, Ohio (389.4). 6-7 p. m., Guy Lombardo and his Royal Canadians; 8-11, New Philadelphia Saxophone serenaders; 11-12, organ recital.

WVJ, Detroit, Mich. (352.7). 3 p. m., Detroit news orchestra; 6, dinner concert; 8, Detroit News orchestra; 9, concert from WEAF.

Central Time Stations

KFAB, Lincoln, Nebr. (240). 7:30-9:30 p. m., Fred Shannon and his orchestra; Orville Andrews, Bulck song bird; Honolulu Royals-Hawaiian entertainers.

KFKU, Lawrence, Kansas (275). 8:50 p. m., piano tuning-in numbers; 7, music; 7:15, Training for Brick Athletics; Karl Schlatterer; 7:30, "Conducting for Teachers," Prof. Allen Crafton; 7:45, Spanish lesson.

KFKX, Hastings, Neb. (288.3). 9:30-11:30 p. m., program, auspices Wolbach & Branch store.

KFNH, Shenandoah, Ia. (266). 6:30 p. m., concert, Henry Field Seed company; 8:30, music.

KIAP, Siftipok, Minn. (421). 9-10 p. m., Electric Light company program.

KSAC, Manhattan, Kan. (340.7). 7:20 p. m., college band, H. P. Wheeler, director; 7:30, "Hamshire, Shropshire & Southdown Breeds," C. E. Reed; 7:40, College band; 7:50, "Care and Operation of Farm Separator," Louis E. Olson.

KSD, St. Louis, Mo. (545.1). 7 p. m., Lion's club of St. Louis; 9:30, John Halk, violinist; Mrs. Julie Stevens Bacon, pianist.

KTHS, Hot Springs National Park, Ark. (374.8). 8:20-9:10 p. m., concert, male and mixed quartets; 9:10-10, Meyer Davis' New Arlington orchestra; 10-11, Charles L. Fischer's 11-piece Eastman hotel orchestra; 12:15, 1:15, late frolic, Jack Bernard and his Meyer Davis' New Arlington orchestra.

WBAP, Fort Worth, Tex. (475.9). 7:30-8:30 p. m., program, Mrs. Edith Casey, director; 9:30-10:45, Ward's "Trail Blazers."

WCAL, Northfield, Minn. (336.9). 11 p. m., organ recital, Elnor Overland.

WCOB, Zion, Ill. (344.6). 8 p. m., Mrs. J. D. Thomas, soprano; P. M. LaRose, contralto; Zion band; Mrs. S. H. DePew, reader; Miss Lulu Myers, pianist.

WCCO, Minneapolis-St. Paul, Minn. (416.4). 6:30 p. m., surprise program; 8, "Preparation for Lambing," Philip Anderson; 8:15, "Clean Seed," A. C. Arney; 8:30, Barrett's municipal band; 10, George Osborn's Original "Noodle" hotel orchestra; Bergalagsmors, Swedish soprano; Bernie and Robinson, singing team.

WCEE, Elgin, Ill. (275). 11-12 midnight, Carlisle Star Monday program.

WDAF, Kansas City, Mo. (365.6). 5-5:30 p. m., weekly boy scout program; 6-7, Cecile Burton, reader; Tri-

(Continued on page 11)

JIMMY CLARK'S ARTISTS AT WEBJ

Monday, March 23

(Continued from page 10)

anon ensemble; 8-10. Around the town with WDAF; 11:45-1. Merry Old Chief. Plantation players.

WEBW, Beloit, Wis. (268). 8-9 p. m., concert, Beloit college; Prof. Max Miranda, leader of music; short talk, Professor H. D. Densmore.

WEMC, Berrien Springs, Mich. (286). 8:15 p. m., commercial club of Dowagiac Round Oak band; male quartet; vocal solos, Mary Felker; Wilma Bakeman, pianist; speech, Attorney Jack Pollack.

WFAA, Dallas, Texas (475.9). 8:30-7:30 p. m., Buddy's Blue Melody Boys' orchestra; 8:30-9:30, musical program from Bonham.

WGN, Chicago, Ill. (370.2). 6 p. m., organ recital, Lyon & Healy; 6:30-7, Drake concert ensemble, Blackstone string quintet.

WGST, Atlanta, Ga. (270). 9-10 p. m., Marionette orchestra.

WHA, Madison, Wis. (535.4). 7:45 p. m., Prof. Cecil Burleigh; violinist; "Food and Nutrition," Mrs. Nellie Kozlitz Jones.

WHAD, Milwaukee, Wis. (275). 7:30 p. m., Marquette university glee club and band program.

WHAS, Louisville, Ky. (399.8). 4-5 p. m., concert, Louisville Conservatory of Music; Jack Little, Paul Small.

WHB, Kansas City, Mo. (365.6). 2-3 p. m., ladies' hour; 7-8, special men's and boys' hour.

WHO, Des Moines, Iowa (526). 7:30-8 p. m., Stewart Watson, American baritone; Helen Birmingham, accompanist; Selma MacAddow Herndon, soprano; 8-9, program, Dean Holmes Cowper, director; 11:15-12, L. Carlos Meier, organist.

WLW, Cincinnati, Ohio (422.3). 8 a. m., physical exercises, Central Y. M. C. A., William Stradman, instructor; 12-15, Lenten services, Rev. G. H. Case; 4, pupils of Helen Abnerie in recital; 6, dinner hour concert; 8, Times-Star orchestra, directed by William Kemp; Howard Hartford, tenor; Ewald Haum, flutist.

WOAW, Omaha, Nebr. (526). 6 p. m., Arthur Hays, organist; 6:30, music; 6:45, dinner program; 9, program, Council Bluffs Typographical union; 10:15, music.

WOI, Ames, Iowa (270). 10 p. m., program of popular music.

WORD, Batavia, Ill. (275). 7-8 p. m., children's hour, Uncle Nick; 8:10-30, musical program, Humane society, Mrs. Grosham; director, scientific lecture, Dr. Golze; "Fall of Man," C. H. Swingle.

WOS, Jefferson City, Mo. (440.7). 8 p. m., "The Show-Me Split," John Boyd; Al Moore's orchestra; Howard-Payne colleges.

WQI, Chicago, Ill. (447.5). 3-4 p. m., "What Comes

KLX, Oakland, Calif. (508.2). 9:30-10 p. m., American Theater orchestra; 10, Lake Merritt Ducks.

KNX, Hollywood, Calif. (336.9). 6:15-7 p. m., program, John A. Evans corporation, Hacienda Park orchestra, Paul Finslein, director; 7-8, program, West Coast theater; 8-10, KNX feature program; 10-11, Goodrich Silvertown cord orchestra, Chas. Lindser, leader; Lilyan May Challenger, contra-contralto; 11-12, Abe Lyman's Cocomat Grove dance orchestra from Ambassador hotel.

KPO, San Francisco, Calif. (420.3). 4:30-5:30 p. m., Rudy Selger's Fairmont Hotel orchestra; 5:30-6:30, children's hour stories; 6:30-7:30, Rudy Selger's Fairmont Hotel orchestra; 8-9, Theodore J. Irwin, organist; Mrs. Mark T. H. Shawyer, contralto; 9-10, program, auspices J. Albee Clean company; 10-11, Gene James' Rose Room Bowl orchestra.

Jimmy Clark and his White Way entertainers; 8-8:15, Sara V. Turits; Eleanor Fastenberg; 8:15-9, Traub trio.

WEEI, Boston, Mass. (475.9). 4 p. m., Shawmut Juvenile Synchronators; 6:30, Big Brother club; 7:15, Alice Sampson, contralto; 7:30, Dok-Eisenbourg and his Sinfonians; 8, musicale from New York; 8:30, Gold Dust Twins; 9, Eveready hour; 10, Goodrich Silvertown cord orchestra.

WFI, Philadelphia, Pa. (394.5). 3 p. m., Women's Symphony orchestra, J. W. F. Leman, conductor; 6:30, Meyer Davis' Bellevue Stratford concert orchestra; 7, Boy Scouts' period; 8, concert from WFAF; 9, Eveready hour; 10, Goodrich Silvertown cord dance orchestra.

WGSS, New York, N. Y. (315.6). 6-6:30 p. m., Uncle Guey; 6:30-7, Jersey Collegians; 9-9:10, new astrology; Belle Bart; 9:10-9:30, Pasquill Ferrara, tenor.

WPG, Atlantic City, N. J. (299.8). 7 p. m., Hotel Ambassador dinner music; 9, double trio, Chalfonte-Haddon hall; 10, Amusement Publishing company, Arthur Walker, director; Ruby Cordery Warke, pianist; 11, Paul Whittman's Hotel Traymore dance music.

WRC, Washington, D. C. (468.5). 6:45 p. m., children's hour, Peggy Albion; 7, Meyer Davis' New Willard; 8, "Show Shopping," Leonard Hall; 8:10, Ruth Peter, soprano; 9, Brunswick Music memory concert, WJZ.

WGY, WBZ, KDKA, KYW; 19:15, Elizabeth Winston, pianist, WJZ, WGY; 10:30, Meyer Davis' Le Paradis band.

WREO, Lansing, Mich. (285.5). 8:15-9:45 p. m., Reo Broadcasting band, Carl Hall Dewey, director; string quartet.

WTAM, Cleveland, Ohio (389.4). 6-7 p. m., Hotel Statler concert orchestra.

WWJ, Detroit, Mich. (352.7). 6 p. m., dinner concert; 8, concert from WFAF.

Central Time Stations

CKY, Winnipeg, Can. (384.4). 7:30 p. m., lecture, Prof. W. T. Allison; 8, Winnipeg Piano company; 9, musical program, Capitol theater, Earle Hill's orchestra.

KFMQ, Fayetteville, Ark. (299.8). 9 p. m., sacred choir, First Presbyterian church, Harry Shultz, director.

KSAC, Manhattan, Kan. (340.7). 7:20 p. m., college quartet; 7:30, Time of Cutting Alfalfa; 8, C. Salmon; 7:40, college quartet; 7:50, "Building the Poultry House," J. H. McAdams.

KSD, St. Louis, Mo. (545.1). 6 p. m., Benjamin Rader's orchestra; 9, Hugo Diederichsen, baritone.

KTHS, Hot Springs National Park, Ark. (374.8). 8:20-9 p. m., Charles L. Fischer's Eastman hotel orchestra; 9-9:20, address; 9:20-10, Meyer Davis' New Arlington orchestra.

KYW, Chicago, Ill. (535.4). 7 p. m., Congress hotel concert; 7:30, "New Tractors from Old Ones," J. E. Hill; "Monthly Analysis of Farm Markets," H. W. Moorhouse; 8, Brunswick hour; 9, Helen Shaffer, soprano; Ray de St. Aubin, baritone; Harold O'Brien, violinist; Stephenson & Heather, vocal duos; 10-11:30, evening at home program; 1-2 a. m., insomnia club; Coon-Sanders Original nightclubs.

WBAP, Fort Worth, Tex. (475.9). 7:30-8:30 p. m., Harmony club; 9:30-10:45, musical program, artists College of Industrial Arts, Denton.

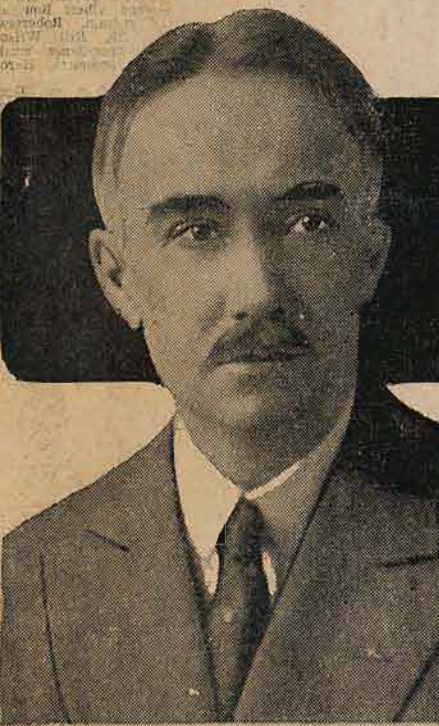
WBBM, Chicago, Ill. (226). 8 p. m., Gray Dawn orchestra, Tell Taylor, Our Mr. Marthens, M. Silverman, Jack Perry, Cora Banks, Our Jerry.

WBCN, Chicago, Ill. (266). 7-8 p. m., Lillian Bolens, soprano; Robert Gauthier, pianist; 8-8:30, Marie Wright, soprano; Midway dancing gardens orchestra; Axel Christensen, pianist; Will Roslter's Melody girls; Finney Briggs, humorist; Jack Little and Paul Small; Anna Flemming Kenney, soprano; Collette Flynn, pianist; Tony Prince; Larry Loser, tenor; 12-2 a. m., Plato ship.

WCBD, Zion, Ill. (344.6). 8 p. m., Zion orchestra; Daniel Mason, trombonist; Mrs. J. D. Thomas, soprano; Mrs. Hulda Klammer, reader.



B. C. Bean, friend and official biographer of Luther Burbank, will talk March 24 at WLS. Helen Spring, leading woman of the Harry Bond players, gives stage style talks from WGY. She will give her next lecture March 31. Dorothy Lake (right) has a sweet lyric soprano voice often heard from Philadelphia stations. She sings most often at WFI.



Tuesday, March 24

Tuesday, silent night for: AT9, CHNC, CRIC, KFAB, KFAE, KFBU, KFUX, KFVX, KFNE, KFUD, KLX, KOA, KOB, PWX, WAHG, WBAV, WBBR, WCAL, WCBD, WEAQ, WEMC, WGST, WHAD, WHAZ, WHO, WOI, WOO, WOS, WSAC.

Eastern Time Stations

CKAC, Montreal, Can. (416.7). 7 p. m., kiddies' stories; 7:30, Windsor hotel dinner concert; 8:30, studio concert; 10:30, Windsor hotel dance program.

CNRA, Moncton, Can. (312.3). 7:30 p. m., artists from North Kingston, John M. Hurlley, John Hurlley, tenor; Eleanor Nelson, pianist; Ida Hurlley, elocutionist; Rainbow Melody Boys.

KDKA, Pittsburgh, Pa. (309.1). 6:15 p. m., dinner concert, William Penn hotel; 7:30, Radio Godmother; 7:45, "Overcoming Patriotic Prejudice," Dr. John Ray Ewers; 8:30, program, Pittsburgh Advertising club; 9, Brunswick hour of music; 11, concert, Pittsburgh Post studio; 11:30, concert, Grand theater.

WCAE, Pittsburgh, Pa. (461.3). 6:20 p. m., dinner concert, William Penn hotel; 7:30, Uncle Kaybee; 8:30, Gold Dust Twins; 9, Eveready hour; 10, Goodrich Silvertown cord orchestra.

WCAU, Philadelphia, Pa. (278). 6 p. m., dance orchestra; 7, Paul Specht's dance orchestra; 7:30, B. Snellenburg concert; 8, Cleve-Chandler trio; 8:15, electrical talk, G. Bertram Regar; 10:20, Paul Specht's dance orchestra.

WDX, Detroit, Mich. (516.9). 4:15 p. m., musical program; 6, dinner concert, Book-Cadillac hotel; 8:30, musical program; 10, The Red Apple club.

WDWF, Providence, R. I. (440.9). 8:30-9:30 p. m., Vincent Lopez Arcadia dance orchestra.

WEAF, New York, N. Y. (491.5). 6-7 p. m., dinner music from Waldorf-Astoria hotel; 7:15-7:20, "Art in Advertising," Heyworth Campbell; 7:20-7:30, Indian songs, Kituss Tecumseh; 7:30-8, Royal Eastern Electrical Supply company; 8-8:15, talk, Bank of America; 8:15-8:30, Victor Larsen, baritone; 8:30-9, Gold Dust Twins; 9-10, Eveready hour; 10-11, Goodrich Rubber company.

WEAR, Cleveland, Ohio (389.4). 7-8 p. m., Metcalf Memorial organ recital, Vincent H. Perry; 8-10, concert, WEAF.

WEBJ, New York, N. Y. (233). 7-7:15 p. m., Kay Macrae, accompanied by Viola Milner; 7:15-7:45,

9:45-10, Margaret Howard, soprano; 10-10:30, recital, Alede Rankin; 11-12, Hotel Vanderbilt dance orchestra.

WGR, Buffalo, N. Y. (319). 6-7:30 p. m., Halliday string trio; 8-11, musical programs jointly with WFAF including the Gold Dust Twins, Eveready hours and variety entertainment.

WGY, Schenectady, N. Y. (379.5). 7:30 p. m., "Ancient Athletic Sports," Dr. Harrison C. Coffin; Edna Mereness, pianist; Emeline Bates, soprano; 9, Brunswick hour of music; 10:30, Meyer Davis' orchestra; 11:30, Stephen E. Boisclair, organist.

WHN, New York, N. Y. (361.2). 6:30-7 p. m., Strand Roof orchestra; 7:30-7:35, health talk, Dr. Landis; 8:20-9, Dave Harman and his Cinderella orchestra; 9-9:15, popular songs, Bob Miller and Jimmy Flynn; 10-10:15, the New Rockwell Terrace revue; 11-11:30, Eveready revue; 11:30-12, Club Alabama orchestra; 12-12:30 a. m., Parody club revue and orchestra.

WIP, Philadelphia, Pa. (508.2). 6:05 p. m., baseball talk, Monte Cross; 6:15, Harvey Marburger dance orchestra; 7, Uncle Wip's bedtime stories; 8, automobile talk, Eugene Hogle; Philadelphia Police band; 9, "Mikado" West, Philadelphia high school students; 10:05, "Eino's Weekly Movie Broadcast"; 10:30, Harvey Marburger's dance orchestra.

WJAR, Providence, R. I. (305.9). 8 p. m., studio program; 9, Eveready hour; 10, Goodrich Silvertown cord orchestra.

WJY, New York, N. Y. (405.2). 8:15-8:30 p. m., Fairbelt quartet; 8:30-8:45, Mathilda Zimber, cellist; 9:15-10:15, Japan Society annual dinner, Hotel Astor; 10:45-11, Radio Franks, Wright and Bessinger.

WJZ, New York, N. Y. (454.3). 7-7:15 p. m., dog talk, Frank Dole; 7:15-8, Joseph Strissoff's Hotel Vanderbilt orchestra; 8-8:10, Wall Street Journal review; 8:10-8:20, N. Y. air college; 9, Brunswick Music memory concert; 10:15-10:30, Elizabeth, pianist; from WRC, Washington.

WKAQ, San Juan, P. R. (340.7). 8-9:30 p. m., WKAQ orchestra.

WLIT, Philadelphia, Pa. (394.5). 7:30 p. m., Dream Daddy's bedtime stories.

WMBF, Miami Beach, Fla. (384.4). 10-2 a. m., Nautilus hotel orchestra; Rosebrook's Radio serenaders.

WNVC, New York, N. Y. (526). 7:20-7:30 p. m., sports analysis, Thornton Fisher; 7:30-8:45, Bismarck's Radio program; 8:45-9:45, dance program; 9:45-10, song recital; 10:10-10:20, lecture service, Board of Education.

WOOD, Philadelphia, Pa. (508.2). 4:45 p. m., organ recital, Mary E. Vogt.

WOR, New York, N. Y. (405.2). 9-9:10 p. m., "Craig Kennedy," Arthur B. Beeve; 9:30-10:30, Chickering artists; 10:30-11, Manhattan serenaders; 11-11:45, Citro orchestra.

WCOO, Minneapolis-St. Paul, Minn. (416.4). 6:15 p. m., dinner concert, Dick Long's Nankin cafe orchestra; Bernard & Robinson; 8-10, national program from New York.

WCEE, Elgin, Ill. (275). 7-8 p. m., Boss' Own orchestra, Fred Hamra, director; Eddie Loftus, Frank Morris; 11-12, Boss' Own orchestra; Frank Morris.

WDAF, Kansas City, Mo. (365.6). 3:30-4:30 p. m., the Star's Radio trio; 6-6:30, weekly child talent program; 6-7, Tell-Me-a-Story Lady; Radio piano lessons, Maudellen Littlefield; Trionan ensemble; 11:45-1, Newman Nighthawk night.

WEBH, Chicago, Ill. (370.2). 7-8 p. m., Oriole orchestra; Dean Remick, pianist; Riviera theater; 9-10, Oriole orchestra; Dennis sisters, Frank Maxin, Ted Florio, Frank Papile; 11-12, Oriole orchestra; Frank Margal, Ted Florio, Dennis sisters, Jack Penewell, Banks Kennedy, feature acts, Riviera theater.

WEBW, Beloit, Wis. (268). 8-9 p. m., band concert, Fairbanks, Morse company.

WFAA, Dallas, Texas (475.9). 6:30-7:30 p. m., Haulula School of Hawaiian music, J. B. Stevenson; 8:30-9:30, music, K. J. U. class, Tyler Street Methodist church; 11-12, Palaco theater organ, Dwight Brown.

WGN, Chicago, Ill. (370.2). 6 p. m., organ recital, Lyon & Healy; 6:30-7, Drake concert ensemble, Blackstone string quintet; 8-9, Vivian McCarthy, soprano; Slimco band; 10-11, Don Bestor Drake dance orchestra.

WHAS, Louisville, Ky. (399.8). 4-5 p. m., concert, Louisville Conservatory of Music; Jack Little, Paul Small; 7:30-9, Eddie Rosson and his orchestra.

WHB, Kansas City, Mo. (365.6). 8-10 p. m., orchestra; Ralph Walker, baritone; Mrs. John McKenzie, soprano; song, Rev. Wallace Bacon; Frank Gilmore, violinist; Miss Armstrong, soprano.

WLBL, Stevens Point, Wis. (278). 8 p. m., program, auspices Stevens Point Chamber of Commerce.

WLS, Chicago, Ill. (344.6). 6:25 p. m., Ralph Emerson, organist; 6:50, Senate theater; 7, lullaby time, Ford and Glenn; 7:15, WLS Harmony trio; 7:45, Anthony Wons feature; 8, R. E. D. program; Furd and Glenn; Glenn's Cornhuskers, Kenneth Clark; 9, Nubs Allan; 9:10, Anthony Wons, Shakespearean drama; 9:30, Glenn's Cornhuskers; 9:40, Senate Synchronators; 10, Evanston Men's string quintet; 10:30, Glenn's Cornhuskers; 10:40, Ford and Glenn time; 11, Carroll's vaudeville night; 12, revue, Ralph Emerson, Ford and Glenn.

WLW, Cincinnati, Ohio (422.3). 8 a. m., physical exercises, Central Y. M. C. A., William Stradman, instructor; 12:15 p. m., program, Delta Omicron sorority; Clifford Lang, pianist; 4, pupils of Leo Stofren and

(Continued on page 12)

Thursday, March 26

(Continued from page 13)

WBAP, Ft. Worth, Tex. (475.9), 7:30-8:30 p. m., Mansfield Municipal band; 9:30-10:45, popular music, The Troubadours.
WBBM, Chicago, Ill. (226), 8 p. m., Moran Irish Terriers, Cox, Lou Clark, Dave Paton, Lillian Hollans, Mrs. Neelson, Orr Jerry.
WBCN, Chicago, Ill. (370.2), 7-8 p. m., classical hour; 8-8:30, Little and Paul Small; Midway dancing gardeners orchestra; 8:30-9, "Income Tax and Accountancy Encyclopedia of the Air"; 9-12, Elmer Jordan and company; Midway dancing gardeners orchestra; Jack Little and Paul Small; 12-1 a. m., Owl matinee.
WCCO, Minneapolis-St. Paul, Minn. (416.4), 7-8 p. m., national program from New York.
WCAF, Kansas City, Mo. (365.6), 3:30-4:30 p. m., Star; Radio trio; 6-7, address, Louis Meeker; Tell-Me-a-Story Lady; Trianon ensemble; 11:45-1, Merry Old Chief and the Plantation players; Eddie Kohn's Kansas City Athletic club orchestra.
WEBH, Chicago, Ill. (370.2), 7-8 p. m., Ortole orchestra; Robert York, tenor; musical bits, Riviera theater; 9-10, Ortole orchestra; soprano quintet; John Stamford; 10-11, Ortole orchestra; John Stamford, tenor; Belle Forbes Carter, soprano.
WFAA, Dallas, Texas (475.9), 6:30-7:30 p. m., vesper recital, Lone Star Five's orchestra, Ray Ozden, manager; 8:30-9:30, musical, Dean Paul Van Katwijk, director; 11-12, Pete Pale, Bud Morgan.
WGN, Chicago, Ill. (370.2), 7-8 p. m., organ recital, Blackstone string quintet; 8-9, R. H. L. in Line night; 10-11, Don Bestor Drake dance orchestra.
WGST, Atlanta, Ga. (270), 7-8 p. m., Mrs. Charles Bellinger, contralto; "Preparation for College Work," Hugh Harris Caldwell.
WHAS, Louisville, Ky. (399.8), 4-5 p. m., concert, Louisville Conservatory of Music; 7:30-9, Liberty Insurance bank concert.
WHB, Kansas City, Mo. (365.6), 2-3 p. m., ladies' hour, Gilbert Jaffey, director; 7-8 men's and boys' hour; 8-10, special broadcasting night.
WHO, Des Moines, Iowa (526), 7:30-9 p. m., Hawkeye orchestra, I. U. Duffus, director; 11-12, Gail Fitch and his dance orchestra.
WLS, Chicago, Ill. (344.5), 6-25 p. m., Ralph Emerson, organist; 6:50, Senate theater studio; 7, lullaby time, Ford and Glenn; 7:20, Howe's concert ensemble.
WLW, Cincinnati, Ohio (422.3), 6 p. m., dinner hour concert; 10, three-minute message, Civil Service department, United States government; 10:05, Cooper corporation, program; 10:15, Stoen, director; male quartet; springtime program; Deberry Melody boys.
WQAI, San Antonio, Texas (394.5), 9:30 p. m., dance program, Jimmie Joy's Hotel St. Anthony orchestra.
WQAW, Omaha, Neb. (526), 5:45 p. m., public news period, Eugene M. Konecky; 6, child's story hour, Grace Sorenson; 6:20, music; 6:45, Randall's Royal Pamphlet orchestra; program; 7:30, Auto Electric and Radio corporation, Frank Beckingham, director; 10, to be announced; 10:30, Frank W. Hodek, Jr., and his Nightingale orchestra.
WQC, Davenport, Iowa (483.6), 7 p. m., program from WEAF; 11, Louis Conner and his LeChaire hotel orchestra; 11:15, Malie and Stept.
WORD, Batavia, Ill. (275), 8-10 p. m., musicale.
WQJ, Chicago, Ill. (447.5), 3-4 p. m., "Springtime Is Green-time," Helen Harrington Downing; "Easter Hats," Mrs. Lillian Russell; 7-8 dinner concert, Ralph Williams and his Rainbow Garden orchestra; Mrs. Lydia Lochner, contralto; Blanche E. Robinson, pianist; Mildred Perlin, reader; 10-11, Ralph Williams and his Rainbow Skylarks; Verdi trio; Lew Butler, Glimp of Radio; Ned and Ches; Marie Wright, soprano; James J. Whalen, tenor; Axel Christensen, monologist; 1-2, Hotzy Tooty hour, Ralph Williams, the Olingerman Little Skylarks.
WSB, Atlanta, Ga. (428.3), 8-9 p. m., Tuckers' entertainers; Eugenia Holland, pianist; 10:45, Dr. Charles A. Sheldon, organist.
WTAS, Elgin, Ill. (302.8), 7-12 p. m., Boss' Own orchestra.

Mountain Time Stations

CJCA, Edmonton, Can. (516.9), 9-11 p. m., Izloo Hut meetings.
CNRC, Calgary, Can. (434.5), 9 p. m., Aeolian quartet; David Morgan, tenor; George MacBeth, bass; C. A. Davis, pianist; J. T. Dunn, violinist; M. W. Gill, flutist; H. B. Davis, cellist.

Pacific Time Stations

KFI, Los Angeles, Calif. (467), 6:45-7 p. m., radio-lecture, Dr. Arthur Storm of Y. M. C. A., "Handball and Health"; 7:30-8, Maude Reeves Barnard, soprano; 8-9, program, Standard Oil company of California, presenting a musical traveling troupe through San Juan Capistrano mission; 9-10, Aeolian string trio in classical recital; 10-11, Examiner, Betty the Shopper.
KFOA, Seattle, Wash. (384.4), 6:45-8:15 p. m., Sherman, Clay & company program; 8:30-10, Seattle Times program; 10:05-11, Eddie Barkness and his orchestra.
KGO, Oakland, Calif. (361.2), 4-5:30 p. m., concert orchestra, Hotel St. Francis; 7:15, golf lesson, Joe Novak; 8, "Pierre of the Plains," KGO players; 10-11, Henry Halstead's orchestra.
KGW, Portland, Ore. (491.5), 5 p. m., children's program; 8, Oregonian concert orchestra; 10, Multnomah Hotel Strollers.
KHJ, Los Angeles, Calif. (404.1), 6-6:30 p. m., Art Hickman's Biltmore hotel concert orchestra, Edward Fitzpatrick, director; 6:30-7:30, little stories American history, Prof. Walter Sylvester Hertzig; Dickie Brandon, screen juvenile; 7:30, "Art," Harold Swartz; 8-10, program, John Wright the tailor, arranged by the Prince of Jazz, Charlie Wellman; 10-11, Art Hickman's Biltmore hotel dance orchestra, Earl Burnett, leader.
KNX, Hollywood, Calif. (336.9), 6:15-7:30 p. m., Ziegler's orchestra, courtesy L. A. County Ass'n. of Osteometrists; 8-9, program, Dyas corporation; 9-10, KNX feature program; 10-11, Abe Lyman's Coronant Grove dance orchestra from Ambassador hotel; 11-12, popular song recital by June Purcell, the KNX girl.
KPO, San Francisco, Calif. (420.3), 4:30-5:30 p. m., Rudy Selger's Fairmont Hotel orchestra; 5:30-6:30, children's hour stories; 7-7:30, Rudy Selger's Fairmont Hotel orchestra; 8-9, Theodore J. Irwin, organist; 9-10, May Clarke Burns, soprano; 10-11, Gene James' Rose Room Bowl orchestra.

Friday, March 27

Friday, silent night for: AT5, CHNC, KFKU, KFKX, KFMQ, KFMX, KFUO, KGO, KSD, PWX, WBBR, WCB, WEAD, WEBW, WFI, WGST, WHAZ, WIP, WKAQ, WLBL, WLW, WQAI, WOI, WRC, WSAC, WSAI, WSAU.

Eastern Time Stations

CNRA, Mendon, Can. (312.3), 7:30 p. m., A. M. Bell, soprano; Andrew and Ward Stewart, pianist; Clyde Parsons, baritone; James Gibson Davis, violinist; A. M. Bell, soprano; Ward Stewart, pianist; James G. Davis, violinist; Rainbow Melody Boys.
CNRT, Toronto, Can. (356.9), 6:30 p. m., Lucile Romanelli and his King Edward hotel concert orchestra; 8:30, choir, Trinity Methodist church; Eva Madeline Goodman, organist; 10:30, Lucile Romanelli and his King Edward hotel dance orchestra.
KOKA, Pittsburgh, Pa. (309.1), 7:30 p. m., Radio Rhythmer and his rhytming machine; 7:45, "What the Dollar Earns Interest," Alexander Dunbar; 8:15, "The Prevention and Relief of Heart Disease," member of the staff of the School of Medicine; 8:30, program, Reiter-McJunkin company.
WAHG, Richmond Hill, N. Y. (315.6), 8-8:15 p. m., Edwin Lloyd, violinist; 8:15-8:30, Walter J. Neff, baritone; 8:30-9, M. Lambert, cellist; 9-9:15, Mildred Nash Carrington, soprano; 9:15-9:30, Utopia brass quartet; 9:30-9:45, Edwin Lloyd; 9:45-10, Mildred Nash Carrington; 10-11, Utopia dance orchestra.
WCAE, Pittsburgh, Pa. (461.3), 8:30 p. m., dinner concert, William Penn hotel; 8:30, concert, professional studios, Mme. Leila Wilson-Smith.
WCAU, Philadelphia, Pa. (278), 6 p. m., Hotel Pennsylvania concert orchestra; 10, Paul Scheff's dance orchestra; 11, Cafe Pandora revue.

WCX, Detroit, Mich. (516.9), 4:15 p. m., musical program; 6, dinner concert, Book-Cadillac Hotel; 8:30, musical program; 9, program, Standard Oil company of California, presenting a musical traveling troupe through San Juan Capistrano mission; 9-10, Aeolian string trio in classical recital; 10-11, Examiner, Betty the Shopper.
WDFW, Providence, R. I. (440.9), 8 p. m., lectures and talks, faculty of Brown university.
WEAF, New York, N. Y. (491.5), 6-7 p. m., dinner music from Waldorf-Astoria; 7-7:30, fish talk, H. C. Smith; 7:30-7:45, children's stories; 7:45-8, Jocelyn Clarke, contralto; 8-8:30, Happiness Candy boys; 8:30-9, W.E.A. Light Opera; 9-9:30, Gladys Gavreau's orchestra; 9:30-10, Walter Haediger, concert pianist; 10-11, Fredrick hour; 11-12, Meyer Davis' Lido Venice orchestra.
WEAO, Columbus, Ohio (293.9), 8 p. m., program, Ohio Penitentiary inmates; J. E. Mutschmann, pianist.
WEAR, Cleveland, Ohio (389.4), 7-8 p. m., Austin J. Byrle and his orchestra; 8-8:30, Tadmore Shrine band; Mrs. Yolande Suarez, soloist.
WEBJ, New York, N. Y. (233), 7-7:15 p. m., Ora Marsh, blind organist and singer; 7:30-7:45, Philip Kramholta, trainman tenor; 8-8:15, classical songs, Edith Lav; 8:15-9, Hotel Seville orchestra.
WEEI, Boston, Mass. (475.9), 6:30 p. m., Big Brother club; 7:15, Elliot Daniel, pianist; 7:30, program, "Whispering Willows," 8, Neopolitan musicale; 8:30, All Saints' choir; 9-9:30, musicale.
WFI, Philadelphia, Pa. (394.5), 3 p. m., Charlotte Sullivan, soprano; 6:30, Meyer Davis' Bellevue Stratford concert orchestra; 7, bedtime stories.
WGBS, New York, N. Y. (315.6), 6-6:30 p. m., Uncle George; 6:30-7, Larry Funk's orchestra; 7-7:15, Radio Playboys; 7:15-8, Herman Bernard; 11-12, Larry Funk's orchestra.
WGR, Buffalo, N. Y. (319), 6:30-7:30 p. m., Buffalo Trust company's dinner hour music; 8-8:15, address, "Physical Education of the Child," Carl Burkhardt; 8:15-8:30, recital, Minnie Clemens Stein and associates; 9-10, Astor Coffee orchestra, juvenile vocalists; 10-10:30, Dan Greig; 10:30-11, a. m., supper-dance music, Vincent Lopez' Hotel Statler dance orchestra, Harold Giesler, director.
WGY, Schenectady, N. Y. (370.5), 7 p. m., Albany Strand theater orchestra; 7:40, program, Remington Typewriter band, Edwin L. Daniels, director; Elizabeth M. Daniels, soprano; 10:30, Remington Typewriter band, Edwin L. Daniels, director; Elizabeth M. Daniels, soprano.
WHN, New York, N. Y. (361.2), 6:30-7 p. m., violin solos, Oleott Valt; 7-7:30, Harry Richmond and his entertainers; 7:30-7:35, health talk, Dr. Lamila; 7:35-8:05, George Olson's music; 8-05-8:15, fashion chats, Mine Belle; 8:30-9, Dave Harmon and his Clunderella orchestra; 9-10, Dan Greig; 10-10:30, Gladys Gavreau's orchestra; 10:30-10:35, "Storage," Barterite; H. B. Shotts; 10:30-11, Roseland dance orchestra; 11-11:30, Everglades revue with Ethel Waters; 11:30-12, Club Alabama orchestra; 12-12:30 a. m., Parody Club revue with Cliff Edwards.
WIP, Philadelphia, Pa. (508.2), 7 a. m., setting-up exercises; 10, men's club, Anita B. Scott; 11, m. m., Gladys Gavreau's orchestra; 3, recital, students Frank Oglesby studio; 6:05, songs, Artie Fletcher; 7, Uncle Wip's bedtime stories.
WIAR, Providence, R. I. (305.9), 8 p. m., musical program from our studio; 9, Astor Coffee orchestra; 11, Providence Biltmore hotel orchestra.
WJY, New York, N. Y. (483.2), 8-9 p. m., "New Discovers for Old," Glenn Frank; 9:30-9:45, Leon Carson, tenor.
WJZ, New York, N. Y. (454.3), 7-7:30 p. m., Savarin ensemble; 8-8:10, Wall Street Journal review; 8:10-8:20, "Man's Place in Nature," N. Y. U. air college; 8:40-8:55, Leslie Joy, baritone; 9-9:10, Jack Cohen, pianist; 9:10-9:15, "Chinew Music," Harriet G. Paley.
WLY, Philadelphia, Pa. (394.5), 7:30 p. m., Dream Daddy's bedtime stories; 8, Philomed ladies' quartet; book review; Sam Winfield's humor talk; 10, "Sham Arcom," three-act drama; 11, Philadelphia Elks' hour, direction Artie Blitton; Morning Glory club concert.
WMBF, Miami Beach, Fla. (384.4), 10-2 a. m., Nautlius hotel orchestra; Rosokorok Radio concert.
WNYC, New York, N. Y. (526), 7:35-7:45 p. m., resume of meeting of board of estimate; 7:45-8:45, dance program; 9-10, German music hour; 10-10:20, "Books That Everyone Should Know," Professor J. G. Carter Troop.
WOD, Philadelphia, Pa. (508.2), 7:30 p. m., A. Candler's concert orchestra; 8, WOD concert orchestra; 9:05, concert, Mary E. Vogt; 10:30, Vincent Hizzo's dance orchestra.
WOR, New York, N. Y. (405.2), 7:30-8 p. m., Commanders orchestra; 8-8:30, Somerville male chorus; 9:30-10:30, Radio Congress of United States; 10:30-11, Ben Fricman entertainers; 11-12, Ciro orchestra.
WPG, Atlantic City, N. J. (299.8), 9 p. m., Ambassador hotel, hostessianal bouquet, Samuel L. Leda, speaker; Hon. George E. Silzer, Governor of New Jersey; 11, Paul Whitman's Hotel Traymore dance orchestra.
WRED, Lansing, Mich. (283.5), 1-2:30 a. m., Buell's Melody entertainers.
WTAM, Cleveland, Ohio (389.4), 6-7 p. m., Guy Lombardo and his Royal Canadians.
WWJ, Detroit, Mich. (352.7), 8 p. m., Detroit News orchestra; 9, dinner concert; 8, Detroit News orchestra; 9, Jean Goldkette's Victor Recording orchestra.

Central Time Stations

CKY, Winnipeg, Can. (384.4), 7:30 p. m., university lecture; 8, Northern Electric company's concert; band, Princess, Pal's Canadian Light infantry.
KFAE, Lincoln, Neb. (249), 7:30-8 p. m., Ufiza, Nebraska band; talk, Paul Dodd; Troubadours, entertainers; Mrs. William Nelson, soprano; old-time orchestra.
KFNF, Shenandoah, Ia. (265), 6:30 p. m., program, Radio & Electric company; 8:30, program, High school and Community club, Elliot, Ia.
KSAG, Manhattan, Kan. (347.7), 7:30 p. m., college quartet; 7:30, "Tuberculosis from Milk," A. C. Fay; 7:30, college quartet; 7:30, "Fourth Claimant," Spurrier.
KTHS, Hot Springs National Park, Ark. (374.8), 8:30-8 p. m., Little Rock artists, Mrs. Robert A. Craig, director; Sara Tenenbaum, violinist; Henry Pinkbeler, bass; 9-9:30, Meyer Davis' New Arlington ensemble; 9:30-10, Little Rock artists.
KYW, Chicago, Ill. (535.9), 7 p. m., concert, Congress hotel; 9-1 a. m., midnight revue; 1-2, Inasmuch club; Con-Sanders Original nightbirds.
WBAP, Fort Worth, Tex. (475.9), 4 p. m., educational lectures, Peter Molynaux; 7:30-8:30, Hood County male quartet; 9:30-10:45, Fred Cahoon's orchestra.
WBCN, Chicago, Ill. (268), 7 p. m., popular program, Tom Owens' trio; Will Rowler; Big Boy Vagler; Casey and Gervais harmony duo; Dorothy Ferguson, girl xylophonist; Roy Miller, tenor; Midway orchestra; Peggy O'Neil, soprano; Joe Ward's Banjo Phidians, banjo sextet; Jack Little, Paul Small; 9-10, W. G. Teutmeier and company; 10-10:30, Midway dancing gardeners orchestra.
WCCO, Minneapolis-St. Paul, Minn. (416.4), 6:15 p. m., Biles' St. Paul hotel concert orchestra; Bernard & Robinson; 7:30, talk by John G. Ross; 7:45, health talk; 8, Bernard Street choir; 9, F. & R. family; 10, Frank's St. Paul hotel orchestra; Bernard & Robinson.
WCEE, Elgin, Ill. (275), 7-8 p. m., Boss' Own orchestra; 11-12, Fred Hamm, orchestra; Eddie Loftis.
WDAF, Kansas City, Mo. (365.6), 7-8 p. m., Star's Radio trio; 8-1, Tell-Me-a-Story Lady; Trianon ensemble; 8-10, popular program; 11:45-1, Merry Old Chief, Plantation players; Johnnie Campbell's Kansas City club orchestra.
WEBH, Chicago, Ill. (370.2), 7-8 p. m., Ortole orchestra; Cambridge sisters, violin trio; Riviera theater; 9-10, Ortole orchestra; Elmer Jordan and company; Jack Pennevell, guitarist; Ortole orchestra; Frederick Azard, tenor; Frank Pappis, accordion soloist; Sandy Meek, tenor.
WEMC, Barrien Springs, Mich. (286) 9 p. m., Radio Lighthouse choir; Cura Garber, pianist; Martha Hutchinson, soprano; Mrs. Leila Reschell, contralto; "The Christian Cook," Sherman T. E. Star.
WFAA, Dallas, Texas (475.9), 6:30-7:30 p. m., Paul Cretien and his banjo quartet; 8:30-9:30, Y. W. C. A. choral club, Mrs. R. H. Merten, director.
WGN, Chicago, Ill. (376.2), 6 p. m., organ recital, Lyon & Healy; 6:30-7, Drake concert ensemble, Blackstone string quintet; 8-9, Salvation Army band; 10-11, Don Bestor, Drake dance orchestra, Crispo quartet.
WHA, Madison, Wis. (535.4), 7-7:45 p. m., convocation address, Rev. Harry Emerson Fosdick.
WHAD, Milwaukee, Wis. (275), 8 p. m., Wisconsin theater weekly revue.
WHAS, Louisville, Ky. (399.8), 4-5 p. m., Louisville Conservatory of Music; Jack Little, Paul Small; 7:30-9, Southern Baptist Theological seminary, Rev. E. A. Burnett.
WHB, Kansas City, Mo. (365.6), 2-3 p. m., classical music, Gilbert Jaffey, director.
WHO, Des Moines, Iowa (526), 7:30-9 p. m., Stewart Watson, American baritone; Sara Helen Eaton, violinist; Grace Haffner, accompanist; Emma Keller May, soprano; Dorothy Dyer Everett, accompanist; Williamson brothers.
WLS, Chicago, Ill. (344.6), 6:30 p. m., Ralph Emerson,

organist; 6:50, Senate specialties; 7, lullaby time; 7:15, Seven Myral Sabramonists; 8, R. F. D. program, Ford and Glenn; 9, Glenn's Cornhuskers; 9:10, WLS theater; 9:30, Senate theater synopators; 9:45 Nulis Allan; 10, Senate Symphony orchestra; 10:15, Garrett quartet; 10:30, Glenn's Cornhuskers; 10:40, Ford and Glenn time.
WLW, Cincinnati, Ohio (422.3), 12:15 p. m., program, Harry Brunstater, orchestra; William Koch, director.
WQAW, Omaha, Neb. (526), 5:45 p. m., public news period, Eugene M. Konecky; 6, story hour, Doris Claire Secord; 6:20, to be announced; 6:50, Baxter's orchestra; 7, to be announced; 7:15, current spot events, Ivan L. Gaddis; 9, program, auspices Union Pacific Railroad company; 10, to be announced; 10:30, Brandeis Store restaurant.
WQC, Davenport, Iowa (483.6), 6:50 p. m., "Artes Washed Away," G. H. Hoffman; 8, "Can the Law Be Enforced," M. O. Christgau; 8:45, A. P. Griggs Music company; Malie and Stept.
WORD, Batavia, Ill. (275), 8-10 p. m., musicale, J. C. Seaton, Music company.
WOS, Jefferson City, Mo. (440.7), 8 p. m., "Missouri's Road Program," H. H. Piepmeyer; "The Peculiarities of Handling Stock Hogs in Missouri," Dr. Homer A. Wilson; original poems, Leltoy H. Kelsey; varied musical program, Hammond.
WQJ, Chicago, Ill. (447.5), 3-4 p. m., "Noah's Ark Parry for Children," Josephine Naylor; "Bride Lessons," Wynne Ferguson; "Jasper National Park," Mrs. Harry T. Sauer; 7-8, Ralph Williams and his Rainbow Garden orchestra; Henrietta Nolan, violinist; Otis Pike Jester, soprano; Mary Thrash House, pianist; 10-11, Ralph Williams and his Rainbow Skylarks; Rogers boys, Larry and Billy; West brothers; Royal Male quartet; Ziegler sisters; Lauretta Gies, soprano; Nate Caldwell, monologist; 1-2, Hotzy Tooty hour.
WSB, Atlanta, Ga. (428.3), 8-9 p. m., classic concert, Signor Emilio Volpi; 10:45, entertainment.
WTAS, Elgin, Ill. (302.8), 8-11 p. m., WTAS dance program.

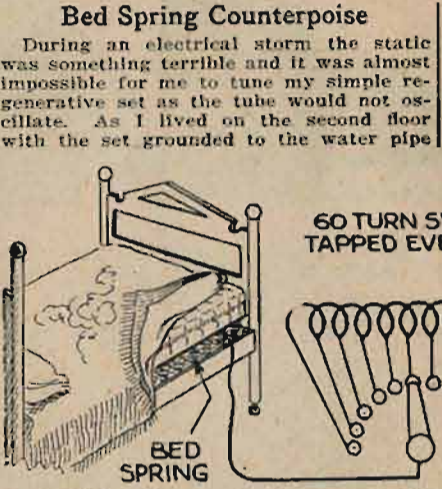
Mountain Time Stations

CNRE, Edmonton, Can. (516.9), 8:30 p. m., Three Hawaiian orchestras.
KOA, Denver, Colo. (322.4), 6:40 p. m., Book of

Knowledge; 8, Fred Schmitt and his Bialto theater orchestra; 8:10, KOA orchestra; Laddie Wood, 8-year-old pianist.
KOB, State College, N. M. (346.5), 7:30-8:30 p. m., popular science course, Dr. D. S. Robbins; "Lincoln and Mammoth National Forests," George H. Cook; Clifford Coble, violinist; Ila Coble, guitar auto harpist; Dean Coble, mandolinist.

Pacific Time Stations

KFAE, Pullman, Wash. (348.6), 7:30-9 p. m., thirty-fourth anniversary program; music, men's and women's glee clubs; string trio; talks, E. A. Bryan, O. L. Waller, Dr. Selon Sheild, Dr. Sofia B. Nelson.
KFI, Los Angeles, Calif. (467), 6:45-7 p. m., radio-lecture, Dr. D. S. Robbins; "Lincoln and Mammoth National Forests," George H. Cook; Clifford Coble, violinist; Ila Coble, guitar auto harpist; Dean Coble, mandolinist.
KGO, Oakland, Calif. (361.2), 3 p. m., studio musical program; 4-5:30, Hotel St. Francis orchestra.
KGW, Portland, Ore. (491.5), 10 p. m., Colburn's Melody men.
KHJ, Los Angeles, Calif. (Pacific, 404.1), 6-6:30 p. m., Art Hickman's Biltmore hotel concert orchestra, Edward Fitzpatrick, director; 6:30-7:30, little stories American history, Prof. Walter Sylvester Hertzig; Richard Headrick, child star of the screen, and Uncle John; 7:30, "The Santa Fe Trail," Gladys De Witt; 8-10, program, Wm. H. Hyatt, arranged by J. Howard Johnson; 10-11, Art Hickman's Biltmore hotel dance orchestra, Earl Burnett, leader.
KLX, Oakland, Calif. (508.2), 6-7 p. m., organ recital; 7:45-9:45, studio program; 9:45-10:30, Sweet's ballroom.
KNX, Hollywood, Calif. (336.9), 5:45-6:15 p. m., Wuritzer pipe organ studio, sports talk, Sid Ziff; 6:30-7:30, dinner hour music; 8-9, program, West Coast theaters, Inc., by remote control; 9-11, KNX feature program; 11-12, Abe Lyman's Coconut Grove dance orchestra from Ambassador hotel; 12-2 a. m., the Wuritzer Nightbirds orchestra.
KPO, San Francisco, Calif. (420.3), 4:30-5:30 p. m., Rudy Selger's Hotel orchestra; 8-10, Cleveland Six orchestra.



I attached a simple counterpoise to the ground terminal of my set and tuned in. The counterpoise consisted of a 60-turn spider web coil in the line run to the

bed springs. This gave me a nice control of the regeneration.—M. Harvey Merwin, Jensen, Fla.

Difficulties from Bent Wire Wire that has been bent is apt to break if an attempt is made to straighten

it out, and even if it does not break it will be weak where the bend occurred or, due to crystallization at this point, it may cause high resistance.

The New Radio Book HOW TO Operate Sets Construct Parts Improve Reception Understand Radio Assemble Circuits
The greatest assemblage of facts and hints, from actual everyday practice, ever gotten together. Edited by the technical staff of Radio Digest, it supplies the demand for a book covering every phase of Radio. Starts at the beginning with simple explanation of Radio reception, with technical explanations of the different parts and leads right on to the more advanced instruction. A complete handbook serving as a ready reference in the Radio field. It gives suggestions on parts and sets which will prove to be a money saver. Blue prints and diagrams are essentially an important part of this book. Special chapter is devoted on "How to Operate," which gives detailed information on the operation of many well known sets.
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How Many Turns of DSC. Wire Required?

Charts Eliminate Calculation

By David B. Arnold

CHART No 1						
WAVE LENGTH RANGE 190 TO 600 METERS						
C = 250 mmfd. = .00025 mfd.			L = 400 microhenries			
DIA. OF TUBING	3 INCHES		3 1/2 INCHES		4 INCHES	
GAUGE OF WIRE B&S D.S.C.	LENGTH OF WINDING IN INCHES	NUMBER OF TURNS	LENGTH OF WINDING IN INCHES	NUMBER OF TURNS	LENGTH OF WINDING IN INCHES	NUMBER OF TURNS
20	3.4	92	2.8	76	2.4	65
22	2.5	83	2.1	69	1.8	59
24	1.8	74	1.5	67	1.4	57
26	1.4	70	1.2	60	1.05	52
28	1.1	66	0.95	57	0.85	51
30	0.9	64	0.75	54	0.65	46

CHART No 2						
WAVE LENGTH RANGE 190 TO 600 METERS						
C = 350 mmfd. = .00035 mfd.			L = 290 microhenries			
DIA. OF TUBING	3 INCHES		3 1/2 INCHES		4 INCHES	
GAUGE OF WIRE B&S D.S.C.	LENGTH OF WINDING IN INCHES	NUMBER OF TURNS	LENGTH OF WINDING IN INCHES	NUMBER OF TURNS	LENGTH OF WINDING IN INCHES	NUMBER OF TURNS
20	2.55	69	2.15	58	1.85	50
22	2.0	66	1.65	54	1.5	49
24	1.5	61	1.25	51	1.1	45
26	1.05	53	1.0	49	0.85	42
28	0.85	51	0.8	47	0.67	40
30	0.65	46	0.6	43	0.54	38

IN THE previous article by the writer on this subject, published some weeks ago, it was stated that the frequency or wave length of an oscillating circuit was computed by the use of formulas, the factors of which were the wave length desired, the inductive value of the coil and the capacity of the condenser. The following article will give a more complete explanation together with examples.

The fundamental formula for determining the wave length of a given inductance and capacity is as follows:

$$\lambda = \frac{2\pi V}{\sqrt{\frac{1}{LC} - \frac{R^2}{4L^2}}}$$

in which λ = wave length in meters, π = (pi) 3.1416, V = velocity of light, 3×10^8 = 300,000,000 meters per second, L = inductance of coil, C = capacity of condenser, R = high frequency resistance of the circuit. This formula can be used

with different systems of units, one of which was shown in the previous article.

In most cases the factor $\frac{R^2}{4L^2}$ is so small compared to $\frac{1}{LC}$ that it can be ignored thus simplifying the formula to, $\lambda = 2\pi V \sqrt{LC}$. With the use of this formula we find

$$\lambda = 2 \times 3.1416 \times 300,000,000 = 1,884,960,000 \times \sqrt{LC}$$

but as this was derived from the fundamental units of inductance and capacity in which L = henries and C = farads, changing L to microhenries and C to microfarads gives us 1884.9 which for practical purposes can be read 1885 $\times \sqrt{LC}$ = wave length.

With a known capacity and wave length the formula to determine the inductance becomes,

$$L = \frac{\lambda^2}{1885^2 \times C} = L \text{ in microhenries}$$

and with known inductance and wave length,

$$C = \frac{\lambda^2}{1885^2 \times L} = C \text{ in microfarads}$$

Then, with a capacity of .0005 microfarads and a maximum wave length of 600 meters, the inductance required is found by,

$$L = \frac{600 \times 600}{1885 \times 1885 \times .0005} = \frac{360,000}{1776.6} = 202 \text{ microhenries (approx.)}$$

and by referring to chart number 2 we find this value is within 1% which for all purposes, excepting precision laboratory measurements, is allowable. It must be understood that in calculating the inductance value of a coil absolute accuracy

is impossible unless the experimenter has a thorough knowledge of mathematics. For those experimenters who desire greater accuracy, circular 74, a U. S. Bureau of Standard's publication, obtainable from the Supt. of Documents, Washington, D. C., will be found of great value.

The following simplified formula will be found to give sufficient accuracy for the designing of coils to be used in the reception of Radio broadcast:

$$L = \frac{(5 d n)^2}{1000} = L \text{ in microhenries}$$

Where L = inductance in microhenries, d = diameter of coil in inches, n = number of turns, b = length of coil in inches. By referring to chart number 1 we find that it takes 83 turns of number 22 dsc. wire, occupying 2.5 inches on a three inch

(Continued on page 20)

The Maker's Name-- A Public Promise

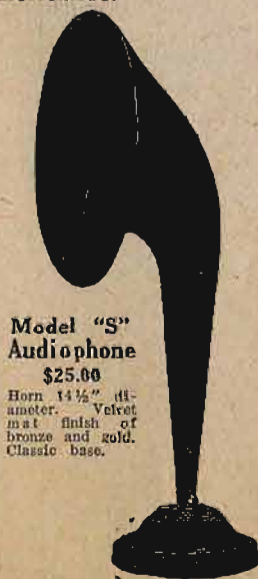
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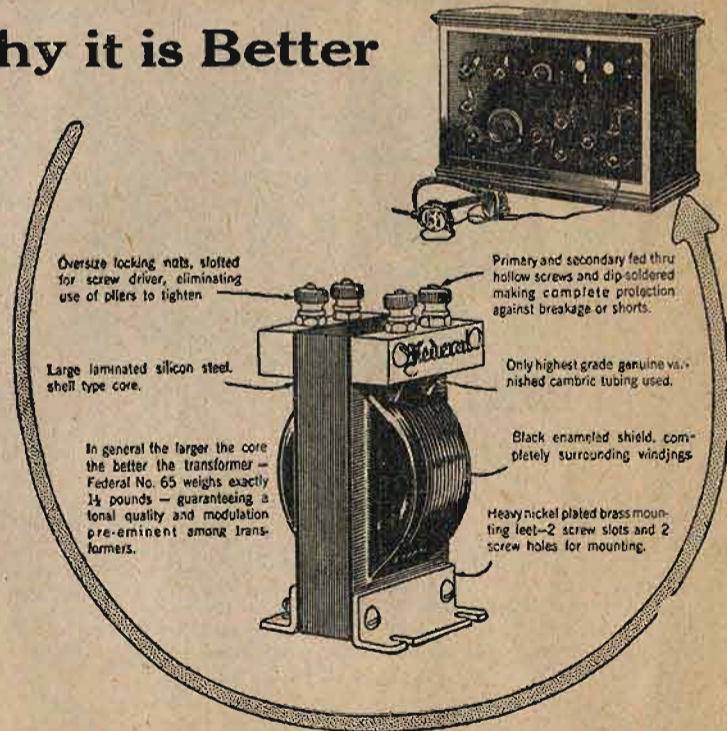
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Vol. XII Saturday, March 21, 1925 No. 11

Better Broadcasting Wanted

A GREAT deal of comment has been made on our recent editorial "Less Stations and Better Broadcasting." It seemed to strike the keynote of most fans. All have had the same trouble since our high officials began to tinker with the wave lengths. Thousands of listeners have been keeping a log of the different Class B stations for several years. This log is now of no use to them. Almost all the good program stations have had to change their wave lengths to suit the whim of some understudy in the official offices. One of the pioneer stations has been run for years on 326 meters and now it is changed to 309 meters. This inconsistency prevails everywhere. If a business manager should handle his business in a like manner it would be called a business suicide.

A letter from one of our readers says, "I have two sets now, one a five tube which worked fine before they began to monkey with the wave lengths, but when they began to broadcast on half meters they put the machine out of business. A five tube neutrodyne was purchased and it worked fine up to two or three weeks ago when they again began to monkey with the air and now it is difficult to tune in on many stations without getting the cross-fire of some other station. Many of the stations should be stopped or else the wave lengths should be placed farther apart. A lot of stations should be cut out anyway for they only spoil the fun."

The secretary of commerce seems to have specified a certain wave length for a broadcasting station and then forgot about it, as a great many of the stations run on almost any wave length that suits their convenience, and why not? There is no person holding any official position for checking them up. The old broadcasters appear to be disgusted and they let things run along haphazard.

Another reader says, "Have you any suggestions to make or can you enlighten us as to the cause of all this tomfoolery?" The whole science has been an experiment and there seems to be no end to it, as controlling heads do not know where to stop, or what to do for the fear of offending somebody. What we need is more of the old time "big stick," and that, too, swung by a fearless commander.

Inauguration by Radio

FORMERLY all notables began their quadrennial trip to Washington to attend the inaugural ceremonies on March 4th. In the early days news traveled slowly and at one time it took weeks for those in remote districts that could not attend in person to learn about what was said and done. Very few pictures came from the capital that would convey to the eye just how things looked down at Washington where these notables took the oath of office, the military parade and the society events following the day's ceremonies.

Time changed things and each inaugural had something new to boast about of which science gave to the world. The new president could be seen in still pictures, his speech could be sent by the press and letters, then actions in motion pictures and the address by telegraph and by telephone became possible.

This year was the first inauguration that speech from the new president could be heard anywhere in the land to all who owned a Radio set. Science has caused all this to happen within the four intervening years. What will happen in the next four years remains to be seen and no person is able to prophesy what will be accomplished. If the same rate of speed in invention is carried on as it has been in the past few years then we can expect much. Perhaps we will be able to see the new president and hear him talk while sitting at our fireside at the other end of the continent.

The average citizen is becoming better acquainted with his government and with the men who administer it, even the highest officials. The humble citizen used to hear, to see, perhaps once in a lifetime, a president or other high officials. Now it is possible to listen in almost daily to some government executive of first rank.

RADIO INDI-GEST

Latest Report from the "Kanoofis"



Word has been received here that the expedition will arrive next week at the beautiful little island of Walla Walla. Be sure to get your copy of Indi-Gest, and read the beginning of the history of this island. It will be told by Chief Kokomo, famous for his ability to hunt heads.

The Chief boasts of owning and possessing at least three hundred dried heads, representing years of hard work and dodging of spears. His daughter, Shaka Little, will head the reception committee which will welcome the interpid adventurers when they arrive at the island.

Shaka is an oscillatory dancer, and the belle of the tribe. She is known from one end of the Pacific to the other. Her ability to dance is the topic of conversation at all the clubs in Pago Pago, Papette, Tahiti, Samoa and Fiji. She will be one of the star performers at our station when it is opened, and we will endeavor to obtain a photograph of this young lady so that you may have it for your albums.

Dear Indi: Good news, maybe. I believe I have heard from the now famous Walla Walla expedition on board the S. S. "Kanoofis." Last night while I was tuning my super Radiofotoscope set I heard a series of very damp waves and then got a glimpse of the enclosed foto. Because of static it is very dim. It seems they had a very large wash out but we will probably hear from them again as soon as things dry out. Yours,
H. AMPER.

The Dutchman and His Radio

As we travel to and fro
From WEEI to KGO
It vos bully gud fun
Tuning in mit dot Radio.

Ting-a-ling ling!
Coming in loudt and clear
Broadcast by vun gud hired man
Mit dot old cow's lavalier.

Tooty-toot toot! Ve are off!
Youse get not vun guess
It's a Tudor Fordson
Down by WLS.

Dundervetter! Dot vos Blueyed Sally
Mit a googly eye.
She youst land in California
By dot Station KFI.

In dot leddle round uv miking
Near the end of dot day.
It vos dose Vestinghouse Band
By KDKA.

Und in dot journey southward
Vay down by dot sea
It fun mit dose Pickanins
Sure! It vos WSB.

Now—if dot spine is outt of kilter
You vill surely Vest
Where dose great Vest begin
Und dot sidwalk he ends.

HANS.

But This Is Their Last First Appearance

Dear Indi: This "first appearance" evil has gotta be stopped. We learn, as the latest offense, that Mary Pickford, Douglas Fairbanks and Charles Chaplin again made their microphone debut at the opening of Warner Brothers' Hollywood station, KFWE.

Charlie, Mary and Doug may have forgotten, but all three have made broadcast appearances (plural) before.

These notables seem to be gluttons for first appearances. If Charlie doesn't hurry up his first appearance record will surpass his number of matrimonial ventures and wrecks.

The proverbial society Miss who made a debut every year till she passed forty, is nonplussed and mad as a wet hen. The silver-sheet stars have her skinned a mile.

Let us provide each movie actor with a correspondence memory course every time they make a "first appearance."

GLOOM OOZER.

Radio Reactions

(Continued from last week)

Then that song, "Sweet Little You."
Makes self-conscious, Sister Sue;
Guess she's heard that verse before,
Also closer home I bet,
'Cause I noticed in her ring
There's a little crystal set.

When I tune for distance, Dad
Waxes super-het and mad;
So I have to give it up
Just to please the folks, you know.
What's my fav'rite piece, you ask?
"This is Station 2LO!"

HORACE GRADY MOORE

Our Next Door Neighbor



Condensed

By DIELECTRIC

I am not sure of the spelling of a certain lady violinist's name who played most agreeably from the studio of WSAI, Cincinnati, though it sounded like Miss Edith Tolken. Her playing sounded like one with musical devotion intelligently cultured and would please her unseen audience with more of it. Mediocre performers will soon find their audiences demanding the best—as they do outside Radio concerts.

Groups of popular songs came from out the cordial atmosphere of the studio of WEBH, Chicago. If I start to comment on this station, it will simply lead to a eulogy on Mr. Boniel's manner before Mike. No unnecessary waits for the listeners, always an agreeable voice and intonation and, to the deaf especially, clear announcing of WEBH. Both songs and singers, the other evening, were well chosen.

Whenever you feel a little blue from whatever cause—domestic, atmospheric, B+ to A, etc.—take a swing around to WCX, the Detroit Free Press station, and introduce yourself to the Red Apple Club. No more melancholia for you for awhile! The other night Robert Bruce sang the "Big Bass Viol" with a voice suited to the song. Fun all the time.

For variety in programs you will find no station to excel WOAW, at Omaha, Neb., although some nights present more of it than others. Talks, all sorts of musical entertainment, sermons of distinction, form some of the features to be heard. I happened in when a lady was "following the swallow" (whether back home or not, I don't know) with the usual orchestral accompaniment. The piece may be familiar!

Much of the chilly atmosphere of the Eastern Penitentiary was absent the other evening when a concert was given through WIP, Gimbel's Philadelphia station, to us listeners in. In fact, the only drab note in the entertainment was the introductory announcements: "Numbers 2311 and 2312 will dance for your approval." And those feet surely did rhythmically tap the prison floor! Then No. 510 sang "Sunrise and You."

Very soon the whole of the United States will be privileged to listen to the concerts by Victor artists emanating from the studio of WEAJ, New York city. Most vocal students would find in the singing of both Miss Dal Monte and Mr. De Luca, much to observe. Certainly the rest of us appreciated so generous a display of rare artistry.

Perhaps someone can explain to me the psychology behind Radio broadcasting enough so that I can understand why so many stations broadcast new and untried brass bands. Station managers generally require a rehearsal or tryout before allowing any performer to appear before their microphones but they seemingly toss all caution to the winds when a band is offered them. Los Angeles suffered for months while the Silver Band of KFSG was being organized and the blue notes of several other amateur bands have been heard since in spite of the experience. In fact, announcements from two other Los Angeles stations seemed to take pride in the fact that they were presenting musical organizations less than a month old and made comments upon the fine progress made in that time. Personally I am inclined to believe the public would rather have such bands stay off the air until the time when they can render at least one selection correctly.

Four Filter Eight Tube Super-Heterodyne

Part III—Filter Cover and Oscillator Coil

By Jacques Fournier

IN THE second article, printed last week, we presented instructions for winding the filter transformers and gave the detailed layout for the filter box. The builder now has his choice of two types of oscillator coils; the oscillator can be either a low loss, basket weave type which was used by the writer or can be the closely wound variety on a bakelite or hard rubber tube. The construction of the low loss type will be taken up first.

The Winding Form

The form for winding this coupler is shown clearly in figure 7. As will be seen in that figure, a square block of wood, bakelite, hard rubber, or metal is necessary, 4 inches on a side and from 5/8 to 1 inch thick. A circle is drawn in the center of this, 2 3/4 inches in diameter and

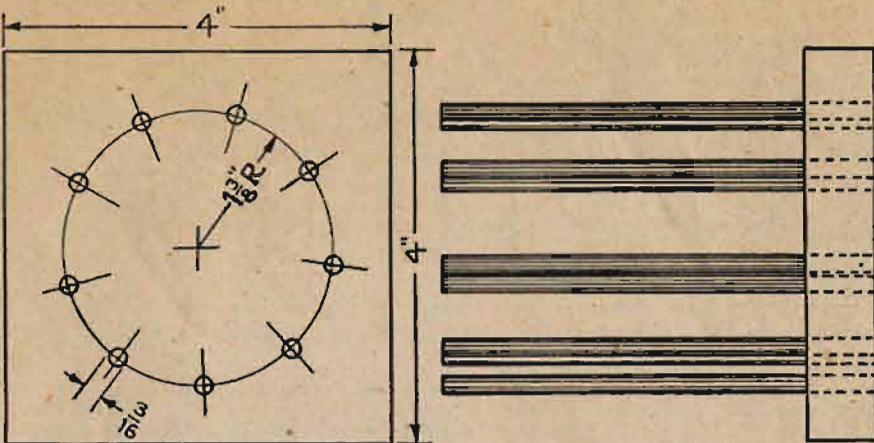


Figure 7

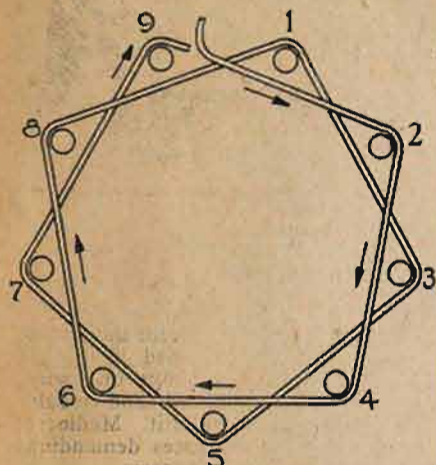


Figure 8

divided into nine parts so that the holes will be drilled 40 degrees apart around the circle. In the inductance which we are going to build, the one-over, one-under method of winding is used. The rods on which the wire is wound may be either large nails or wood dowel pins as shown,

and should be 3/16 inch in diameter and 5 inches long. If metal pins are used they can be soldered to the metal block which forms the base; if wood pins are used they can be glued to the wooden base; or if metal pins are used with a bakelite or hard rubber base, they can be put in by making the holes a little smaller and driving the pins through.

One-Over, One-Under

The method of winding is shown in figure 8. As will be seen, the wire passes inside of pin 1, outside of 2, inside of 3 and outside of 4. Since there are an odd number of pins, the second turn will go over the outside of the pins on which the first turn runs inside. Seventeen turns are wound in this way and these form the pick-up coil of our oscillator. At the seventeenth turn make a large loop in the wire so it will not loosen. Resume winding and add 29 more turns, which will be the plate or feedback winding. Twist another 6-inch loop and add 68 turns, for the grid coil. The wire used is to be number 20 double cotton covered. Using this number 20 wire, wound as shown,

the length of the pick-up coil will be 5/8 inch, the plate coil will be 1 1/2 inch and the grid coil 2 3/4 inches. Each coil is to be held together with heavy thread, preferably waxed, and the method of holding the wires in place on each coil with one continuous piece of thread is shown in figure 9.

Securing with Thread

The alternate turns cross each other diagonally at 9 points around the coils and it is at these 9 points that the thread holds the turns together. Following the thread in figure 9, it will be noted that it runs across to the left under the odd turns, around the end of the wires, and then under the even turns and over the odd turns to the opposite end of the coil where it passes around the last turn and comes back under the odd turns and over the even turns. Thus the thread forms one complete loop and is carried across, as denoted by arrows, 9, 10, 11, 12 and 13. When the thread has been carried entirely around a coil in this way and the ends tied together the coil can

be slipped from the form by slightly squeezing the pins together at the free ends and slowly sliding the coils from the pins. The 6-inch loops connecting coils should, of course, be cut.

A strip of bakelite or hard rubber is now cut as shown in figure 9 and measures 5 1/2 inches long, 1/2 inch wide and 3/8 inch thick. Holes are drilled 3/16 inch from each end. Before slipping this piece of bakelite through one of the points on each of our 3-pointed star coils, it would be well to smooth off the corners with a file so that the insulation on the coils will not be injured.

Another Type of Oscillator

The home builder who does not care to go to the work of constructing a low

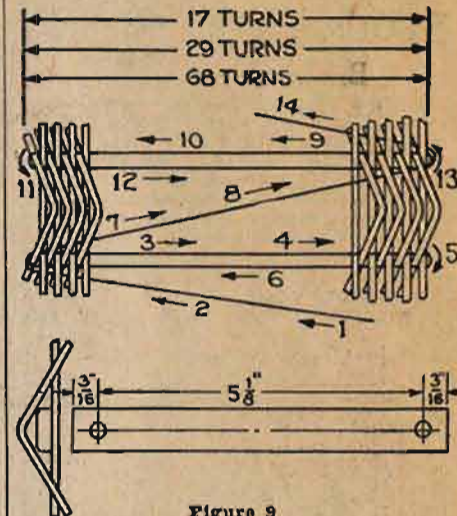


Figure 9

loss winding form and the tying together of the coils can construct one on a solid tube and the results will be practically the same as if the low loss coil (Continued on page 18)

EXIT INTERFERENCE

WELCOME SELECTIVITY

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Dunbar, West Va.
Ferbend Electric Co.
Gentlemen: I bought your Wave Trap to see if I could not cut out the awful noise of a nearby station which ruined most of our programs. Since we installed it in our five-tube Teds Neutrodyne set we have not heard any more interference—we let you be sometimes to show our friends how easy it is to kick 'em out with the Wave Trap. I would not have a set without a Ferbend Wave Trap.
(Signed) H. E. Atherton

Farmington, Iowa.
Ferbend Electric Co.
Dear Sirs: I set my radio where Havana, Cuba, should come in but received only a jumble of K.F.N.F., W.O.R. and W.L.A.G. I then tuned in with the Trap and had Havana for two hours. I have several times taken a jumble like this and separated five and six stations. I find it a great help in cleaning up stations that can not be brought in direct. I am using a Crosley X-1.
(Signed) W. Y. Cox

Towson, Md.
Ferbend Electric Co.
Gentlemen: Well to say I am pleased with the Trap is putting it mildly. It is simply a wonderful instrument. I have had more or less trouble in getting K.D.K.A., W.B.Z., W.D.R. and W.L.W. with my Freed-Eismann Set as they are only a few degrees apart on my dial. Your Trap has me through with the clearest possible reception. In my candid opinion there is no Radio Receiving Set complete without the addition of the Ferbend Wave Trap.
(Signed) E. W. Stevenson

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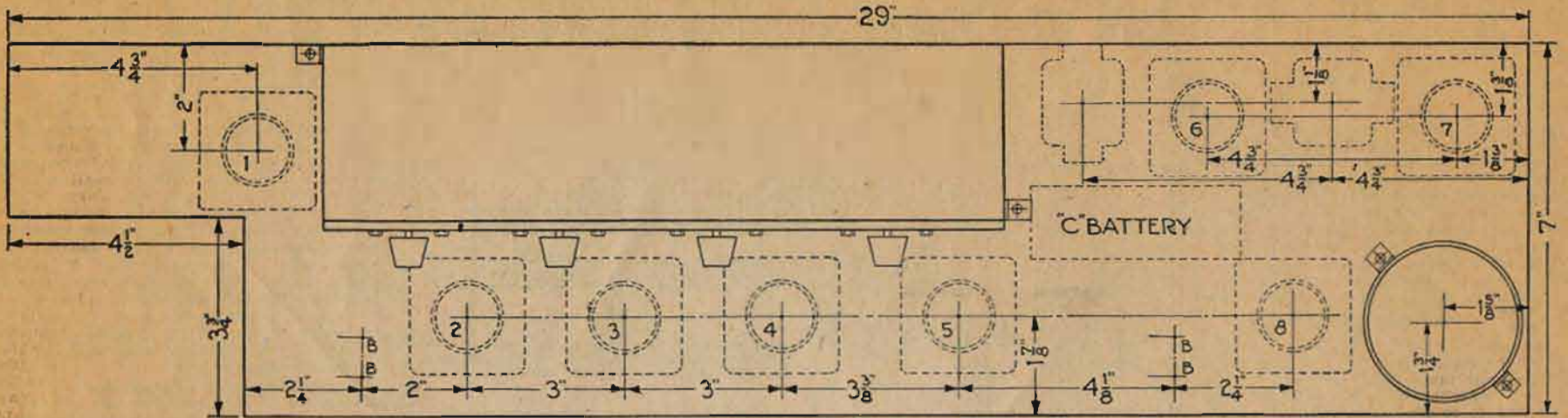


Figure 11

FOUR FILTER SUPER

(Continued from page 17)

were used. The difference between the two types of oscillator is interesting to the engineer, but the improvement in the low loss type would probably be imperceptible to the fan. The tube used should be 3 inches in diameter and 5 inches long with a 1/16 or 3/32-inch wall. The three windings are to be wound in the same direction using number 22 double cotton covered wire. The pick-up coil is put on first and should be started 1/4 inch from the end of the tube and 14 turns are put on. A space of 1/2 inch is left

cover is made from a piece of 1/8-inch bakelite or hard rubber measuring 5 by 13 inches. The four holes on a horizontal line just below center are for the threaded brass rods on which the filter transformers were assembled. In constructing these transformers it was pointed out that 1/2 inch was to be left for mounting to the cover and this short length is inserted up through the holes, one of which is marked A. Near the top of the illustration are four more holes on a horizontal line, one of which is marked B. These are for the shafts of midget condensers or to pass a screw driver when adjusting microdensers. The

through the holes in the cover for the location of the holes on the flange. When these have been drilled, short machine screws with round heads are to be inserted upwards through the flange and soldered in position. The cover can then be set in place and the 16 machine screws will project upwards through the holes in the cover and nuts may be placed on these screws.

The layout for the baseboard shown in figure 11 will now be taken up. Center points only are indicated for the tube sockets and audio transformers as the exact location for the mounting holes will vary with different makes of apparatus. This layout is to be enlarged to full size and pasted or clamped to the panel used as a sub-base. The various units can then be placed in position and mounting holes marked. Socket 1 at the left end of the sub-base is the first detector, sockets 2, 3 and 4 are the intermediate amplifiers, socket 5 is the second detector, 6 and 7 are the push pull amplifier, while socket 8 is the oscillator. The variable condenser which tunes the loop will, when it is mounted on the panel, project over the spaces in front of socket 1 and to the left of socket 2. The variable condenser which tunes the oscillator will project over the blank space to the left of socket 8.

The bracket holes are indicated by the

letter B and no dimensions have been given for them as they will vary with the brackets used. These brackets should be unusually heavy and preferably of 1/4-inch brass about 1 inch wide, with about 2 inches to project upward on the panel and 3 inches underneath the sub-base.

Here the writer wishes to mention an interesting point that has come up since this series started. Two of these receivers were shipped to a point at which conditions were the opposite of those found in Chicago. A town was chosen where there were no stations within several hundred miles. Both sets were built exactly according to the layout and circuit shown, but one used five-volt tubes while the other required three-volt tubes.

The set utilizing the 201-A tubes had everything desired in range, clearness and volume, but the set using tubes of the 199 class did not have quite the volume desired. Range and clearness were there, but the step up ratio of push pull transformers and the lesser amplification of the smaller tubes were insufficient. This set was accordingly altered by putting in 4 to 1 and 3 to 1 transformers, making two stages of audio; volume was then all that could be desired. The ratio of push pull transformers is usually but 2 to 1. In the next article the writer will give the

(Continued on page 20)

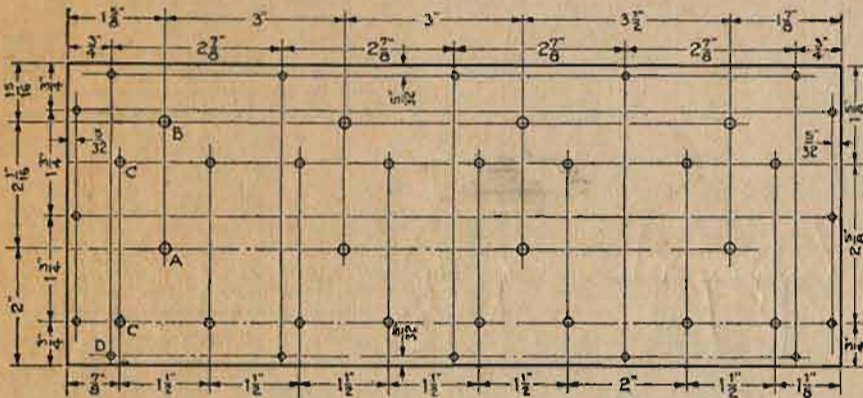


Figure 10

and then 25 turns are put on for a plate coil. The third is to be started 3/8 inch from this plate coil and consists of 55 turns. This will leave about 3/4 of an inch at the upper end of the tube. This coil is shown in the lower right hand corner of figure 11, which is the layout for the sub-base. If the low loss type of coil is used it is to be mounted on the back of the panel at the right end in a manner to be detailed in the next article.

The layout for the drilling of the filter box cover is shown in figure 10. This

two horizontal rows of holes marked C are to accommodate binding posts or machine screws to which the connections are made. It will be noted that there are four of these holes around each of the A holes and that there are sixteen altogether. Around the edge of the cover are 16 holes 5/32 inch from the edge by which this cover may be fastened to the filter box. When the filter box has been soldered as detailed last week, this cover may be laid on the 1/8-inch flange which was provided, and a pencil used to mark



Fred W. Stein

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Part VII—Operating Multitube Receivers

By Edward Thomas Jones, A. I. R. E.

THERE are so many types of multi-tube receivers and so many variations of the various types that it is somewhat difficult for one to write an article around their operation which will meet with the needs of everyone. Therefore, the writer will try to cover only those things which in his opinion will benefit the greatest number. When a newly created fan sets down to a 5, 6 or 7-tube receiver he feels very much like a sailor who has been asked to operate a heavy tank. Though the instructions may seem clear there are so many things to be done and the sounds that come out of the horn are so varied that the newcomer is much perplexed and often wonders whether he will ever get the contrivance to work.

In order to eliminate difficulties which may arise outside of the receiver itself a few points should be carefully inspected. If an outside aerial is used be sure that all connections are either soldered or carefully made and taped. The ground should be a good electrical connection and not just a piece of corroded wire wrapped on a badly corroded pipe. The A battery should be tested with a hydrometer to be sure it is fully charged and the B battery should be tested. A voltmeter with a scale covering 0 to 50 should be used to determine the voltage available on the B batteries.

In connecting the batteries if an error is made with a small set it means blowing out but one or two tubes while if an error is made in a larger set it means \$18 to \$24 will be absolutely wasted in a single bright flash. Have no tubes in the set when making connections and turn the rheostat to the "off" position. When you have made the connections and feel fairly certain that they are correct, insert one tube and turn the filament switch to the "on" position. The rheostat can then be slowly turned and if connections are correct the tube will gradually come to a red glow. Now disconnect the A and B batteries and connect the A battery to the terminals intended for the minus B and plus B 90-volt wires. The tube should not light up and if it does it is an indication that there is something wrong within the set. Assuming that the tube does not light up you can connect the A wires to their proper terminals and the B wires where they should go. The rheostat should be turned to the "off" position and the remaining tubes inserted in their sockets. It will be noticed that a red thread has been woven into one cord of the loud speaker cord and this cord tip should be so connected to the plug that, when the plug is inserted in the jack, the red wire will connect to the B plus side of the receiver jack. This will insure maximum volume and clearness and will not injure the speaker.

Super-heterodynes

The super-heterodyne receiver, while supposed to be the best set as yet developed, is among the easiest to operate. There are but two tuning controls one of which tunes the loop antenna circuit while the other tunes the oscillator. These two dials will usually tune very closely together and any station will be heard at two points on the oscillator dial. This is inherent in super-heterodynes.

The potentiometer is the only critical adjustment on this type of set and once adjusted will only have to be changed once in a great while. It will be found when turning the potentiometer that a point is reached at which a slight hissing sound is heard and possibly a low whistle.

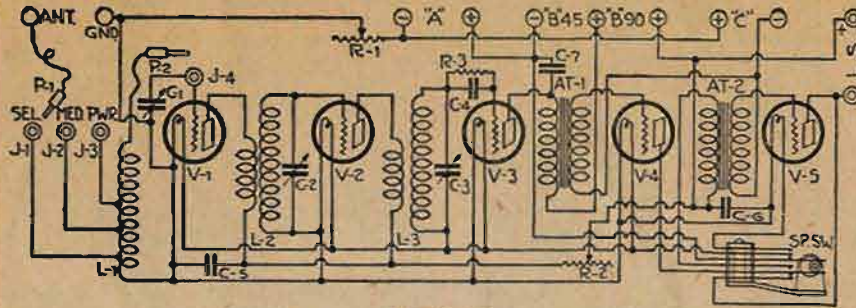


Figure 19

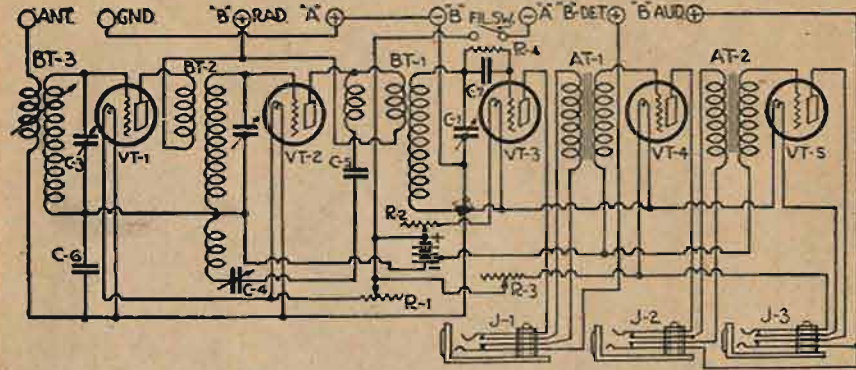


Figure 20

The potentiometer should be turned back to the point just below where the whistle or hissing noise is heard. With it in this position the tuning controls may be operated and a station brought in. Once the maximum adjustment of tuning controls for that station has been found the position of the potentiometer may be varied until volume is at maximum and the clearness has not yet begun to be affected by regeneration. When tuning to a very distant station it will usually be found that the potentiometer can be advanced slightly beyond the point used for reception of local and medium strength stations.

If all hard tubes are used, the setting of the rheostat will not be found critical once the proper grid leak adjustment of both detectors has been determined. Tubes such as the UV-201A and the UV-193 may require as high as 7 to 9 megohm leaks for best results.

Tuned Radio Frequency

Receivers of this type are all alike in one respect in that large diameter air core Radio frequency transformers are used. The chief difference between them consists in the method of preventing oscillation on the lower wave lengths. Many sets accomplish this by decreasing the number of turns on the primaries to the point where oscillation through feedback through the tube cannot occur but this has certain disadvantages that many manufacturers do not like to incorporate in their sets. If the reader has built his own tuned Radio frequency receiver and has difficulty with oscillation he may be interested in the method employed by some of the manufacturers to prevent it. There is of course the well-known neutrodyne method of utilizing very small condensers called neutrodons in connection with tapped secondaries. Another method is shown in figure 19 which may be called the deresonating system. A resistance of about 1800 ohms, R-2, is inserted

in the untuned plate leads and increasing this resistance will lower the voltage in the plate circuits which will have the effect of decreasing the tendency to oscillate at lower wave lengths. When tuning to the higher wave length stations this resistance may be decreased which will bring the plate circuits up to a point where regeneration is introduced but kept under control and the sensitivity of the entire set thus increased.

Another method is shown in figure 20 which might be called the reverse feedback method in which system a small coil is wound on the primary of the third transformer and another small coil in close relation to the secondary of the second transformer. These are connected by a small variable condenser in series with a fixed protective condenser, and energy which is out of phase with that in the second grid circuit is introduced to oppose, and neutralize, the feedback in the second tube.

There are many receivers on the market utilizing tuned Radio frequency in which oscillation on the lower wave lengths cannot be controlled with 96 volts on the plates of the R. F. tubes. If the owner is sufficiently familiar with Radio and cares to remove the set from the cabinet he can readily determine which are the Radio frequency plate leads and can disconnect these from the B plus terminal and provide another binding post for them. The B 90-plus terminal will then only connect to the audio frequency amplifiers and the Radio frequency plate return leads will connect to a binding post of their own. Various voltages from 67 to 90 can be tried on these R. F. tubes until one is found that does not permit oscillation on lower wave lengths yet is not so reduced that the volume is materially affected.

Tube Pointers

In a six tube set there are 24 socket springs any one of which may have become dirty or which may have been bent down so that contact is not made with one of the 24 tube pins. These should be examined when trouble occurs. A super-heterodyne with 8 tubes has 32 such possible causes of trouble. While the standards of construction in jacks have been considerably improved of late they are still not absolutely trouble proof and when signals are not heard in one of the audio

(Continued on page 20)

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CHART NO 3

WAVE LENGTH RANGE 190 TO 600 METERS

C = 500 mmfd. = .0005 mfd. L = 200 microhenries

DIA. OF TUBING	3 INCHES		3½ INCHES		4 INCHES	
GAUGE OF WIRE & S. D.S.C.	LENGTH OF WINDING IN INCHES	NUMBER OF TURNS	LENGTH OF WINDING IN INCHES	NUMBER OF TURNS	LENGTH OF WINDING IN INCHES	NUMBER OF TURNS
20	2.05	55	1.7	46	1.5	41
22	1.55	51	1.3	43	1.15	38
24	1.15	47	1.0	41	0.87	36
26	0.9	45	0.75	38	0.67	34
28	0.7	42	0.62	37	0.55	33
30	0.57	40	0.5	35	0.45	32

HOW MANY WIRE TURNS

(Continued from page 15)
 form to give the required value of inductance in microhenries, which can be proved by use of the formula:

$$L = \frac{(5 \times 3 \times 83)^2}{1000 \times 1000} = \frac{1550025}{1000000} = 1.55 \text{ microhenries.}$$

In chart number 2 we find a 4-inch tube wound for 1.5 inches with 49 turns of number 22 dsc. wire equals 290 microhenries:

$$L = \frac{(5 \times 4 \times 49)^2}{1000 \times 1000} = \frac{960400}{1000000} = 0.96 \text{ microhenries.}$$

In chart number 3 we will assume the use of a 3.5 inch tube wound with 41 turns of number 24 dsc. wire occupying one inch of space:

$$L = \frac{(5 \times 3.5 \times 41)^2}{1000 \times 1000} = \frac{457642.25}{1000000} = 0.457 \text{ microhenries}$$

and referring to our first formula $\lambda = 1885 \sqrt{LC}$ we find that

$$\frac{1885 \times \sqrt{180 \times .0005}}{1885 \times .3} = 565.5 \text{ meters}$$

which is within the broadcast range. The gauge of wire, number of turns and size of tubing, given in this and in the previous article, have been calculated from the formulas shown in the two articles. While the inductance values are not exact they will be found adequate

B. & S.	single	double	single	double
gauge	enamel	cotton	cotton	silk
20	29	25	23	27
22	36	31	28	34
24	45	37	33	42
26	56	45	39	52
28	71	54	45	63
30	88	64	56	77

to cover the present broadcast band. If it is desired to use wire with insulation other than shown, the accompanying table

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will show the number of turns per linear inch with various insulations.

The Reader's View

Less Stations

Your article, "Less Stations and Better Radio," is appreciated. There sure is no need for so many stations. The hook-up of WEAJ is wonderful and we surely can listen to any one program from there. Why so many? I never could understand what good people get out of Radio by simply getting station announcements. Keep up publishing these kind of articles.—Myron S. Landis, Coopersburg, Pa.

Closing with National Anthem

I have noticed that all Canadian broadcasting stations close their programs with their national anthem and that the only time an American station closes with the Star Spangled Banner is when a military band is playing. Why is it so? Are the Canadians more patriotic than we?—E. H. Fuller, Fort Hayes, Columbus, Ohio.

Tin Can Type Set

I want to bring to your attention, and the attention of many thousands of Radiophans, a matter of vital importance to Radio broadcasting and reception. Today we have in these United States many thousands of Radio receiving sets, there are in the homes of America sets costing up to at least five hundred dollars, this money has been spent that the ones at home might enjoy the programs of the artists of our country, and yet it is impossible for them to do so. I am making this statement for the reason that I have a most wonderful Radio set, one without the unpleasant

whoops and howls that we had with the first sets built. But with the small one tube regenerative sets which are scattered all around this city, it is next to impossible to receive a program without so much distortion that it is very unpleasant and when one has a friend in his home he is ashamed to have him listen to the set.

If the factory building these little sets, or the user who builds his own, "rolls his own," perhaps I should say, for the looks of the one is about like the other, got any satisfaction out of the product it would be a different story, but when one sits down to tune into a broadcasting station and has to listen to all the whoops and howls of a thomas cat, no, I don't believe there is a cat on the earth who may or will make a class of noises equal to the "tin can type" regenerative Radio set. I can't see where he comes in. Then his neighbor catches "what Patty gave the drum," his program is ruined, he has to listen to all the unpleasant noises the regenerative set is making, his friends and listeners are disgusted.

Regardless of who owns one of these sets, I feel that no man should be allowed to ruin the program of another. If I had one and I knew that a few doors away I was injuring the program of my neighbor, certainly I would tear the thing up. If I could not own one that did not cause my neighbor unhappiness I would not give him a dime for it. I haven't the disposition to want to spoil an evening for anyone, from the poorest to the richest family in our city.

I have sold Radio sets for several years and I am ashamed to say that when we only had the little three tube regenerative sets I sold them and no doubt they are still annoying someone. Today I sell only sets of the non-regenerative type, and if I had the old style to sell someone else would have to sell the goods. I have noticed that Mr. Hoover has stated "that 'jazz' will not build up the Radio world," or words to that effect. Please allow me to add that the unpleasant whoops and howls of the "tin can type" of Radio sets will do more to tear it down than jazz.

I believe the government should pass a law requiring that all sets installed would have to pass a laboratory test and be approved before being used, that sets which radiate and are of the regenerative type should not be allowed to be used. These sets are not only annoying the listeners in the homes, but are interfering with commercial broadcasting, market reports from Washington, D. C., Associated Press, and others.

I would like to ask that you call the attention of the Radiophans to this matter that they may give their views upon the

subject and if possible take steps to remedy the trouble.—H. S. Speck, Little Rock, Arkansas.

Eastern Silent Hour Wanted

Your fine paper is appreciated very much. I would certainly like to see you sponsor a movement to get the broadcasters, except far west and Pacific stations, to remain silent after 11 p. m. Eastern time at least one night, say Monday, of each week. Then we would have the opportunity of hearing western and Pacific coast stations undisturbed by eastern and central broadcasters.

Some eastern stations seem to run all night. Their staff members need a rest at least one night a week.

Improperly operated radiating sets need a few sermons, too.—F. H. C., Gastonia, N. C.

FOUR FILTER SUPER

(Continued from page 13)

altered diagram to take care of this situation of using 199 tubes in a locality far from all stations. The small tubes where there are stations, or the large tubes where there either are or are not stations, will be O. K. using the circuit given. It should be stated that the above results were on loop aerial; on outside aerial, the small tubes on push pull were satisfactory.

(In the next article Mr. Fournier will take up the front panel layout and assembly, which, if followed carefully, will result in the panel mounted parts fitting exactly between those on the sub-base. The wiring will also be started.—Editor's Note.)

REFERENCE LIBRARY

(Continued from page 19)

frequency stages the jacks should be carefully examined to see that the shorter springs make contact with the longer springs when the plug is not inserted or that the long springs both make contact with the phone plug when it is pushed in.

Where 6 to 9 tubes are used it will be found most desirable to switch the tubes around in sockets to determine which function best as Radio frequency amplifiers, oscillator, detector or audio frequency amplifiers.

(The last article of Mr. Jones' series will be on antennas, the reasons for erecting different types and the form they should take for various receivers. The loop, for example, has certain advantages desirable in many localities, but cannot be used on all sets.—Editor's Note.)

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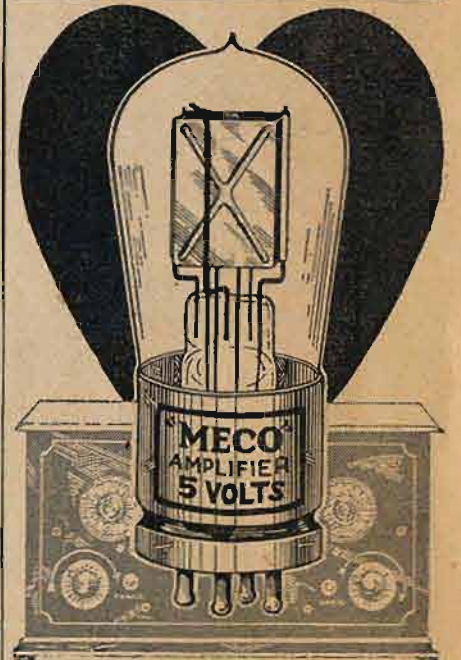
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Wash Boiler Parts Make Loud Speaker

Tone Minus Distortion in Metal Lamp Horn

An attractive and effective loud speaker on the lines of a table lamp can be made as follows: The materials used were the copper from the bottom of an old dis-

WORKSHOP KINKS EARN A DOLLAR—

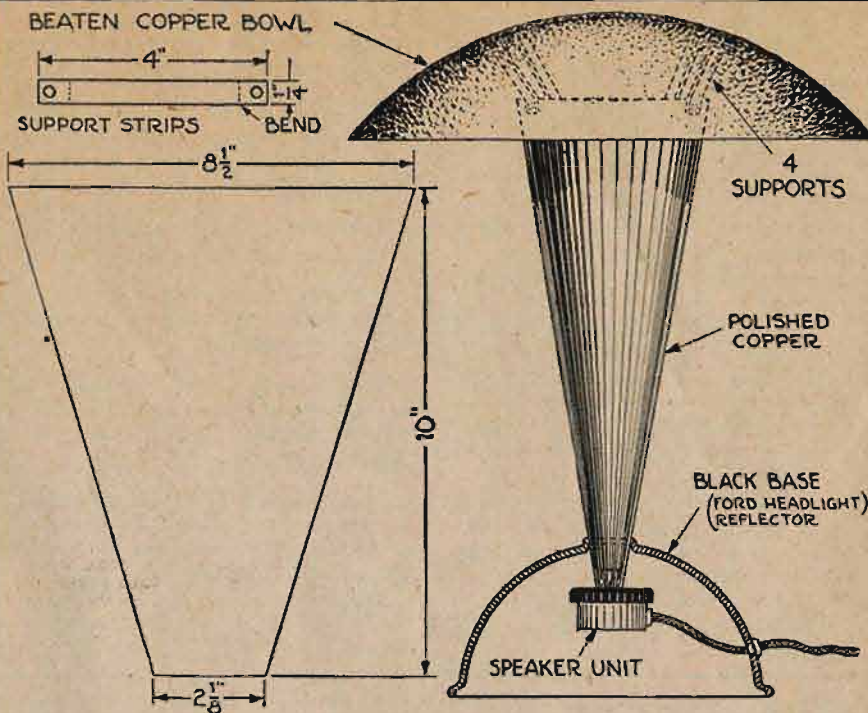
THERE are many little kinks worked out at home that would aid your fellow Radio worker if only he knew about them. There are new hook-ups, new ways of making parts and various unique ways of operating sets that are discovered every day. Radio Digest is very much interested in obtaining such material.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

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

carded wash boiler, an old automobile headlight and some solder. The base was made from the reflector of the headlight. The grooved part of the reflector was cut off so that it will set flat on the table. The edge should be smoothed up with a file to prevent scratching the varnish.

A circular disk 12 inches in diameter was cut from the copper of the wash boiler bottom. This disk was hammered into shape. To do this procure a block of wood and use a round head or what is called a ball peen hammer. Place the copper disk on the block and hit it (not tap) all around about 1/4 inch from the edge. When this circle of hammer marks is complete begin another circle just inside of the first and continue until the center is reached. Go over the circles again, and so on until the disk assumes the shape of a hammered copper bowl about 4 inches deep. This hammering is

TONE ARM PATTERN AND SPEAKER



not difficult to do and a very artistic effect can be secured.

For the tone arm cut a strip of copper in the shape of a decapitated triangle, as shown in the illustration. Roll this into a funnel, lapping the edges about 3/16 inch and solder the joint. Insert the small end of this funnel into the hole of the reflector, allowing it to project into the bowl about 1 1/2 inches, and solder at the joint.

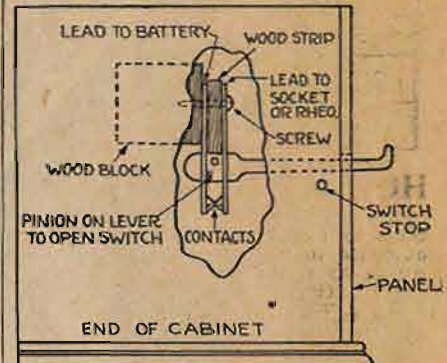
Make some strips of copper 4 inches long and 1/2 inch wide and solder them to

the large end of the tone arm so that they will project about 3 1/2 inches. These strips serve as supports for the top. Invert the hammered bowl and solder it to the supports so that it will be about 1 1/2 inches above the tone arm. It may take some experimenting to get the right distance to produce the volume wanted. Insert the loud speaker unit and fasten it to the small end of the tone arm.—Ray C. Hall, Pine Bluffs, Wyoming.

Old Telephone Hanger Makes Filament Switch

The illustration shows a homemade switch which automatically opens when the head phones are hung on the hook. This device has no advantage over other switches if the user fails to hang up the phones.

The switch may be mounted on the side of the set and arranged so that the hook extends out and away from the cabinet.



The contact strips consist of two parts of an ordinary jack placed so that the contacts face each other and are separated by a strip of insulating material. The fastening screw should not touch both pieces. The lever may be made of 1/4 to 1/2-inch metal, or one taken from a discarded telephone.—Howard Smith, Falls Creek, Pa.



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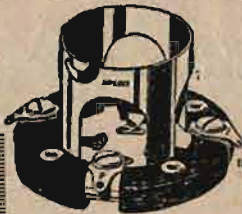
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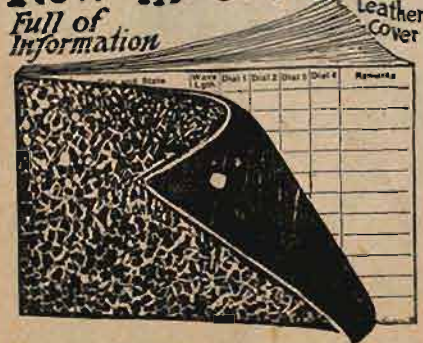
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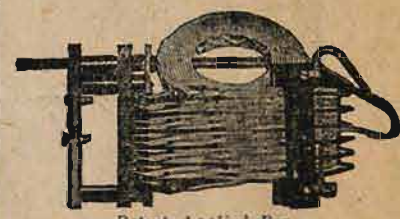
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Questions and Answers

Neutralizing with the "X" Wire

(12330) GWS, Youngstown, Canada.
In your December 27 issue there appeared an article "X" Wire Key to Neurodyne Success." How do you neutralize this new circuit and could you give me any pointers on it?

Can I use a five-plate condenser in place of the seven-plate in the heiduogen recently described in your paper?

A.—The third neurodyne is set at minimum and two individual tube neurodynes are adjusted in the usual manner by placing a small piece of paper on one of the filament springs. When the circuit has been adjusted in this way as far as possible, the dials are then adjusted for resonance on a low wave length and if there is a tendency for the receiver to oscillate the third neurodyne is increased in capacity until the tendency to whistle disappears. If this latter part of the procedure is done on the lowest wave length one wishes to receive there will be no whistle or oscillation on any wave lengths above it.

Relative to the use of a five-plate condenser in place of a seven-plate unit in the heiduogen we must advise that this will not be large enough as a seven-plate just covers the range as it is. In fact, if the seven-plate condenser happens to be made with rather small plates and large spacing between plates, the builder of this set is unable to get above 485 meters. Some of the condensers on the market are made with full size plates and no difficulty is experienced but there are a few in which the plates are small and they should be rated by capacity such as .00012 or .00014 instead of by the number of plates.

B Battery Circuit Fuse

(12346) WAA, Newark N. J.
I have just had the unpleasant experience of blowing out three tubes and since it has cost me \$12 to replace them I am writing to ask if there is not some means of preventing a recurrence of this accident?

A.—There are several excellent devices on the market, all of which are very low in cost, for preventing the blow-out of tubes. These are known as fuses and usually consist of a small base in which fuse elements can be inserted to make contact with the terminals. Most of them are designed to blow out at 160 milliamperes, and since either the UV-201A or UV-199 will stand considerable overload for a few moments the fuse blows first.

Selectivity in Reflex Sets

(12347) GLM, Urbana, Ill.
I have carefully constructed a three tube reflex which has tuned Radio frequency on the first two tubes. There is a crystal detector and the third tube is straight audio frequency. My aerial is about 125 feet long and the ground is well soldered to a water pipe. On silent night in Chicago I am able to get western stations very nicely, but on other nights the set is not sufficiently selective. It was suggested that my aerial might be too long, so I tried the set on a shorter aerial about 50 feet long, but the set is still too broad. What can I do to remedy this?

A.—The difficulty which you outline is the usual thing with reflex receivers, as it seems almost impossible to make these

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The Question and Answer department offers service to Radio Digest readers without charge but asks that the following suggestions be read carefully before writing.

- 1—Search carefully the back issues which you have, as the point in question has probably been covered several times before.
- 2—Letters for this department should be kept separate from all correspondence to other departments and on other subjects.
- 3—Questions should be written on one side of paper only and each sheet should bear the sender's name and address. All letters should be accompanied by a self-addressed stamped envelope of standard business size.
- 4—Unsigned (or anonymous) letters cannot be answered, either on this page or by letter, nor can those without address.
- 5—No circuits of any standard manufactured receiver will be published.

6—No comparative statements on advertised apparatus will be given except as to efficiency in some particular circuit.

7—Drawing diagrams on a separate sheet of paper will save time and enable us to give all questions more attention.

8—Write each question as a separate paragraph.

9—Make a copy of your letter and diagrams, to which we can refer without re-drawing.

10—The names and addresses of the writers of letters published will not be released except with the writer's permission.

11—We want to be of assistance to you in your difficulties, but are sometimes limited because of the length and time required for the proper consideration of the questions asked. Therefore, please make your letters brief.

sets sharper. Three years ago the tubes were coupled with untuned transformers and all tuning was done with a condenser across the loop or across the secondary of a variocoupler. When more stations were put on the air and tuned Radio frequency came in the transformer used to couple the first and second tube was made of the tuned variety, such as you have, but this does not seem to materially affect strong stations within 500 miles. In this case we can suggest no remedy which will sharpen your receiver.

Regenerative Receivers

(12338) GFM, Austin, Texas.
A number of my friends have what they call regenerative receivers, yet these sets seem to be very different in their internal construction and operation. Will you please explain how this is that they can be so differently constructed and yet all be the same type?

A.—The phenomenon of regeneration can be secured in several different ways. If some of the energy in the plate circuit of the detector tube is fed back into the plate circuit by direct magnetic coupling the benefits of regeneration will be secured. If the plate circuit of the detector tube is tuned so that it can be brought into resonance with the grid circuit there will be feedback or regeneration take place across the internal capac-

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ity of the tube. The grid circuit of the detector may consist of the secondary of the variocoupler shunted by a variable condenser with the plate circuit tuned with a variometer; another method would be to remove the variable condenser and insert a variometer in series with the secondary of the variocoupler. These two systems employ the principle of tuning the plate to resonance. Inductive coupling may be employed either by putting a tickler coil in series with the phones and B battery or placing a tickler coil in series with a variable condenser with these two units in series and parallel to the phones and B battery.

Radio Frequency Stages

(12414) WPL, Dallas, Texas.
Can you tell me if it is feasible and practical to construct a three stage Radio frequency instead of two, such as is used in the usual neurodyne set? If this three stage will operate on a loop? I have an

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outside aerial and would like, if it is practical, to construct three stages of Radio frequency neurodyne receiver that can be operated either on a loop or outside aerial and would appreciate a plan arrangement showing connection for the receiver that would operate successfully with such a hook-up. Of course in the addition of these three stages of Radio frequency I will add the usual two stages of audio frequency. Would there be any advantage in having this third stage of Radio frequency?

A.—While it is possible to add another stage of Radio frequency to a neurodyne set it is unnecessary. Most of the neurodynes are sensitive enough with only two stages. The addition of another stage means another control knob.

A loop cannot be used with a neurodyne because it would tend to interact with the neuroformers. You can possibly use a loop if you have the whole cabinet shielded, but this would be somewhat detrimental.

Power Hum Interference

(12326) JLB, Copan, Okla.
For the past three months I have been troubled with a hum or roar that appears to come from my electrical meter, however, all the hum does not come from the meter alone, for when the entrance switch is turned off the noise is still there, but it is not so strong. My set is a four tube single circuit, using two stages of audio with plug connections on two, three or four tubes. The noise is heard in all connections, but during daylight the hum is the loudest.

The hook-up has been traced and no fault found, and when the set was moved to another part of the city the noise ceased. I would be pleased to have your advice and what to do to eliminate the hum?

A.—Try a three circuit tuner. Consult the engineer at your local power plant and tell him your trouble. The three circuit tuner may eliminate the hum. Enlist the aid of a local amateur in Radio and have him help you to locate the source of the trouble.

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Corrected Every Week—Part III

FIND MISTAKES AND YOU'LL GET DOLLAR

ONE DOLLAR will be paid to the Radiophone reader of Radio Digest submitting the most errors in any one station's listing in the Directory of Radiophone Stations, which appears in five parts, serially continuously on the next to last page. Letters must reach Radio Digest's office not later than one week from date of issue corrected. Readers are not limited to correcting one station, but such corrections must be verified by the stations themselves, and NOT by comparison to other so-called accurate Radio directories or lists. Turn in corrections for as many stations as you can find—if you can find errors! Use separate sheet of paper for each station submitted and place name and address on each sheet. In case of tie, duplicate awards will be made.

United States (Cont'd)

NOTE.—The third part of the schedule list appears below. The fourth part which consists of the remainder of the list will appear next week.

WBES, Takoma Park, Md. 222 meters. 100 watts. Bilas Electrical School.

WDZ, Tuscola, Ill. 278 meters. 100 watts. James L. Bush. Daily ex Sun, 9:30 am, 10, 10:30, 11, 11:30, 12m, 12:30 pm, 1, 1:15, Chicago Board of Trade quotations. Central.

WEAA, Flint, Mich. 234 meters. 100 watts. Frank D. Fairbank. Slogan, "The Vehicle City." Daily ex Sun, 7 pm, police broadcasts, music. Eastern.

WEAF, New York, N. Y. 481.5 meters. 2000 watts. A. T. & T. Co. Slogan, "The Voice to the Millions." Daily ex Sun, 4-5 pm, Tues, Wed, Thurs, Fri, 11-12 m. Mon, 6-11:30 pm, Thurs, 8-11 pm, Wed, Thurs, Fri, Sat, 6-12 midnight. Sun, 2-5:30 pm; 7:30-10:15, Eastern.

WEAH, Wichita, Kan. 263 meters. 50 watts. Wildlife Board of Trade. Announcer, Amos Badstam. Slogan, "Kansas Grows the Best Wheat in the World." Daily ex Sun, 10 am, 11, 12, 1 pm, markets. Daily ex Sat, Sun, 2 markets. Tues, Fri, 8-10 pm, music. Central.

WEAL, Ithaca, N. Y. 254 meters. 500 watts. Cornell Univ. Irregular.

WEAP, Vermillion, S. D. 278 meters. 100 watts. Univ. of S. D. Announcer, Sidney Lawton. Slogan, "South Dakota for South Dakotans." Wed, 8-8:30 pm, music; 9, talks, athletics; 10-11, popular music. Central.

WEAM, North Plainfield, N. J. 261 meters. 250 watts. Borough of N. Plainfield. Announcer, H. Blackford Slogon. Slogan, "The Home Municipal Broadcasting Station." Fri, 8-10:30 pm, concert, talks, Eastern.

WEAN, Providence, R. I. 270 meters. 100 watts. Shepard Co. Announcer, R. Foster Reynolds. Daily ex Sun, 12-1 pm, 4-5, music, reports, weather, concert. Wed, 10-15 pm, organ. Mon, Tues, Wed, Fri, 8-10, concert. Sat, 9-11 pm, dance music. Sun, 10-15, 7-10 pm, music. Eastern.

WEAO, Columbus, O. 293.9 meters. 500 watts. Ohio State Univ. Announcer, Mrs. E. G. Charles. Slogan, "Where Education Advances Ohio." Daily ex Sun, 9:45 am, 11, markets, weather; 1 pm, talks to farmers, markets, music. Tues, Thurs, 4 pm, lectures, music. Wed, 8 pm, music, lectures, Eastern.

WEAP, Mobile, Ala. 263 meters. 100 watts. Mobile Radio Co.

WEAR, Cleveland, Ohio. 283.4 meters. 1000 watts. The Good Tire & Rubber Co. Daily ex Sun, 11:30-12 m. Daily ex Sat, Sun, 3:30-4 pm, markets. Mon, Wed, Fri, 7-8 pm, dinner concert. Tues, 7:30-11 pm, Cleveland News program. Thurs, 7-11 pm, music. Sun, 1-2 pm, music. Eastern.

WEAU, Sioux City, Ia. 275 meters. 100 watts. David-son Bros. Co. Announcer, Kenneth Gamet. Slogan, "The Heart of the Corn Belt." Daily ex Sun, 10 am, 11, 12 m. 1 pm, 1:30, 5, markets, weather. Tues, Thurs, Sat, 7:30 pm, Central.

WEAY, Houston, Tex. 359 meters. 500 watts. Iris Theatre (W.H. Horstiz, Jr.). Slogan, "Where All the Queens Meet All the Ringers." Daily ex Sun, 1 am, news; 12-1 pm, concert; 2:30-3:30, concert; 6, news, sports; 6:15-7:15, dinner concert. Tues, Wed, Fri, 8:30-10 pm. Sun, 11 am, 8 pm, church service. Central.

WEBA, New Brunswick, N. J. 233 meters. 15 watts. The Electric Shop, Georges N. Deslauriers. Slogan, "Wonderful Broadcasts by Air WEBA." Mon, Thurs, 8-9 pm, music. Eastern.

WECB, Superior, Wis. 242 meters. 10 watts. Walter Cecil Bridges.

WEDB, Anderson, Ind. 246 meters. 10 watts. Elec. Equip. & Service Co. Announcer, F. R. Fulbright.

WEEB, Cambridge, Ohio. 234 meters. 10 watts. Roy W. Walker. "Temporarily off the air."

WEEB, Chicago, Ill. 308.2 meters. 1000 watts. Announcer, Robert Belmont. Slogan, "The Voice of the Great Lakes." Slogan, "Beaumont Hotel Co. Chicago." Slogan, "Daily ex Sun, Mon, 7-8 pm; 9-10, 11-12, Sun, 5-6 pm, twilight musicale, 7-9, Central.

WEEJ, New York, N. Y. 273 meters. 500 watts. Third Avenue Railway company. Announcer, H. A. Bruno. Tues, Wed, Fri, 7-9 pm, Eastern.

WEEK, Grand Rapids, Mich. 242 meters. 20 watts. Grand Rapids Radio Co. Slogan, "The Voice of the Furniture City." Daily ex Sun, Wed, 7-8 pm, Wed, 7-8 pm, Sun, 7-8 pm, Central.

WELB, (Portable Station), 226 meters. 100 watts. Radio Corp. of Amer.

WEMB, Mobile, Ala. 226 meters. 100 watts. Radio Corp. of Amer. (Portable.)

WEOB, Hamilton, Ohio. 252 meters. 5 watts. Radio Co. Announcer, Harry W. Fablander. Tues, Fri, 8-10 pm, orchestra talks. Sun, 2-4 pm, orchestra. Central.

WEPB, New Orleans, La. 280 meters. 50 watts. E. Budd Pieddick.

WEPQ, Harrisburg, Ill. 226 meters. 10 watts. Tate Radio Co. Announcer, Joseph R. Tate. Slogan, "The Voice from Egypt." Daily ex Sun, 15 pm, news, weather. Tues, Fri, 8-11 am, Sun, 7-11 pm, Central.

WERR, Buffalo, N. Y. 244 meters. 15 watts. H. H. Howell. Slogan, "We Extend Buffalo's Regards." Tues, Thurs, Sat, 8:30-11:30 pm. Sun, 12 m. 3 pm, Eastern.

WEBT, Dayton, Ohio. 256 meters. 5 watts. The Dayton Corp. Industrial High School. Announcer, Irvin Sawyer. Slogan, "Worthy Effort Brings Triumph." Wed, Thurs, Fri, 8-11 am, Sun, 7-11 pm, Central.

WEBW, Beloit, Wis. 268 meters. 500 watts. Beloit College. Announcer, W. E. Alderman. Tues, 8-9 pm, concert. Thurs, 7:30-8:30 pm, Fairbanks, Morse Co. band. Sun, 4:30-5:30 pm, vesper services. Central.

WEBX, Nashville, Tenn. 260 meters. 50 watts. John E. Cain, Jr.

WEBY, Roslindale, Mass. 226 meters. 10 watts. Hobart Radio Co.

WBEZ, Savannah, Ga. 234 meters. 50 watts. Savannah Radio Corp.

WEEI, Boston, Mass. 475.9 meters. 500 watts. Edison Elec. Illuminating Co. Announcer, C. R. Emery. Slogan, "The Friendly Voice." Daily ex Sat, Sun, 7-12 midnight. Tues, 4 pm, organ; 7-9 pm, New York. Tues, Thurs, Fri, 9 pm, program from WEAJ, Eastern.

WEMO, Berrien Springs, Mich. 285.5 meters. 500 watts. Emmanuel Missionary College. Slogan, "The Radio

Lighthouse." Mon, Wed, 8-15 pm, music, lectures. Fri, 9-10 pm, sacred music. Sun, 11 am, chapel services; 8:15, chapel services. Central.

WEW, St. Louis, Mo. 248 meters. 100 watts. St. Louis Univ. Announcer, G. E. Rueppel. Daily ex Sun, 9 am, 10, 2, 5 pm, reports. Sun, Tues, Thurs, 7 pm, lectures, music. Central.

WFAA, Dallas, Tex. 475.9 meters. 500 watts. Dallas News and Dallas Journal. Announcer, Adams Calhoun. Slogan, "Working for All Alike." Daily 10:30 am, reports; 12:30-1 pm, address; 2:30-3, 3:30-4, 4:30-5, reports, news; 5:30, bedtime story; 6:45-7, sports, news; 8:30-9:30, concert, weather (silent Wed). Mon, Tues, Thurs, Fri, 6:30-7:30 pm, vesper, report. Tues, Thurs, Sat, 11-12 pm, music. Sun, 6-7 pm, Bible class; 9-11 pm, music. Central.

WFAM, S. Cloud, Minn. 273 meters. 10 watts. St. Cloud Daily Times. Slogan, "Granite City of the World." Announcer, Otto A. Rupp. Daily ex Sun, 1-5 pm, markets. Central.

WFV, Lincoln, Neb. 277 meters. 250 watts. Univ. of Neb. Announcer, R. A. Cushman. Slogan, "The Home of the Cornhusker." Daily ex Sun, 10 am, 12:15 pm, weather, news, road reports. Thurs, 7 pm, program. Sat, 11:30 pm, Central.

WFBB, Eureka, Ill. 249 meters. 100 watts. Eureka College.

WFBC, Knoxville, Tenn. 250 meters. 50 watts. First Baptist church. Announcer, St. John Reynolds. Sun, 10:30 am; 7:30 pm, services; 3:30 pm, sacred music. Central.

WFBD, Philadelphia, Pa. 234 meters. 5 watts. Gethsemane Baptist church.

WFBE, Seymour, Ind. 226 meters. 20 watts. Van de Walle Music and Radio company. Announcer, Clifton M. Flaback. Mon, Wed, 9-10 pm, Fri, 9-10 pm, Central.

WFBB, Altoona, Pa. 278 meters. 100 watts. The Wm. F. Gable Co. Announcer, Roy F. Thompson. Slogan, "The Original Gateway to the West." Daily ex Sat, Sun, 11:45 am, music; 3:45 pm; 6:15, Mon, 7:15 pm, 7:30, 8, 8:45, Tues, 8:30 pm, 11:15, Thurs, 7:15, 7:30, 8:30, Fri, 7:15 pm; 7:30, 8:30, 11:15, Sat, 7:30 pm, Eastern.

WFBH, New York, N. Y. 273.6 meters. 500 watts. Concourse Radio Corp. Announcer, Alvin E. Hanner. Slogan, "Voice of Central Park." Daily ex Sun, 11-12 m, music, entertainment; 12 m, orchestra; 2-6 pm, orchestra, entertainment. Wed, Thurs, Sat, 7 pm, Thurs, Sat, 11:30, Sun, 11 am, children's hour. Sun, 9 am, church service; 7-7:30 pm, entertainment. Eastern.

WFBI, Camden, N. J. 226 meters. 100 watts. Galvin Radio Supply Co.

WFBJ, Collegeville, Minn. 226 meters. 50 watts. St. John's university. Announcer, Hilary Douffler. Slogan, "In the Heart of the Lakeside Paradise." Daily ex Sun, 11:45 am, music; 3:45 pm; 6:15, Mon, 7:15 pm, 7:30, 8, 8:45, Tues, 8:30 pm, 11:15, Thurs, 7:15, 7:30, 8:30, Fri, 7:15 pm; 7:30, 8:30, 11:15, Sat, 7:30 pm, Eastern.

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WFBH, New York, N. Y. 273.6 meters. 500 watts. Concourse Radio Corp. Announcer, Alvin E. Hanner. Slogan, "Voice of Central Park." Daily ex Sun, 11-12 m, music, entertainment; 12 m, orchestra; 2-6 pm, orchestra, entertainment. Wed, Thurs, Sat, 7 pm, Thurs, Sat, 11:30, Sun, 11 am, children's hour. Sun, 9 am, church service; 7-7:30 pm, entertainment. Eastern.

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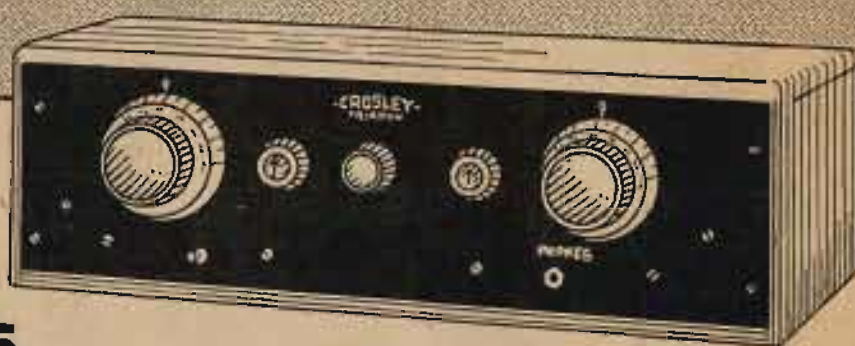
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