

CONSENSUS OF OPINION VOTE

Send to Radio Digest, 510 N. Dearborn Street, Chicago To be forwarded by Radio Digest to the Department of Commerce for the attention of members of Congress.

- 1. Do you want less class B (500 watts or more power) stations?..... Yes No
2. Shall B stations be reduced to 94 in number, so that they can be accommodated satisfactorily in the "ether roadways" now available for the use of broadcasting stations?..... Yes No
3. How far away, approximately, is the nearest class B station?..... mi
4. Are you troubled by B stations heterodyning and interfering with one another?..... Yes No
5. Have you read a description of the Kintner plan?..... Yes No
6. Are you in favor of it or some similar plan which will help clear the air of the present "traffic" congestion?..... Yes No
7. Do you favor the appointment of an unbiased, non-partisan broadcasting control board for the settlement of all differences pertaining to broadcasting and the interpretation of present or future Radio legislation?..... Yes No
8. Include separately a list of five stations you like most and five you dislike most.

How many members Name
in your family?..... Address
Are all of the same mind as yourself?..... City, County, State.....
(Check here if more blanks are desired) 7-11-25

McNAMEE STAYS AT TOP IN CUP CONTEST

PUTS MORE DISTANCE BETWEEN SELF AND HAY

Race Grows Intense—Who Will Be World's Greatest Announcer for 1925? Fans Wonder!

The sage of the East, Graham McNamee, for the second consecutive week has kept his lead on George D. Hay in the 1925 Radio Digest Gold Cup Award, and last week gained considerable leeway between his vote and that of "The Solemn Old Judge" of WLS, who last year won the title of world's greatest Radio announcer.

With the contest approaching a spirited finish and but six more weeks to go, the keenness of the race is keeping everyone's interest high pitched.

McNamee now has 23,364 votes; Hay has 20,503.

Which one will win? Or will perhaps another contestant nose in at the finish? Wagers are rampant. The final vote will tell.

Few Other Changes

The feature race for top position seemed to be the main activity during the past week. Up to seventh place not one contestant changed his position. McNamee, Hay, House, Field, The Hired Hand and Arlin kept the first six places in the order named, which was the same as the previous week.

Frank S. Lane, tenth last week, jumped to seventh this week, and displaced Leo Fitzpatrick, who had that place, throwing him down to tenth. Both Lane and Fitzpatrick are acting very erratic. One can never tell what position they will be in the next week.

Lambdin Kay, now eighth, was ninth last week. W. G. "Bill" Hay, of KFXX, now ninth, was eighth last week. Another trade.

Stanley Barnett took N. Dean Cole's place, eleventh, while Cole took Barnett's, twelfth. Charles Erbstein stayed on the unlucky number, thirteenth. Robert Emery climbed one notch to fourteenth, while O. E. Becker slipped one notch to fifteenth.

Jerry Sullivan, who held sixteen for a long time, has dropped to oblivion, while "Uncle John" Daggett, director-announcer of KHJ, Los Angeles, has pulled into sixteenth from oblivion.

Standing of Sixteen Leaders

The standing of the sixteen leaders, with the total number of votes accredited to date, at the close of the week is as follows:

Table with 3 columns: Position, Name and Station, Votes. Lists top 16 contestants and their vote counts.

Two new nominations were received during the week: Jack Gritton, WADC, and Mrs. B. G. Waters, WCTS. They are rather late, but still might win some recognition.

How to Vote and Get Bonus

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

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

the Radio Digest, until the close of the contest, with the August 22 number.

Each of these ballots will count for one vote when sent in separately. You can hold these ballots until you have 4 that are consecutively numbered, and when they are sent in a bonus of 3 votes will be allowed for your favorite announcer.

For each 8 consecutively numbered ballots your candidate will receive a bonus of 20 votes. For each 12 consecutively numbered ballots, 30 votes. For each 16 consecutively numbered ballots, 40 votes. For each 20 consecutively numbered ballots, 50 votes, and for each 22 consecutively numbered ballots, 60 votes bonus will be allowed.

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

Oakland Station Starts Health Training Exercise

OAKLAND, Calif.—An important addition to the KGO schedule begins Monday, July 13, when free hand callisthenics, or health training exercises, will be broadcast, daily except Sunday, at 7:15 to 7:30 and 8:15 to 8:30 a. m., Pacific time.

Hugh Barrett Dobbs, an experienced director of physical education, will have charge and give most of the lessons. Included in the physical education schedule will be heard, from time to time, stars of the athletic world of football, swimming, baseball, tennis, polo, and golf, each telling his own story of health and personal efficiency. Physicians and specialists in hygiene will also speak as part of this program.

CAN SEE OVER RADIO

(Continued from page 1)

receiving end. On the ground glass screen inside the visitor could plainly see Mr. Baird's face.

The image was crude, coarse and flickering, but it was recognizable, and the indistinctness was due, not to defects in the invention, but simply to the present roughness of the apparatus.

How It Works

In the present stage of the invention a strong electric light is thrown on the object to be transmitted. Behind the light is a disc containing a number of lenses set in a spiral formation.

Behind this disc is another revolving disc with serrated edges, very similar in appearance to the toy cinematograph, or the zoetrope of 50 years ago. On this disc the scene transmitted appears like a scene in the view-finder of an ordinary camera. The disc with the lens is made to revolve at a speed of about 600 revolutions a minute, and the serrated disc runs ten times as fast.

A cell sensitive to light is behind the serrated disc, and, thanks to the whirling spiral of lenses, the light reflected from every part of the object being transmitted is thrown in a very rapid succession upon the cell. This creates an electric current which is strong at the high lights, weak at half tones, and cut off altogether at darkness. The current controls an electric light.

Whole Image Appears

To another revolving disc, traveling at precisely the same speed as the one at the transmitting end, the light from this lamp passes with immense speed in the form of a small spot of light on a glass screen. The spot is bright at the high lights, dim at the half tones, and goes out altogether at black parts of the image.

Owing to the principle of persistence of vision (the principle employed in the ordinary motion picture projector), the rapidly moving spot causes the whole image to appear simultaneously.

Jack Albin, Whiteman Protege, Not so Hot

NEW YORK.—On the hot nights of summer, the Radio audience, usually enjoined to pity the poor musicians playing from a stuffy studio, need let no such thought mar their enjoyment of the new WEAF feature presented by Paul Whiteman—Jack Albin and his Hotel Bossert Marine Roof orchestra.

This combination, broadcasting from aboard their ship (the hotel roof is completely made over to resemble the decks of an ocean liner) and swept by the breezes from the picturesque New York harbor which it overlooks, is probably cooler than most of its listeners.

Broadcast in Public Parks

WINNIPEG.—Another one of CKY's dreams has come true. A year or more ago the Winnipeg station suggested to the Radio trade that it would be an excellent idea if arrangements could be made with the City Parks Board whereby loud speaker sets could be placed in the parks and special concerts broadcast by CKY. Now it is announced that Radio sets will be installed in the three principal parks. The first program so received, was broadcast from CKY on Sunday evening, June 21.

Find Lost Boy by Radio

SALT LAKE CITY.—An 11-year-old boy of this city who had been missing for several days recently was located, 170 miles away from home, by Radio. It was but a short time after the station had broadcast the report that the youth was found although he was in a tiny country town.

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Looking Ahead

Next Week the Seventeenth Ballot in the Gold Cup Award will appear, and with it the standing of the top sixteen contestants. Will Graham McNamee continue to hold the lead he has so well held for the past two weeks? Will he, George D. Hay or some dark horse win the coveted, solid 14-carat gold cup as the world's most popular announcer for 1925? Only six more weeks to go.

Bridge Receivers Built by Milo Gurney will be shown with the next article of his surprise series. To show that all he has been telling us can be put into practice, he has constructed a receiver whose circuit is very similar to figure 36, shown last week, with compensator and cabling of battery leads.

Assembly of the Portable and Phonograph Super will come next week as the second article of this series of three articles. John G. Ryan covers it completely but concisely and there is plenty of detail in this series so that anyone may build this outfit.

KFRU, "The Voice of Oklahoma," where the Oklahoma Pepper Bird and Frank S. Lane hold forth, will be pictured and described in next week's issue. Although in a small city with thinly populated surrounding country, KFRU has succeeded in becoming very popular.

The Propagation of Radio Waves is accomplished by two means, one of which is electromagnetic radiation. Professor Moreton presents this phase of Radio communication as his next lesson in the A-B-C's of Radio. After reading this next installment our readers will understand why shielding is necessary.

Newsstands Don't Always Have One Left

WHEN YOU WANT

Radio Digest

YOU WANT IT!

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Publisher Radio Digest, 510 N. Dearborn St., Chicago, Illinois. Please find enclosed check M. O. for Five Dollars (\$5.00) for One Year's Subscription to Radio Digest, Illustrated. Name, Address, City, State.

NEWS BRIEFS FROM THE BROADCASTERS

EVEREADY LIGHTENS PROGRAMS FOR SUMMER

Marine Band on Four Stations—"Brewster's Million" at KGO—Tom Brown at WHT

Appreciating the difference between broadcast program interest in summer and in winter, the directors of the Eveready Hour have adopted a new summer program policy. Programs are being prepared for rendition during July and August consisting of light and cheerful music, particularly adapted to the microphone presentation. Two orchestras will alternate on Tuesday nights through July and August, the Eveready Salon orchestra, Nathaniel Shilkret directing, and the Eveready Chamber Symphony orchestra, Max Jacobs directing. Solo voices will occasionally break the straight hour of instrumental music.

Enlargements in KAO's schedules to accommodate dinner concerts from the Brown Palace hotel, Denver, and afternoon musicals from the Rialto theater, also of Denver, have met with sweeping favor. Both attractions have been billed daily except Saturday and Sunday.

The Capitol theater orchestra of Springfield, Mass., under the direction of Fred A. Pullen, was secured recently by WEZ as a weekly feature of this station's programs. This organization will be heard every Monday night during the entire summer season. An hour's concert is given.

After a long and strenuous winter, the popular U. S. Marine band has deserted the inner regions and come out into the open to play for WJZ and WRC on the steps of the Capitol in Washington. These concerts are given on Thursday evenings and broadcast by Stations WRC and WJZ, both of the Radio Corporation of America; by WGY, General Electric company, Schenectady, N. Y., and WEZ, Westinghouse company, in New England.

Glen Rice has assumed the duties of program and studio manager for the Anthony studio of KPFI, a position heretofore held by Paul Reese, who is returning to the vaudeville stage. Mr. Rice comes to his new position with a wide experience in matters of entertainment.

Each Wednesday night while the MacMillan polar expedition is in the Arctic, Superstation WHT is broadcasting a special program to the explorer and his party. Each of the programs is furnished by one of the many organizations in Chicago before which Lieut. Commandr MacMillan has spoken. WHT uses the experimental call letters 9XN while broadcasting to the expedition, so that direct communication can be done.

"Brewster's Millions," the great stage success of a generation ago, will be broadcast Thursday evening, July 16, by the KGO players in Radio form. Wilda Wilson Church, assisted by Fred Thomas and Bert Horton, will direct the production.

Tom Brown, the saxophone king, has been signed as a regular Monday night feature of WHEI, Wrigley building, Chicago. He will broadcast with a 40-piece saxophone band. The term of the contract runs until October 1, when Mr. Brown and his five brothers leave for a tour of Europe.

ADOPT NEW TOURISTS' RADIO-TO-FRIEND PLAN

Milwaukee Amateur Club Starts Summer Correspondence

MILWAUKEE.—Members of the Milwaukee Amateurs Radio club, the local organization of the American Radio Relay league, have joined with the tour bureau of the Milwaukee Journal in creating machinery which will permit tourists visiting Milwaukee to transmit messages by Radio to their friends and relatives back home.

Blanks for Radiograms will be provided at the several auto camps in and adjacent to the city, at the headquarters of the tour bureau in the Journal building, and at the Milwaukee Municipal Tourists' Welcome bureau. These messages will be picked up at regular intervals by the Milwaukee amateurs and relayed by them.

French Radio enthusiasts in Paris have elected a queen to reign over their social activities. At a recent dance by the Radio club of the 5th arrondissement of Paris, Mlle. Germaine Lemaire was chosen Queen of the Radio fans.

WILL SAVE \$50,000 WITH SET SAYS FAN

SAN FRANCISCO.—Here's a prize story from Eric H. Palmer, world Radio tourist. He was talking to a man who had just purchased an elaborate set for use in China. When asked what he expected to hear there the man said, "Not much. But I've been passing time playing poker and losing continuously. I decided that listening in would keep me away from the game and probably save me \$50,000 next year at the rate I'm going now."

BROADCAST 14 HOUR RELIGIOUS SERVICES

CHICAGO.—The National Radio chapel sponsored by superstation WHT here, is one of the longest non-stop programs broadcast from any station in North America. Commencing at nine o'clock every Sunday morning, the Radio chapel services are kept on the air without a single stop until 11:30 P. M. The service is under the direct supervision of Rev. Paul Rader, one of the most distinguished evangelists in America.

TELLS THE LADIES HOW TO DRESS



Helen Spring is the lady who gives the style talks regularly from General Electric Station WGY, at Schenectady. She is a member of the WGY staff.

Foreign Notes

The public school system of Mexico has hardly been a thing to boast of in the past, but soon every Mexican child will have the benefit of the best facilities the country can afford, by means of the wireless. Picked teachers will broadcast their lectures all over the land, from stations in the big cities; and receiving sets will be installed in the schools to bring their voice to the pupils.

For fifteen minutes recently the auction sale at Christie's world-famous rooms of the Earl of Carnarvon's art treasures, at which an almost priceless Gainsborough came under the hammer, were broadcast. The auctioneer described the bidding, which was very exciting, reaching an amount representing a substantial fortune.

Construction work has been finished on the new station at Seville. This is the second of the Radio stations which are being erected at important Spanish cities, to be completed. Its power is three times that of the first, at Bilbao, which has been heard on the air for some time past.

Radio is gaining in popularity in the Emerald Isle and approximately 3,000 receiving sets had been licensed up to April 1, although Ireland is still without a broadcasting station.

Broadcast Talks on Astronomy from CKY

Noted Astronomer to Deliver "Illustrated" Lectures Soon

WINNIPEG, Man.—The broadcasting of talks on astronomy "Illustrated" by means of a system of numbers which the listener can plot on squared paper, is CKY's latest original feature.

The talks will commence at an early date and will be delivered by a member of the Royal Astronomical society of Canada. They will be made to appeal particularly to young people and prizes will be offered for the neatest representations of the various constellations, as plotted from the groups of figures transmitted.

Miss Mary Proctor, F.R.A.S., F.R. Met. S., known in the United States as "The Children's Astronomer," is coming to Winnipeg next year and will give a short talk over CKY.

Fights Rio de Janeiro Fires

WASHINGTON, D. C.—Reports received here state that the fire department at Rio de Janeiro is planning to erect two Radio stations. One will be installed at its main building at the Praca da Republica and the other at its Maritime station on the Ilha de Santa Barbara.

It is usually cheaper to buy a new condenser than to attempt to fix one which has become damaged.

WNAC TRIES TO END SARGENT NAME USE

WOULD ENJOIN WHT FROM EMPLOYING TITLE

"Jean Sargent" First Radio Name Case in Litigation—Battle in Court Looms

CHICAGO.—For the first time in the history of broadcasting a battle is now on between WNAC, Boston, and Superstation WHT here, over the use of a name—"Jean Sargent."

Jean Sargent, of whom mention has been made previously in Radio Digest, is probably the most conspicuous woman broadcaster in the world. She made WNAC famous for its women's features, all of which were arranged by Jean Sargent, who really is Bertha Mitchell. She made the name "Jean Sargent" mean something.

But she didn't originate it. It was suggested by the Shepard Stores, Boston, owners of WNAC.

And so, when Superstation WHT made an attractive offer to Miss Mitchell, and she accepted because, it has been said, working conditions were not altogether satisfactory in Boston, the Shepard Stores threatened to enjoin WHT and the lady in question from using the name of Jean Sargent.

Attorney Says Use Name

Attorneys for WHT and Miss Sargent have advised that she may use her Radio name as long as she desires, providing she announces, as she now does, "Jean Sargent, formerly of WNAC."

In the meantime WNAC may continue to use the name "Jean Sargent." The only question remaining is whether or not WNAC's successor to Miss Mitchell's post can keep the name as popular as it was.

Miss Sargent is now organizing a WHT Women's club. The drive she has inaugurated has already been eminently successful and members are still being listed. When she left Boston, her WNAC Women's club had a membership of 20,000.

Miss Sargent will have regular meetings of the club in the studios of WHT, in the Wrigley building, and in this way will become better acquainted with what Chicago women desire from the Radio.

New Stations

KLDS, Reorganized Church of Jesus Christ of Latter Day Saints, will now be on the air as a 1,000-watt station. WCBD, Zion, Ill., is another station to take advantage of the summer permit to use more power. This station is now operating on 2,000 watts.

Many stations are still changing locations and wave lengths. WABL, Storrs, Conn., now uses the call WCAC at Mansfield, Conn. KFVO, Kirksville, Mo., although a new station has been given the call KFKZ. WCBZ, Chicago Heights, is now WOK, Homewood, Ill. WJAG, Shreveport, has the call KWKH. WSAF, New York, is WSDA. WWAE has moved to Plainfield, Ill.

New licenses have been issued this week to WRBG, C. L. Carrell, Chicago, Ill., 100 watts, 215.7 meters (portable); WJBP, First Presbyterian church, Meridian, Miss., 5 watts, 209.7 meters; KPVZ, Glad Tidings Tabernacle, Inc., San Francisco, Calif., 50 watts, 234 meters; WGMU, A. H. Grebe & Co., Inc., Richmond Hill, N. Y., 100 watts, 236 meters (portable); WEHS, Robert E. Hughes, Evanston, Ill., 20 watts, 205.4 meters.

Twelve commercial class "A" station licenses were deleted last month. These were: WGBO, San Juan, P. R.; WRAN, Waterloo, Iowa; WABM, Saginaw, Mich.; WCBY, Buck Hills, Pa.; KPBE, San Luis Obispo, Calif.; WGBN, La Salle, Ill.; WSL, Uxton, N. Y.; WGBL, Houlton, Maine; WRAL, St. Croix Falls, Wis.; WDBE, Youngstown, Ohio; KPQG, Los Angeles, Calif.; KFRP, Redlands, Calif.

Predicts Cost of Radio in Near Future Will Be Small

LONDON.—After making the most exhaustive and continuous tests for nearly a month aboard a transatlantic steamer in New York harbor, Major Secretan, one of the foremost British amateur Radio engineers, is absolutely convinced that really dependable communication can be made by the use of low power and short waves, both day and night. Major Secretan said, "The tests proved conclusively that an entirely new system will eventually have to be used for international Radio communication. Our present methods are obsolete and costly. Radio of the future will not cost more than one-twentieth part of what it does today. This applies both to telegraphy and telephony."

'CURB IS THE LIMIT' CLUB HUGE SUCCESS

YOUNGSTERS JOIN SAFETY ORGANIZATION AT KYW

More Than 57,000 Children Have Signed Pledges in Uncle Bob's Club at Chicago

CHICAGO.—Uncle Bob's safety campaign for children from KYW here has assumed a nation-wide interest, not only among children but by civic bodies as well. Principals of schools have adopted his "The Curb is the Limit" as a slogan, and have promoted the tenets of Uncle Bob's activities to the school children. The chamber of commerce in many large cities has taken to it with keen enthusiasm as have the Kiwanis clubs, the Elks, the Rotary clubs, the Boy Scouts, and various women's organizations, all of whom are joining in making the "Curb is the Limit" a national issue.

"The Curb is the Limit" was formed by Uncle Bob with the aid of the Chicago Evening American, which has sponsored Uncle Bob's idea and the issue has reached proportions beyond the fondest dreams. Insurance companies have printed large placards and posters for country-wide distribution, using Uncle Bob's slogan as the pivot of safety for children. Safety commissions of Chicago and other cities have written Uncle Bob, commending him for his Radio activity and telling of the immense good he has done along the lines of safety.

On June 1, Uncle Bob had received 57,600 pledges signed by children in all corners of the United States, not to cross the street without first counting to ten. To all who send in a pledge, Uncle Bob sends an attractive button signifying membership in his "The Curb is the Limit" club.

ITCHING FEET GET N. Y. ANNOUNCERS

Metropolitan Radio Men Show Love of Change by Making Many Shifts

NEW YORK.—The past month has seen more changes in the family of Metropolitan announcers than any similar period since old WJZ started broadcasting canned music over in Newark years and years ago.

Eddie Squires has left WMCA and returned to Chicago from whence he came some time ago, while A. Lufrio, one-time WEAJ announcer has travelled across Herald Square to WMCA.

Norman Brokenshire, of WJY-WJZ, has followed Omar Khayyams' advice and left for Washington, where he will announce for WRC.

Feiland Gammon—who used to say "WRC" a year or so ago—is now introducing the artists from WOR. NTG is still on the job at WRN, and WAHG's turnover is also zero.

Gilson V. Willets, formerly of WOS and more lately of WOC, is now performing for a new station atop the Hotel Roosevelt.

WJR, Jewett Station, to Officially Open Aug. 15

The official opening date of WJR, to be operated by the Jewett Radio & Phonograph company, has been set for August 15. The transmitting equipment of WJR is housed in a splendid new building on the Jewett factory grounds at Pontiac, Mich. The main studios will be in the Book-Cadillac hotel in Detroit. Howard E. Campbell, widely known engineer of many years' Radio experience, will be in complete charge of all the station's activities. C. W. Kirby will officiate at the studio. Both are familiar personalities to the Radio public.

WBBM Adds Samovar Cafe Orchestra to Entertainers

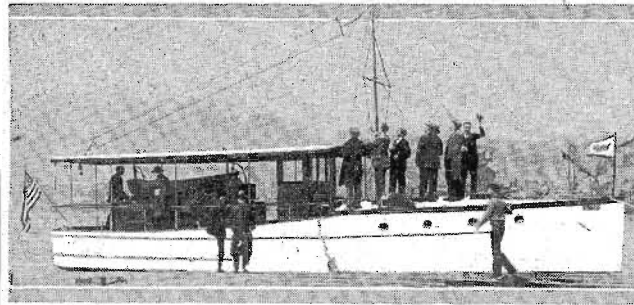
CHICAGO.—The new maximum power station, WBBM here, has further increased its popularity by hooking up Samovar orchestra, playing at the Samovar cafe.

WBBM now has two orchestras. With the addition of the Samovar orchestra, arrangements of which have just been completed, WBBM is one of the foremost stations in the Chicago territory as regards orchestral entertainment.

Antenna Technical Treatise

URBANA, ILL.—"Investigation of Antennae by Means of Models," is the title of a recent bulletin, No. 147, of the engineering experiment station of the University of Illinois. It is a technical discussion of various types of antennae, and may be obtained for thirty-five cents a copy.

"ELCO" IS FLOATING WJZ PICK-UP



The "Elco," with a five-watt transmitter, is the floating pick-up used by Stations WJZ and WGY to broadcast aquatic events. WJZ and WGY rebroadcast the "Elco."

Twenty-Nine Stations in Defense Day's Link

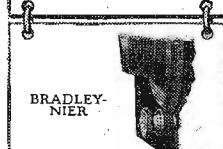
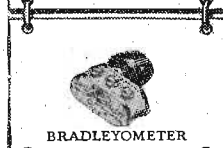
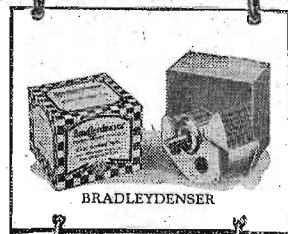
WASHINGTON, D. C.—Twenty-nine broadcasting stations of the country linked together by the long-distance lines of the telephone system, were a part of the program of the National Defense Test Day exercises held on the Fourth of July.

Distinguished officials in Washington, New York, Chicago and other cities held two-way conversations, and these were put on the air by the different stations in the network arrangement.

New Form of Applause

DAVENPORT, Iowa.—One member of WOC's audience has a unique way of sending in his applause. This fan in Clinton, Iowa, placed his loud speaker in front of a dictaphone and recorded a whole program, and then sent the record in to the chiropractic station at Davenport. The WOC staff got a bigger kick listening to that reproduction on their dictaphone machines than had they just got one of the usual stereotyped forms of applause.

The Allen-Bradley Line of Perfect Radio Devices



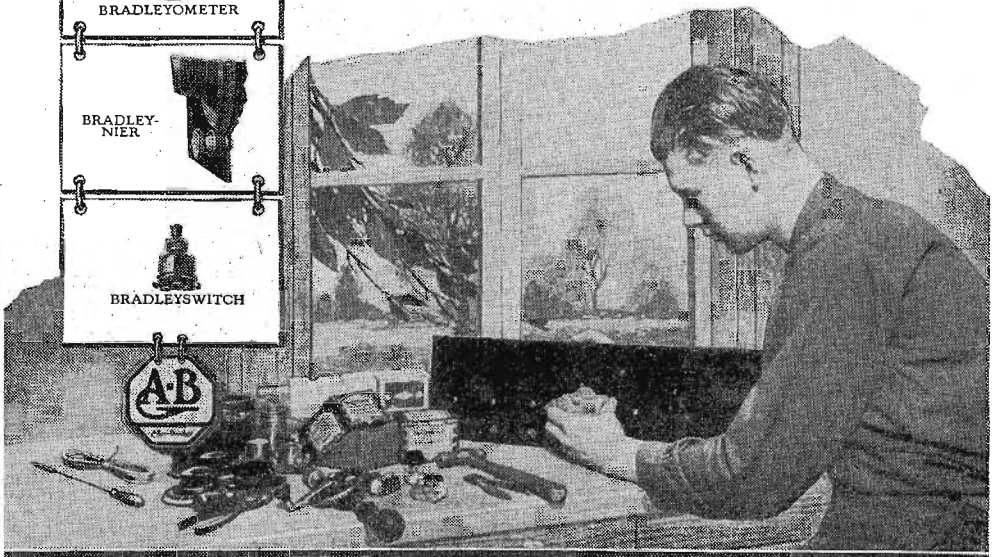
A distinctive series of radio units for set builders who seek superlative results.

EVERY amateur yearns for perfection in his radio receiver. Better quality, greater volume, and closer selectivity are the requirements of discriminating radio enthusiasts, and the circuits which meet these requirements are inevitable favorites.

The experienced set builder has learned the value of fine radio parts, and he knows the important part they play in getting maximum results from a selective circuit. Hence, it is not strange that the Allen-Bradley line has gained increasing popularity with the introduction of the super-selective hook-ups. In fact, for stepless, noiseless, perfect control, Allen-Bradley Radio Devices have no peers. Your set will be a better set if you use them. Let us send you an illustrated folder about the Allen-Bradley line.

Allen-Bradley Co.
Electric Controlling Apparatus
290 Greenfield Ave., Milwaukee, Wis.

Manufacturers of graphite disc rheostats for over twenty years



KDKA, the World's Pioneer Broadcaster



One of the brightest luminaries at KDKA—Christine Clemson.



The studio of Westinghouse KDKA. The entertainers broadcasting from this room are probably heard by more people and at a greater distance than any other station.



Above, H. P. Davis, vice-president of the Westinghouse company and "Father of Broadcasting." Below, Miss Alice King, soprano. Miss King is one of the best liked regulars.

THE ancient war lord who had conquered the then known world and sighed for more to conquer might be called a prototype of Station KDKA: for though this world's pioneer broadcasting station is being heard consistently in the furthestmost parts of the world, its engineers are still developing and improving its powerful transmitting set to reach still further distances—and thus increase the ease with which its programs can be heard by those who now get them daily in all parts of the globe.

Programs of this pioneer broadcasting station of the world are heard consistently in the British Isles, Germany, France, Belgium, Portugal, South Africa, Turkey, Australia, Tasmania, New Zealand, the Arctic Circle, and the South American countries, letters received by the station show, and the number of places in the world that are hearing the programs is constantly increasing. Australia is almost exactly on the opposite side of the world from the station at Pittsburgh.

These far-away lands are enabled to hear the KDKA programs through the station's international short wave relay system, by which many of the musical programs of the station are relayed, on the short wave length, at the same time they broadcast for the station's American audience on its standard wave

length. The listeners in the more distant countries pick up the programs from their local or nearest station which is relaying KDKA short wave signals.

While the station is heard consistently on its long wave length in most every part of the North American continent, the better carrying power of the short wave is needed to bring the programs to the other continent.

This station, although it is the pioneer one of the world, would be but five years old on election day next November, if there were an election then. The station started its regular daily broadcasting on election night in 1920.

From an improvised studio on the roof of the nine story building at the East Pittsburgh works of the Westinghouse Electric and Manufacturing company, with the broadcasting set and antenna nearby, the station has grown until today it has a building especially constructed of non-metallic material to house the powerful standard and short wave transmitting sets, a studio at the works, another at the plant of the Pittsburgh Post, in the center of the Pittsburgh downtown district, and another at the University of Pittsburgh and the National Stockman and Farmer, with special pickup lines from every large church and auditorium in the city. The station has grown too large for

its original staff, as it has for its original location and equipment. The original staff was the "Radio triumvirate" who established the station, vice president H. P. Davis, manager of publicity J. C. McQuiston, and assistant chief engineer Frank Conrad.

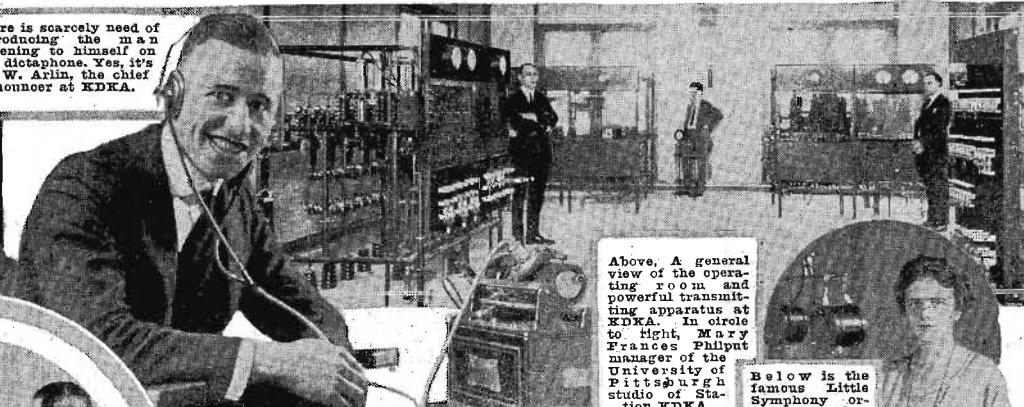
C. W. Horn, as superintendent of Radio operations for the company, now has supervision of all the Westinghouse stations, KDKA, WBZ, in New England, KYW in Chicago, and KFKB in Hastings, Neb. He is located at Pittsburgh and his pet is KDKA, chief development station of the four operated by the company. Mr. Horn served as a Radio officer in the navy during the war.

The program director of the station is G. Dare Fleck, who was connected with the Westinghouse department of publicity before the establishment of the station. Victor Saudek is musical director of the Westinghouse stations and conductor of the famous KDKA Symphony and KDKA Little Symphony orchestras. He was a flutist in America's large symphony orchestras and an instructor at the Carnegie Institute of Technology before he became connected with the station. T. J. Vastine is director of the famous Westinghouse Employees' Band.

H. W. Arlin, the world's pioneer announcer, is the chief announcer of the station at which he (Continued on page 6)

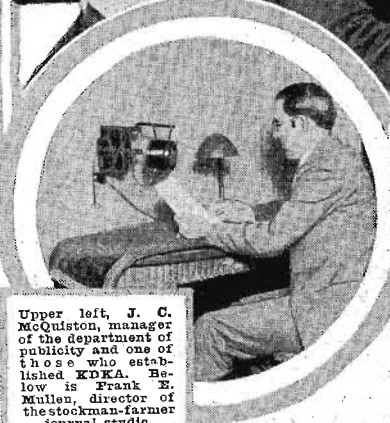


There is scarcely need of introducing the man listening to himself on the dictaphone. Yes, it's H. W. Arlin, the chief announcer at KDKA.

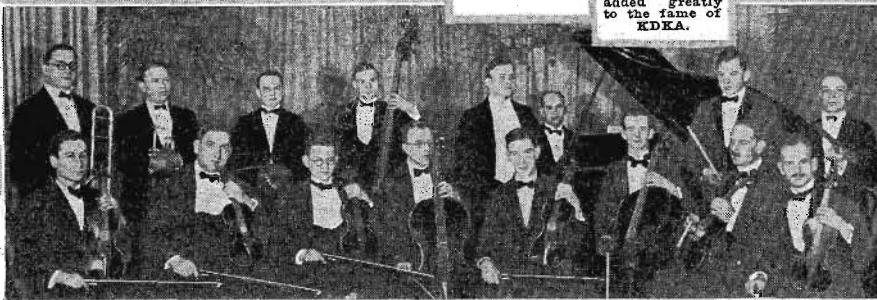


Above, A general view of the operating room and powerful transmitting apparatus at KDKA. In circle to right, Mary Frances Philipnt manager of the University of Pittsburgh studio of Station KDKA.

Below is the famous Little Symphony orchestra that has added greatly to the fame of KDKA.



Upper left, J. C. McQuiston, manager of the department of publicity and one of those who established KDKA. Below is Frank E. Mullen, director of the stockman-farmer journal studio.



VETERAN FIDDLER KING TELLS LIFE



Capt. M. J. Bonner Photo by Kerr

"Chicken in the bread tray
Shoo, fly, shoo,
Swing that pretty girl
An' I'll swing you."
"Now you're right and now you're wrong,
Swing that pretty girl all day long."

By Susan Haymes

THE sunshine of a summer afternoon cast golden beams along our path as we wended our way to the spacious Texas home of the world's champion fiddler, Captain M. J. Bonner. With true hospitality, the great oak door was opened by the Captain himself. Further greetings were extended by his estimable wife and mother of their two daughters and five sons.

Captain Bonner, seventy-eight, yet not appearing a day over fifty; here, indeed, is no senile doddler stricken with relentless years. Emphatically the opposite, his frame shows plainly that time has only seasoned him. His eyes are as bright as when they first sighted along his gleaming rifle barrel. And his back is as straight as the arrow shot after him by the Indians. Hair and goatee—grey, yes; but one, somehow, feels that always this has been their color. Trim, snugly shod feet, in a size that milady might covet.

KDKA, WORLD PIONEER

(Continued from page 5)

established the new profession of Radio announcing, and now there are several co-announcers for announcing the programs from the various studios. His exceedingly clear enunciation and clear, middle register voice, the "quiet American voice," as one Australian admirer calls it, have been great factors in making the station so popular to people in distant lands, especially the English speaking countries.

Fran. E. Mullen, whose "good evening," everybody, how you all tonight," is known from the trading posts of the Arctic coast to the equator, is director of the Stockman-Farmer studio. His summary of the day's news, given every week day at the closing livestock and produce market report period, has been the means by which isolated people such as the lonely sheep herders in the Rockies, and traders and trappers in the north country, have been able to keep in touch with daily events in the world.

Miss Mary Frances Philput, director of the University of Pittsburgh studio, is responsible for the courses of educational addressed given from that studio by members of the university faculty.

E. A. Boyd is director of the Post studio, the downtown studio, where most of the musical programs are broadcast, and he arranges the popular musical and theatrical programs broadcast twice a week after the theater closing time.

Vets' Hospital Completely Equipped with Radio Sets

FORT BAYARD, N. M.—The Radio installation in the U. S. Veterans Hospital No. 65, Fort Bayard, New Mexico, is unique, allowing as it does over 600 patients to listen, individually or collectively, to Radio programs broadcast from all parts of the nation. At the heads of 256 beds are installations for telephone head sets, this circuit being left open from 7:00 p. m. to midnight. Sixteen loud speakers throughout the assembly rooms and general wards are discontinued at 10:00 p. m.

Our talk drifted back to the stirring days of '63 when Bonner was a courier in the Twelfth Texas cavalry in "Buckskin" Parson's regiment; back to the days of buffalo hunts, cattle stampedes, hostile Indians and the long, long drives up the trail. He was younger then, and-if life was cheap, living was sweet.

Talked, also, of the old fiddlers' contests, when this veteran met all comers and was declared the winner. The Captain's pride is his fiddle and it is this sweet-toned instrument which has assisted in introducing him to the Radio public. "You will call it a violin, I reckon," he said. "No, we shall not," we retorted, remembering that a roose by any other name would be as sweet. The captain looked pleased.

"I've fiddled ever since I can remember," the aged fiddle king continued. "I learned from the negroes, playing 'round the cabin doors. The fiddle I play now is 387 years old and I've had it since I was eight years old, and that's seventy years back. It was pawned by its original owner, and brought over to this country by an old German, and through him it came into my possession."

Captain M. J. Bonner is frequently heard over WBAP, the Fort Worth Star-Telegram station. Here it was that he introduced, played and had called the first Radio square-dance program. So popular was this program that between four and five thousand telegrams and letters were received. On a later occasion, congratulatory telegrams came in every twenty seconds for an hour. Doesn't sound much like a jazz-mad world, does it?

"Requests come in every time I play," the fiddle champion said, "but it's best to try and go by your selected program. The favorites are "Figure Eight," "Three Little Sisters," "Sally Goodin," "Turkey in the Straw," "Arkansas Traveler" and "Leather Britches"—and I don't like that last un either, rather take a lickin' than play it," the Captain's eyes twinkled. "Do you know it?" he asked and he hummed it and patted his foot:

"Leather britches, full of stitches,
Mammy sewed the buttons on,
Daddy whipped me out of bed,
'Cause I had my britches on."

But Captain Bonner does not live and think only in retrospect—indeed, no! He is actively engaged in business and his plans are laid far into the future. Before the ink on this page is dry, he will have made records for one of the leading concerns of the country, and will be crossing the continent to fill other engagements.

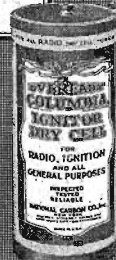
Records of the old songs, "lonesome tunes" and square dances—which generations yet unborn will cherish; tunes that were prime favorites in this country when your grandmother and ours were young. Truly American folk songs are these.

Head Sets Replace Loud Speaker in Train Coach

CINCINNATI—While it is no longer a novelty for trains to be equipped with Radio receiving equipment, a number of cars of the Louisville and Nashville railroad here are equipped in an unusual manner. Instead of having a loud speaker in the coach, individual headphones are attached to plugs in the sides of the car walls, just above the seats.

EVEREADY HOUR EVERY TUESDAY AT 8 P. M. (Eastern Standard Time)
For real radio enjoyment tune in the "Eveready Group," Broadcast through stations—
WBAP New York
WJAR Providence
WEBI Boston
WFI Philadelphia
WGR Buffalo
WCAE Pittsburgh
WEAR Cleveland
WSAI Cincinnati
WJL Detroit
WCCO Minneapolis
WOC St. Paul
Davenport

Eveready Columbia Ignitor Dry Cell for all Radio Dry Cell Tubes 1½ volts



No. 766 22½-volt Large Horizontal Price \$2.00



No. 772 45-volt Large Vertical Price \$3.75

Get a good set— and Evereadys

To ENJOY radio for the rest of your life, get the best set you can afford. There are receivers at all prices, made by reputable manufacturers; it isn't necessary for anyone to get 'round-the-corner, unproved, unreliable merchandise at any price. That applies to batteries too. Eveready Radio Batteries are made in so many sizes and prices that there is a correct, long-lasting Eveready for every receiver and for every radio home, ship or commercial station. Specify Evereadys for your new radio set. It is false economy to buy nondescript batteries at any time. In the long run you'll find it most economical to buy either the large or extra large Evereadys. Always buy Evereadys and enjoy the knowledge that no one can get any more in batteries for the money than you. There is an Eveready dealer nearby.

Manufactured and guaranteed by NATIONAL CARBON CO., Inc. New York San Francisco Canadian National Carbon Co., Limited Toronto, Ontario

EVEREADY Radio Batteries —they last longer



No. 771 4½-volt "C" Battery improves quality, saves "B" Batteries Price 60c.



GIVE FAREWELL TO POLAR NAVIGATORS

WHT HOLDS PROGRAM FOR BIG ARCTIC EXPEDITION

Broadcast for Adventurers as "Bowdoin" and "Peary" Prepare for Long Journey

CHICAGO—A special farewell program dedicated to Lieut. Commander Donald B. MacMillan's polar expedition was broadcast from Superstation WHT, Wrigley building, Chicago, on Wednesday night, June 17, between the hours of midnight and 1 a. m.

Rev. Gardner MacWhorter was in charge of the program arrangement and arranged farewell speeches by Capt. Waldo Evans, commandant of the Great Lakes Naval Training station, former mayor William Hale Thompson, Frederick Clerk, superintendent of New Trier high school and life long friend of Lieut. Commander MacMillan.

The WHT program consisted of Revolutionary war songs, classical and popular music, vocal solos and Husk O'Hara's Red Dragon orchestra in an appropriate selection of melodies.

The two ships in the MacMillan expedition left Boston harbor at noon June 17 as the main feature of the Bunker Hill Day celebration.

Thirty-Three to Sall

Among those aboard the S. S. Peary and S. S. Bowdoin, and to whom the program was dedicated, are: U. J. (Sport) Hermann, manager of the Cort theater; Lieut. Commander Donald B. MacMillan, Lieut. Com. Eyrd, U. S. N., who will be official observer for the Navy department and will be in charge of the three amphibian planes carried by the expedition; Lieut. Com. Eugene F. MacDonald, U. S. N. R., who will command the Peary; Capt. John Steele, an experienced polar navigator, who will command the Bowdoin; Ralph Robinson, first assistant to Commander MacMillan; John M. Jaynes, chief engineer, and a crew of twenty-four.

John L. Reinartz, short wave expert, was appointed way last January as first operator in charge of Radio on the MacMillan arctic expedition. Since this appointment, Commander MacDonald combed the entire United States in an endeavor to find a second operator who would be in charge of Radio on board the S. S. Peary and who would also be in charge of the advance airplane base.

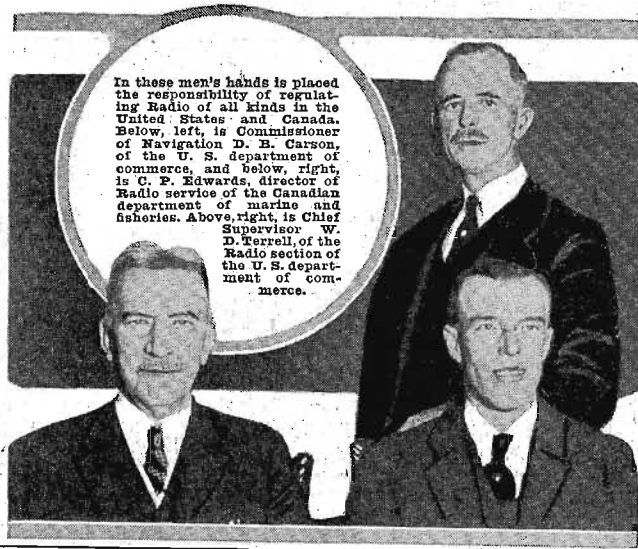
Paul J. McGee, a Radio engineer in Zenith's own organization, was discovered to possess exactly the qualifications needed and was appointed to the position.

Amateur Hears Bowdoin

BIRMINGHAM, Ala.—John H. Newman, Radio amateur of Mobile, Ala., is believed to be the first amateur in Alabama to pick up Lieut. Commander MacMillan's ship, the Bowdoin, as it was preparing to enter the Arctic ocean. He kept in communication with the vessel for some time.

Mr. Newman heard the Bowdoin's signals shortly after midnight on a 40-meter wave length.

U. S. AND CANADIAN RADIO BOSSES



In these men's hands is placed the responsibility of regulating Radio of all kinds in the United States and Canada. Below, left, is Commissioner of Navigation D. B. Carson, of the U. S. department of commerce, and below, right, is C. P. Edwards, director of Radio service of the Canadian department of marine and fisheries. Above, right, is Chief Supervisor W. D. Terrell, of the Radio section of the U. S. department of commerce.

Largest Organization of Fans Is in London

League Has Free Insurance for Sets of Members

LONDON, England.—Little doubt now remains that the wireless league recently formed here will soon be the largest association of Radio fans in Europe, if not in the world.

The primary object of the league is to obtain for the listener a voice in the management of broadcasting and to protect him against any interest or authority which tries to impose upon him. The second object of the league is to provide practical, technical and legal assistance for members by means of expert advice.

The league has arranged for its members a free insurance covering damage by fire or lightning of Radio sets, aeriads, and accessories up to a value of \$125, and third party risks (persons and property) in connection with Radio sets and aeriads up to \$500 in respect of any one accident.

NEW ETHER LAWS BEING PREPARED?

Department of Commerce Has Judge Davis Busy on Bill, Is Report

WASHINGTON, D. C.—By the time the next session of congress convenes it is expected that the department of commerce will have some interesting suggestions to make.

It is understood that even at this early date Judge Davis, solicitor of the department, has commenced the draft of a Radio bill. He refuses to discuss at this time any of the provisions of the proposed bill.

Czechoslovakian Station

WASHINGTON, D. C.—An American firm has been awarded the contract for erecting a new broadcasting station at Prague by the government of Czechoslovakia. The new station will cost about \$90,000 and take six months to complete.



Few listeners realize just how the equipment in a broadcast station functions. The voice is first picked up by the microphone in the studio.

BROADCAST AT WGY ON 4 WAVE LENGTHS

1660 TO 38 METER RANGE IS USED FOR EXPERIMENT

Ask Fans to Report Reception Obtained on Different Waves for Research Work

SCHENECTADY, N. Y.—All programs of WGY here may now be found on four wave lengths. Experimenters in the field of Radio are thus afforded an opportunity to compare the same program under similar conditions, but with differences in power and frequency.

Evening programs of the General Electric company's eastern station, are going out on four channels as follows: WGY, 379.5 meters; 2XAF, 38 meters; 2XK, 109 meters; 2XAH, 1,660 meters. The last three groups of call letters are special experimental licenses of the company.

Continue Research

In broadcasting on higher and lower wave lengths than those provided in the band assigned by the government to broadcasting stations the General Electric Radio engineers are pursuing an exhaustive research into the problem of transmission under all conditions of service, daylight and dark, summer and winter, under various degrees of power and with a variety of antenna arrangements.

Radio fans who are equipped to receive the higher and lower wave lengths are asked to report to the engineers on their reception with particular reference to quality, fading, and strength of signal on different wave lengths. For example, if the signal on the 38 meter wave length rides through clearly while the 379.5 signal of WGY is blasted by static or smothered by fading, the engineers will be very much interested in knowing about it. Your report may become an important factor to them in solving some of the many perplexing problems of Radio transmission.

TIGHT PURSE STRINGS DELAY FARM CENSUS

Congress Allows No Money to Tabulate Radio Data

WASHINGTON, D. C.—Because of lack of sufficient money from congress, the farm Radio census which was recently taken by the bureau of the census for the first time, cannot be tabulated and made public.

All of the data has been collected but it will cost several thousands of dollars to tabulate and disseminate this information. Sufficient funds are not available.

Director Stewart of the bureau has gone before the bureau of the budget asking that the proper funds be made available next year. At best, however, the information collected, will be a year later in being made public than it should have been.

Farm Council to Survey Farmer's Taste in Radio

CHICAGO—During July and August the National Farm Radio council will conduct a survey of farm homes to determine the type of Radio programs desired by farm listeners. Other Radio surveys have been made by various organizations but they have been concerned with the number and nature of receiving sets rather than with program material. Questionnaires will be placed in the hands of 850,000 farmers.



By means of this meter it is possible to note any distortion, which is immediately corrected so that it registers on the receivers perfectly.

After the voice is picked up it is amplified thousands of times before it enters the transmitter by means of the speech input amplifier shown above.

The voice now enters this huge 500-watt transmitter. Note the 250-watt vacuum tubes with the four usual prongs on base. They are built like receiving tubes.

ELKS MEETING BROADCAST BY KGW

Sunday, July 12

(Continued from page 3)

White: J. Amy K. Whittier, organist; Nora LaMar Moss, contralto; Tobias Young, tenor; 0:15, sermon, Ralph W. Farrell.

KTHS, Hot Springs National Park, Ark. (374.8), 11 a. m. to 12 p. m. services, First Presbyterian church, Rev. Clarence Hefner, pastor; Frances Hardin, organist; 2:15-3:05, baseball; 3:45-10, classical concert, New Arlington-Miyor Davis ensemble, Lou Chassy, conductor.

KYW, Chicago, Ill. (536), 10-11:30 a. m., Second Presbyterian church; 3-4 p. m., Revue American studio.

WCOB, Zion, Ill. (344.5), 8 p. m., Zion orchestra, orchestra bell quartet; George Bogen, marimba soloist; Mark Whitehead, bassitone; H. E. Mayfield, soprano; Dorothy and Ralph Hull, soprano and alto.

WCCO, Minneapolis-St. Paul, Minn. (416.4), 11 a. m., Westminster Presbyterian church; 4:10 p. m., House of Hope Presbyterian church; 7:30, Second Church of Christ, Scientist; 9, baseball; 9:15, classical concert.

WDAF, Kansas City, Mo. (385.8), 4-5 p. m., classical music; 5:30, Sunday school lesson, Dr. Walter L. Wilson.



Robert H. Prutting, organist and choir-master of the First Methodist church and professor of theory at the Hartford Theological seminary is broadcasting the organ concerts Tuesdays at WYIC, Hartford.



Dorothy Dunyon, violinist, will broadcast from KGO, Saturday, July 11. Albertine Schmidtke, soprano, is as vivacious and pretty as she sounds over the microphone of WWJ, Detroit.

WFAA, Dallas, Texas (475.6), 6:30-7:30 p. m., Radio Bible class; 10, William Anderson; Bible study, gospel song; 8-9, City temple service; 9:30-11, Postscript, popular music.

WHAS, Louisville, Ky. (389.8), 9:57 a. m., organ music; 10, services, Broadway Baptist church, Rev. Russell Pirko, pastor; 11, services, First Baptist church; Teresa Trout, soprano; Aurelio McCreesh, contralto; Charles Barnes, tenor; William Conway, baritone.

WHO, Des Moines, Iowa (326), 11 a. m., University church services; 7:30-10, music.

WNC, Memphis, Tenn. (292.8), 11 a. m., services, St. Mary's Episcopal cathedral.

WDAW, Omaha, Neb. (325), 9 a. m., chapel service, Rev. R. H. Brown; 9, chapel service, Hope Mission church.

WOC, Davenport, Iowa (483.6), 8:30 p. m., Methodist Episcopal church, Rev. Walter E. Day.

WORD, Batavia, Ill. (275), 10 a. m., service to 11 a. m., hymns, sacred songs, lit. and dir.; B. F. Hollister, Burr Rice; Edna Keane, D. J. Moreshead; 9:30, 10, 11, services; S. I. B. S. A., vocal singing; Eva Holbrook, organist; Carl J. E. Rutherford.

WOS, Jefferson City, Mo. (440.3), 3 p. m., Union religious services from Capital.

WTAS, Elgin, Ill. (302.8), 5-5 p. m., Sunday afternoon number concert; 8:12, Joe Rudolph and the Boss' Own orchestra; Healy Mae, Ned Becker, Gail Bandler.

WIP, WJY, WKAC, WBS, WMAQ, WMBS, WOC, WOAI, WOI, WRD, WRO.

Atlantic or Eastern Daylight Saving Time Stations

CHNC, Toronto, Can. (356.2), 8 p. m., CHNC orchestra; Gerard J. Kelly, tenor; Dwight Tyson, baritone.

WANG, Richmond Hill, N. (315.3), 7:30-7:45 p. m., sports talk, Thornton Fisher; 7:45-8, Mrs. Amy Mitchell, soprano; 8:15-8:30, Howard J. Taylor, reader; 8:35-9, Southwestern string trio; 9-9:15, Norman Gray, pianist; 9:15-9:30, Mrs. Amy Mitchell; 9:30-10, Southwestern string trio; 10-10:30, dance music; 11:00-11:30, dance music.

WBBR, New York, N. Y. (272.6), 3 p. m., Syrian Oriental selections, Pacific Orchestra and Elizabeth Avard; 8:10, vocal selections; 8:30, World News Digest; 9:30, vocal selections; 9:40, "The Stars of God," Bible instruction; 9:50, Syrian Oriental music.

WCAE, Pittsburgh, Pa. (461.3), 8:30 p. m., dinner concert, William Penn hotel; 8:30, concert; 9, concert, Sanders Inn; 10, dance music, Sanders Inn.

WEAF, New York, N. Y. (491.5), 4-4:15 p. m., Moonlight instrumental trio; 4:15-4:30, "Indian Legends," Marie Collins Rooney; 4:30-5, Moonlight instrumental trio; 6-7, dinner music, Waldorf-Astoria; 7-7:15, William Gomer, baritone; 7:15-8:30, program, Mark Strand theater, studio under direction of Joseph Phinetti; 8:30-9:45, Vera Curtis, soprano; 8:45-9, Harold Belle, Metropolitan Life Insurance company; 9:15, Goldman band concert; 10-10:30, Giuseppe di Benedetto, tenor; 10:30-11:30, Hotel Bossert Marine rock orchestra.

WFI, Philadelphia, Pa. (394.5), 1 p. m., Bellevue Stratford concert trio; 3, Loreta Kern, pianist; 6:45, Bellevue Stratford roof garden show.

WGBS, New York, N. Y. (315.5), 3-3:10 p. m., tennis talk; 3:10-3:30, Sam Diamond, blind pianist; 3:30-3:50, "Close-up of John Barrymore," Arthur William Ross; 3:50-5:30, Sam Diamond; 5:30-5:50, recitations, Beatrice Miesler; 5:50-6, Sam Diamond; 6-6:20, Uncle George; 7-7:10, Captain Archibald's viewpoint of Major General Rockefeller of General Pershing's staff.

WGR, Buffalo, N. Y. (819), 2:30-4:30 p. m., WGR's afternoon program; 6:30-7:30, Olympic dance orchestra; 9-9:30, piano recital, Mrs. Carl J. Dieckman; 9:30-10, John Dodsworth, reader; 10-11, popular program, Royal Arcadian; 11-11:30, supper-dance music, Vincent Lopez Hotel Stadler dance orchestra, Harold Gleser, director.

WMAF, Atlantic City, N. J. (275), 7:30 p. m., address, S. Seaside hotel trio.

WHN, New York, N. Y. (360), 7:30-9 p. m., Alla and his WNY orchestra; 8-8:05, "Storage Batteries," H. B. Shontz; 8:05-8:35, Roseland dance orchestra; 8:35-9:15, H. W. Carrough, Terminal Barber Shop; 9:15-11:30, organ recital, George Letchford, tenor; 12-12:30 a. m., Harry Richmond and his Club Richmond orchestra.

Fall; 10:45-11:45, Jacques Green and his Club Denaville orchestra.

WLIT, Philadelphia, Pa. (384.5), 12:02 p. m., daily almanac; Stanley theater organ recital; Arcadia cafe concert orchestra; 3, Arcadia cafe concert orchestra; 4:30, Marcelita North, pianist; 7:30, Pyram Doubt's bedtime stories; 9, Stanley theater hour; moving picture review, James A. Nassau; 10, Arcadia cafe dance orchestra.

WMA, New York, N. Y. (340.7), 3-3:10 p. m., Ben Bernard, tenor; 6:30-7:30, Ernie Golden and his Hot Melodin orchestra; 8-9, lecture, First Church of Christ Scientist; 9-9:30, Lafayette male quartet; 10-10:30, Hot Melodin Radio Organ.

WNVC, New York, N. Y. (528), 8:50-7 p. m., market high spots; 7-7:25, Original Charleston River; 7:25-7:30, baseball results; 7:30-7:35, police alarms; 7:35-8, Original Charleston River; 8-8:15, "Knotty Problems in Baseball," John B. Foster; 8:15-10:15, concert, Martin's band; 10:15-10:30, "Trend of the Times," Dr. Sydney N. Fisher.

WOO, Philadelphia, Pa. (508.2), 11 a. m., organ recital, Mary E. Vogt; 12:02 p. m., Golden's crystal tea room orchestra; 4:15, organ recital; 7:30, S. Candelaria's concert orchestra; 8, Mark Strand theater concert; 9, Goldman band concert, Walter Kaupff, conductor; 10:15, Giuseppe di Benedetto, tenor; 10:30, Hotel Bossert Marine rock orchestra.

WOR, Newark, N. J. (465.2), 6:15-7:15 p. m., Ernie Krickert's Cinderella orchestra; 7-7:30, sports talk, Bill Wahey; 8-8, Newark Philharmonic band; 9-10, Al Reid's hour; 10:45-11:30, the Commanders.

Eastern Standard or Central Daylight Saving Time Stations

KCKA, Pittsburgh, Pa. (309.1), 2:30-5 p. m., baseball; 7, baseball; 8:45, concert.

WEL, Springfield, Mass. (333.3), 5 p. m., Drummer, Capitol theater orchestra; 8:30, baseball; 9:30, Capitol theater orchestra; 8, concert, Alamo drum corps; 8:30, concert, Apollo Duo; Gertrude Anderson Wood, contralto; Eric Anderson, tenor; William Burbank, accompanist; 9, Ethel Hanson, soprano; Marguerite Stephens, accompanist; 9:20, Lena G. Evans, pianist; 9:30, book review, Bennett B. Schneider; 9:50, baseball.

WCEE, Elgin, Ill. (275), 10:30-12 midnight, Joe Rudolph and the Boss' Own orchestra; Frank Morris, soloist; 10:30, lecture, John Dodsworth, bass; Edna Harge, pianist; 11:15-11:30, news and market; 11:30-11:45, dinner concert, Book Cadillac hotel; 7:30, municipal band concert, Belle Isle; 8:30, musical program.

WCEA, Cleveland, Ohio (386.4), 7-8 p. m., musical program, Cleveland State theater.

WGES, Oak Park, Ill. (240), 5-7 p. m., Mrs. Bernard Nichols, lecturer; John McFarlane, bass; Edna Harge, pianist; Andrea Scariatti, tenor; Cecile Electrical School orchestra.

WGY, Schenectady, N. Y. (378.5), 5:30 p. m., John McFarlane, tenor; Cecile Electrical School orchestra; Poetry Profits and Improved Methods," R. C. O'Leary; 6:30, WGY orchestra; Leslie and Blake, contralto.

WHAZ, Troy, N. Y. (378.5), 8-15 p. m., vocal quartet; Isabelle Vere, soprano; Ada B. Webster, contralto; William Van Arman, tenor; Jean G. Field, bass; Frank Williams, accompanist; Mrs. John Vaughn, reader; Eric Vincent, violinist.

WHI, Oberlin, Ill. (336.8), 7 p. m., classical program; Al Carney, organist; Kitcher Klenzer Klaska; Lillian Knowles, contralto; Northland trio; 7:30, Leola Alkman,

soprano; John Clark, baritone; 8:15, Elmer Kaiser's Riverbank Park ballroom orchestra; 10:15, numbers from WITT; 10:30, Chicago Boaters; Al Carney, organist; David Boyd, whistler; Ceila Hoffman; 11, Walter Donovan, tenor; Carl Stuckenberg, harmonica soloist; 11:30, harmony ballads; Milton Grossman, saxophonist; Hue O'Leary's Red Dancers orchestra; 12, Pat Barnes, Irish melodies; Untoza specialist; Johnny Bluff; 12:30 a. m., Al Carney, organist; 1, Al Carney, music and talk.

WJD, Meacham, Ill. (302.8), 6:45-7:15 p. m., dinner concert; 7:15-8, Meacham Novelty orchestra; Belmont hotel trio; 10:30-11 a. m., Chaeley Straight and his orchestra; Albert S. Brown, organist.

WKR, Cincinnati, Ohio (328), 3 p. m., musical program, members Robert J. Bentley Post, American Legion; G. Caldwell and Taylor Original Novelty Orchestra; 4, Cincinnati, Ohio (423.3), 2 p. m., dinner hour concert, Hotel Gibson orchestra, Robert Viscotti, director; 7:30, dance music, accompaniments by Benish Barrett, S. popular program, Liggett Club Heavers; Larch Peterson, baritone; median pianos, Margaret Center; organ solo, Cyril Buschka.



WMAK, Lockport, N. Y. (265.3), 8:30-10:15 p. m., music, Max Freedman.

WMBF, Miami Beach, Fla. (384.4), 6:30-7 p. m., Fleetwood Radio orchestra; 7-7:30, Fleetwood Radio orchestra, specialties.

WRC, Washington, D. C. (468.5), 6-6:25 p. m., United States Navy band.

WSAI, Cincinnati, Ohio (325.5), 10 p. m., Arthur Kuhlman, baritone; Norma Richter, soprano; Herman Boardman, violinist.

WTAM, Cleveland, Ohio (389.4), 6-7 p. m., Golden Pheasant orchestra; 8-9, instrumental hour, Willard orchestra; 9-10, studio program; 10-11, symphony program; 11-12, Radio Beach dance orchestra.

WTAS, Elgin, Ill. (302.8), 8-10:30 p. m., Joe Rudolph and the Boss' Own orchestra; Mistinguett Miltar; Bee Lephman; Phil Wycox.

WTLG, Hartford, Conn. (348.6), 6 p. m., Emil Heuserberger's Hotel Bond trio; Mrs. Alice Evans Waesche, contralto; 6:30, baseball; 6:55, dinner music.

WWJ, Detroit, Mich. (322.7), 8 p. m., dinner music.

Central Standard Time Stations

KFAB, Lincoln, Neb. (240), 7:30-9:30 p. m., Budd Hass, reader; Clyde Davis, violinist; Otto Kompf, baritone; Edward entertainers.

KNF, Shenandoah, Iowa (266), 7:30 p. m., concert, Harrison Field, organist.

KFRU, Bristol, Okla. (354.5), 7-8 p. m., Oklahoma educational hour; 8-10:25, music.

KFV, St. Louis, Mo. (545.1), 8 p. m., "A Life of Prayer."

KFY, University City, Mo. (240), 7-8 p. m., Radioconcert; 8:15, Star Melody boys.

KGL, Grant, tenor.

KSL, St. Louis, Mo. (545.1), 9 p. m., concert, Azzo-Lins's band.

KTHS, Hot Springs National Park, Ark. (374.8), 9:15-9:30 p. m., baseball; 9:35, dance concert, Ray Mullins Como hotel roof garden orchestra.

WCBD, Zion, Ill. (344.6), 8 p. m., mandolin and guitar band; chorus, mixed quartet; John D. Thomas, baritone; Erna Reynolds, soprano; Misses Sweeney and Nauffinger, Mrs. Crown vocal; Erwin Handall, tenor; piano trio; Theodore Posty, reader.

WCCO, Minneapolis-St. Paul, Minn. (416.4), 6 p. m., baseball; 6:45, F. & X family; 9, weather, baseball; 10, Star Melody boys.

WDAF, Kansas City, Mo. (385.5), 3:50-4:30 p. m., Newman and Royal theater; 6-7, piano tuning-in number on the Due Art; Cecile Burton, reader; 6:15-6:30, information program; Plantation players; 11:45-11:55, Henry Old Chief and Plantation players; Gantley Dornberger's Kansas City Athletic club orchestra; Kansas City Athletic club orchestra.

WFAA, Dallas, Texas (475.6), 6:30-7:30 p. m., Artie Collins and his Jolly Pirates; 8:30-9:30, Lilia Griffin, pianist.

Mountain Standard Time Stations

KFWA, Ogden, Utah (261), 8-11 p. m., musical program, Chapter of Conscience.

KOA, Denver, Colo. (322.4), 11:30 a. m., Augustana Lutheran church; 4 p. m., organ recital, Augustana Lutheran church; 8, Augustana Lutheran church.

Pacific Standard Time Stations

KFWB, Hollywood, Calif. (232), 9-11 p. m., late news and Warner Bros' movie trailer, presenting some Warner Bros. comedy celebrities.

KGO, Oakland, Calif. (361.2), 11 a. m., First Presbyterian church; 3:30 p. m., CHH hotel concert orchestra; First Presbyterian church.

KGW, Portland, Ore. (491.5), 10:30-11 a. m., First Presbyterian church; 7:15-9, First Church of Christ, Scientist.

KHJ, Los Angeles, Calif. (405.2), 6-6:30 p. m., Light-toned Avenue coffee orchestra; Jack Crenshaw, Reader; 6:30-7, Al Hekman's Billmore hotel concert orchestra; Edward Fitzgerald, director; 7-7:30, Arthur Hickey, organist; 8-10, program, Aladdin Music company, arranged by J. Howard Johnson.

KNK, Hollywood, Calif. (358.9), 7-8 p. m., First Presbyterian church; 8:10, program, 27 real estate, Stewart P. MacLennan, pastor; 8-9, Ambassador hotel concert orchestra; 9-10, program, 27 real estate, Stewart P. MacLennan, pastor; 9-10:30, program, Beverly Hills Nurseries, the Lubovitch string trio.

KPO, San Francisco, Calif. (428.3), 6-6:30 p. m., States restaurant orchestra; 6:30, baseball scores; 6:45-7:30, Palace hotel concert orchestra, Cyrus D'Almeida, director; 8-8:30, Palace hotel concert orchestra; 8:30-10, Judy Selzer's Fairmont hotel orchestra.

Monday, July 13

Monday, silent night for: CKAC, CBRT, KEFE, KFNH, KGW, KHJ, KLDK, KYW, PWK, WBAV, WBBN, WBCN, WDAU, WDFW, WFAO, WBBB, WBBJ, WFL, WGN, WGBS, WGES, WHEAD, WIBO.

(Continued on page 10)

JAZZ PROGRAM THURSDAY AT WSMB

Tuesday, July 14

(Continued from page 10)

WTAM, Cleveland, Ohio (393.4), 6-7 p. m., Hotel Statler concert orchestra.

WTAS, Elgin, Ill. (302.9), 8-10:30 p. m., WTAS orchestra; *Spice Sisters*; *Estelle Miller*; *Viola Eaton*.

WTIC, Hartford, Conn. (348.6), 8 p. m., *Travelers Jongleurs*; 8:30, *baseball*; 8:45, *Travelers Jongleurs*; 9:30, *Asiatic Organ company*; 9:50, "Fire Hoovers," Chief John C. Moran; 8:45, *Colt Park Municipal orchestra*.

WWI, Detroit, Mich. (352.7), 6 p. m., dinner concert; 7, concert from **WBAE**.

Central Standard Time Stations

KFAB, Lincoln, Neb. (240), 5-9 p. m., *Knaumler & Mueller program*; 11-12:30 p. m., *midnight romancers*.

KFDM, Beaumont, Tex. (315.6), 7-7:30 p. m., children's program; 8-10:30, musical program.

KFMQ, Fayetteville, Ark. (299.8), 9 p. m., musical program, *The Schult*.

KFRU, Bristol, Va. (394.5), 10:30-12 midnight, *feature trip*.

KFVU, University City, Mo. (240), 7-9 p. m., *Radio-cast review*, *Romaine Fielding*, 10, popular request numbers, *Jack*, *Billie* entertainers.

KIDS, Independence, Mo. (441), 8 p. m., Mrs. Arthur Hildes, soprano; Mrs. W. C. Newman, contralto; Mr. W. C. Norman, tenor; *Wesley Brown*, saxophone; *Mrs. Clarence Koenig*, soprano.

KSD, St. Louis, Mo. (345.1), 8 p. m., *Sophisticates*, *Walter*, *Alvin*.

KTHS, Hot Springs National Park, Ark. (374.8), 9:25 p. m., organ recital; *Lawson Field*, *Princess theater*.

KYW, Chicago, Ill. (289), 8 p. m., children's bedtime story; 6-6:30, dinner music; *Congress hotel*; 7-7:20, *Georgia McCreary*, soprano; *Frances Kaufman*, contralto; *Mrs. Alice M. Welton*, soprano; *Miss J. J. 7-7:45*, *Northwestern Farm Bureau Extension*; "Ideal American Farm Homes in the Middle," *Frank B. White*; 7:45-8:30, musical program; 8-10:30, evening at home.

WCCO, Minneapolis-St. Paul, Minn. (418.4), 8:05 p. m., *Edith*, Mrs. Paul hotel orchestra; 9, program from **WBAE**; 9, *baseball*.

Janet Maloon, soprano; *Irene Poljan*, pianist; *Florence Ruth Brown*, contralto; *Olen Chamberlain*, tenor; *Mary Tassone*, violinist; *Kaethe* trio; *Radio male chorus*; *Bernard O'Brien*, baritone; 10-11 a. m., *Clare Wilcox's Hotel St. Francis dance orchestra*.

KGW, Portland, Ore. (481.5), 8-10 p. m., *Detroit Elks band*; 10-11, *Wesley & Powell*; 11-12, *Herman Kenner's Multnomah hotel dance orchestra*.

KHJ, Los Angeles, Calif. (405.2), 5:30-6 p. m., *Lehigh 6*; *Arado caterina orchestra*; *Jack Cronshaw*, leader; 8-8:30, *Art Hildeman's Billmore hotel concert orchestra*; *Edward Fitzpatrick*, director; 8:30-7:30, weekly visit of *Green Tiliash* and *Sandman* from *Festland*; *Uncle John*, *Chas. Hill*, readings; *Florence Thompson*, soprano; 8-10, program, *Radio dealers*.

Vivis; *Loretta Kerk*, pianist; 8:45, *Bellevue Stratford roof garden trio*.

WGBS, New York, N. Y. (316.6), 9-10:10 p. m., "How to Place a Manuscript," *Hugh Herbert*; 3:10-3:30, *Frank Ludwig*, pianist; 3:30-3:50, talk on industrial art; *Lillian Haran*; 4:30-5:30, *Frank Loucks*; 5:50-6:30, "How to Grow Thin," *Georgia Jeffner*; 6-6:30, *Earl Gibson*; 6:30-7, *Palmadamas orchestra*; 7-7:10, *Pied Veer*, tenor; 7:10-8, *Palmadamas orchestra*.

WGR, Buffalo, N. Y. (316), 2:30-3:30 p. m., *WGR's afternoon program*; 8:01-8:30, dinner musical trio piano recital; *Gospel melodies*; 9-10, musical program, *Vincent Brown* and assisting artists; 10-10:30, program, *Royal Mulsan*, pianist; 10:31-11, vocal program, *Mrs. Robert Schaefer*, *Mrs. Gilvort Weimar*; 11-11 a. m.,

accordionist; *Marie Winters*, pianist; *Charlie Garland*, pianist.

WZL, Springfield, Mass. (333.3), 6 p. m., dinner concert; *Hotel Kimball trio*, *Jack Geers*, director; 8:30, *baseball*; 8:30, *Radio Nature story*, *Thomson W. Burgess*; 9, program, *Lionel P. Spencer*; 9:30, program, *radio selections*; 9, *Hotel Drumstick*, orchestra; 9:30, *baseball*.

WCE, Elgin, Ill. (275), 10:30-12, *midnight*, *Joe Rudolph and the Boss's Own orchestra*; *Frank Morris*, *Philo White*, *John Post*, *Eddie Caranagh*.

WCX, Detroit, Mich. (618.3), 2:30 p. m., municipal band concert; *Belle Isle*; 3:15, concert; 6, dinner concert, *the Bank-Cadillac hotel*; 7:30, municipal band concert, *Belle Isle*; 8:30, musical program.

WEAD, Columbus, Ohio (253.9), 8 p. m., "The Wheat Harvest," *D. M. Cash*; *Alenworth string quartet*.

WEAR, Cleveland, Ohio (388.4), 7-8 p. m., dinner concert, *Hotel Cleveland orchestra*, *Ivan Francis*, conductor.

WEHI, Chicago, Ill. (370.2), 7:30-8:30 p. m., *Orlois orchestra*; *books of the day*, *Levelyn James*; *Fluorene Behrens*, soprano; *baseball*; 8:30-10:30, *Orlois orchestra*; *Robert York*, tenor; *Correll and Gosdin*, songs; *South American Troubadours*; 11:30-11:45, *Orlois orchestra*; *Robert York*, tenor; *Correll and Gosdin*; *Kay Ross*; *Orlois orchestra*.

WGES, Oak Park, Ill. (280), 5-7 p. m., *Jean Bernstein*, pianist; *Margaret Gray*, reader; *Marie Wright*, soprano; *John Stortford*, tenor; *Louise Wyle*, soprano; 10:30-11 a. m., *Canali's orchestra*; *Andrea Scattoli*, tenor; *Ralph Olson*, moonlight serenaders; *Coyne Electrical School serenaders*.

WGN, Chicago, Ill. (370.2), 5:30 p. m., *Skeezix string quartet*; 7:30, *Drake Hotel Terrace Grand program*; 8:30-9:30, *radio program*; *Wren recital*; 10:30-11:30, *Drake Hotel Terrace Grand program*.

WGY, Schenectady, N. Y. (379.5), 8:35 p. m., *Albany Strand theater orchestra*; 7, "The Relation of the Church and the Stage," *Rev. W. L. Bentley*.

WHT, Desfield, Ill. (380.8), 7-10:15 p. m., concert, *Royal Klezmer Klezmer*; *Oscar Heatter*, tenor; *Herman Kitchin*; *Paul Baranek*, tenor; *Julie musical moments*; *Paula Sachs*, soprano; *Riverview Park ballroom orchestra*; 10:30-11 a. m., *Chicago Boosters*; *Al Carney*, organist; *Eust O'Brien's Rambler orchestra*; *Marye Lansing*, soprano; *Fred Agard*; *Al Carney*, organist.

WJD, Meesehall, Ill. (302.8), 6:45-7:15 p. m., dinner hour concert, *Midland hotel trio*; 7:15-8, *Mooseheart Philharmonic orchestra*; *Mooseheart Junior band*; "Child Care," *M. P. Adams*; 10:30-11 a. m., *Charley Straight and his orchestra*; *Albert F. Brown*, organist.



Catherine Jackson, left, is one of the west coast's premier harpists. She is a popular guest at KDKA, Los Angeles. William Anderson, Hawaiian steel guitarist, will be heard at WGBS, Friday and Saturday. Alice King, right, is one of the charming sopranos who may be heard at KDKA.



members *Musio Trades association*; 10-11, *Art Hildeman's Billmore hotel dance orchestra*, *Earl Burnett*, leader.

KMX, Hollywood, Calif. (336.9), 5:30-6:15 p. m., *Wurlitzer pipe organ*; *studio*; 6:15, *musical talk*, *W. P. Alder*; 8:30-7, *Alvaret Kest Radio music*; *Paul Jones*, director; 7-7:30, dinner hour music; 7:30, *Myer Stead, Jr.*; 8-10, *KMX feature program*; 10-12, movie night at the *Ambassador*, *Ado KPO*, *San Francisco, Calif.* (428.3), 6:15 p. m., *baseball score*; 8:40-7, *Stutes restaurant orchestra*; 7-7:30, *Buddy Selzer's Fairmont hotel orchestra*; 8-9, *sleeve club program*; *Jack Thomas*, director; 9-9:15, *golf instructions*; *Harold Sampson*; 9:15-10, *organ recital*; *Theodore J. Irwin*; 10-11, *Johnny Bock's Cabaret*.

super-dance music, *Vincent Lopez*; *Hotel Statler dance orchestra*, *Harold Glezer*, director.

WHN, New York, N. Y. (368), 7-7:30 p. m., *Harry Richman* and his *Club Richman entertainers*; 7:30-8, *E. J. Danzig's Versatile society orchestra*; 8:15-8:30, program, *Orthodox Jewish Congregation of America*; 8:30-10, *Pollacks Amusement Park orchestra*; 10:30-11, *Hotel Statler dance orchestra*.

WIP, Philadelphia, Pa. (508.2), 1 p. m., *Inchoun music from Sicily Part 3*; *song of the auro*; 7:30, *Comfort's Philharmonic orchestra*; 8:30, *Benjamin Franklin concert orchestra*; 7, *Udele Wily's bedtime stories*.

WJAH, Providence, R. I. (308.9), 7:30 p. m., program from *New York*.

WJZ, New York, N. Y. (543.3), 4:30-5 p. m., *Metro-politan string trio*; 5:30-6, *daily reports*; 7-8, *Cafe Boulevard orchestra*; 8-8:30, *the Royal trio*; 8:30-9:30, *New York Edison hour*; 10:30-11:30, *Billy Wynne's Greenwich Village Inn orchestra*; 10:30-11, *Municipal band concert*.

WKRC, Cincinnati, Ohio (326), 8 p. m., *book review*; *Alice B. Coy*; 8:15, *Lela LeMar*, pianist; 8:15, popular songs and features; 9, *Station Wicks's Bond*.

WLS, Chicago, Ill. (344.6), 6:30 p. m., *Ralph Emerson*, organist; *Martha Miller*, contralto; 7:15, *Rex's Concert*; *Hubert Ames*; 8, *Rex's Concert*; 8:15, *WLS Lensa Scout program*; 8:45, *Perry Huliker*, tenor; 10, *Frank Wilson*, tenor; *Ohio*; *Weyford*, alto; 10:45, *Brooks Colby*, violinist; 11-11:30, *Rex's Concert*.

WLW, Cincinnati, Ohio (422.3), program, *Irene Davenport* and *Maryo Hebert*; 4, *Stadl Inn program*; *Midnight*; 7, 8 p. m., dinner hour concert, *Royal Klezmer Klezmer*; *Robert Vincent*, director; 7:30, talk, *Loris male quartet*; 10:30, *Orpheus*; *John J. 11:10*, organ recital, *Johnnie Gross*; 12:15 a. m., *midnight*; *Ellie Holley's symphony Troubadours*; 12:45, *midnight strains*, *Gene Johnson*, organist.

WNAQ, Chicago, Ill. (447.5), 6 p. m., *Chicago theater hour concert*, *Midland hotel trio*; 7:15-8, *Mooseheart Philharmonic orchestra*; 8:30, lecture, *Northwestern University*; *Mrs. Helen E. Eddy*, soprano; *Oscar Heatter*, tenor; 8:15, *WMAQ players*.

WNEB, Chicago, Ill. (250), 7-8:30 p. m., *Trilane concert*; *Phyllis Horton*, soprano; *Rebecca Aquilino*, pianist; *Albert Costello*, cellist; *Charles Anna*, *Woodward band*; *baseball*; 8:30-10:30, *Trilane orchestra*; 10:30-11, *WNEB orchestra*; *Miss A. Wagon*, baritone; *Fisher and Wynne*; *Harold Steaks*; *Jack Munno*; *Trilane*; *mezzo-soprano*; *Miss A. Wagon*, baritone.

WFB, Miami Beach, Fla. (384.4), 7:30-8 p. m., *Florida Beach orchestra*; 8-10:12, *dance music*; *Pleasant Radio orchestra*.

WGL, Chicago, Ill. (447.5), 7-7:30 p. m., concert, *Ralph Vincent*; *Martha Miller*, contralto; *Phyllis Horton*, soprano; *Rebecca Aquilino*, pianist; *Albert Costello*, cellist; *Charles Anna*, *Woodward band*; *baseball*; 8:30-10:30, *Trilane orchestra*; 10:30-11, *WNEB orchestra*; *Miss A. Wagon*, baritone; *Fisher and Wynne*; *Harold Steaks*; *Jack Munno*; *Trilane*; *mezzo-soprano*; *Miss A. Wagon*, baritone.

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WGL, Chicago, Ill. (447.5), 7-7:30 p. m., concert, *Ralph Vincent*; *Martha Miller*, contralto; *Phyllis Horton*, soprano; *Rebecca Aquilino*, pianist; *Albert Costello*, cellist; *Charles Anna*, *Woodward band*; *baseball*; 8:30-10:30, *Trilane orchestra*; 10:30-11, *WNEB orchestra*; *Miss A. Wagon*, baritone; *Fisher and Wynne*; *Harold Steaks*; *Jack Munno*; *Trilane*; *mezzo-soprano*; *Miss A. Wagon*, baritone.

WGL, Chicago, Ill. (447.5), 7-7:30 p. m., concert, *Ralph Vincent*; *Martha Miller*, contralto; *Phyllis Horton*, soprano; *Rebecca Aquilino*, pianist; *Albert Costello*, cellist; *Charles Anna*, *Woodward band*; *baseball*; 8:30-10:30, *Trilane orchestra*; 10:30-11, *WNEB orchestra*; *Miss A. Wagon*, baritone; *Fisher and Wynne*; *Harold Steaks*; *Jack Munno*; *Trilane*; *mezzo-soprano*; *Miss A. Wagon*, baritone.

WGL, Chicago, Ill. (447.5), 7-7:30 p. m., concert, *Ralph Vincent*; *Martha Miller*, contralto; *Phyllis Horton*, soprano; *Rebecca Aquilino*, pianist; *Albert Costello*, cellist; *Charles Anna*, *Woodward band*; *baseball*; 8:30-10:30, *Trilane orchestra*; 10:30-11, *WNEB orchestra*; *Miss A. Wagon*, baritone; *Fisher and Wynne*; *Harold Steaks*; *Jack Munno*; *Trilane*; *mezzo-soprano*; *Miss A. Wagon*, baritone.

WGL, Chicago, Ill. (447.5), 7-7:30 p. m., concert, *Ralph Vincent*; *Martha Miller*, contralto; *Phyllis Horton*, soprano; *Rebecca Aquilino*, pianist; *Albert Costello*, cellist; *Charles Anna*, *Woodward band*; *baseball*; 8:30-10:30, *Trilane orchestra*; 10:30-11, *WNEB orchestra*; *Miss A. Wagon*, baritone; *Fisher and Wynne*; *Harold Steaks*; *Jack Munno*; *Trilane*; *mezzo-soprano*; *Miss A. Wagon*, baritone.

WGL, Chicago, Ill. (447.5), 7-7:30 p. m., concert, *Ralph Vincent*; *Martha Miller*, contralto; *Phyllis Horton*, soprano; *Rebecca Aquilino*, pianist; *Albert Costello*, cellist; *Charles Anna*, *Woodward band*; *baseball*;

An Evening at Home with the Listener In

STATIONS IN ORDER OF WAVE LENGTHS USED

Stations	Meters	Call	Meters	Call	Meters	Call	Meters	Call
226 WBBM	275.3	WJAS	315.8	KFDM	405.2	WOR	485.5	WCAP
230 WBBM	278	KWVG	315.6	WAHG	365.6	WHE	406	WBAR
233 WBBM	278	WCAU	315.6	WVGH	370	CYB	410.7	CKAC
240 WBBM	278	WLBL	319	WGR	370.2	WBBH	416.4	WCCO
243.8 WAMD	280.2	WNAE	319	WSMB	370.2	WGN	421	KIAP
250 WGES	282.8	WOAN	322.4	KOA	379.5	WGY	422.3	WLW
250 WMBR	285.5	WKAZ	325.9	WJAI	379.5	WHAZ	423.3	KPO
252 KWVE	285.5	WREO	333.3	WKB	384.4	CKY	434.5	CNRO
252 WGPC	285.5	KIIS	333.3	WNB	384.4	WBT	434.5	NAA
261 KPWA	292.9	WBEV	336.9	KNZ	389.4	WEAR	435	ATN
265.5 WMAK	293.9	WBAO	340.7	WKAQ	389.4	WTAM	440.9	KLDS
266 WBNF	296.9	KPRC	344.6	WCBW	394.5	KPRU	440.9	WDWF
272.6 WBBR	299.8	KSLI	344.6	WLS	394.5	WLIT	440.9	WOS
272.6 WBBR	299.8	WPG	348.6	KEAB	394.5	WJAI	447.5	WMAQ
273 WRW	302.8	WJJD	348.6	WVIC	394.5	WJAI	447.5	WMAQ
275 KFAU	302.8	WJAS	352.7	WJW	399.3	WHAS	454.3	KFOA
275 WJAI	305.9	KWCL	356.9	CFCA	399.3	WHIT	454.3	WJZ
275 WHAD	305.9	WJAI	356.9	CHNC	400	FWX	455	KTW
275 WHAR	309.1	KDKA	360	WHN	405.2	KJW	461.3	WVQ
275 WORD	313	CNRY	361.2	KGO	405.2	WJY	467	KFI

(FOR PACIFIC TIME)

Call	Mts.	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Met.	Call
ATP	435	Silent	3:00-4:00	Silent	Silent	Silent	Silent	Silent	435	ATP
CFCA	356.5	Silent	4:00-5:00	Silent	Silent	Silent	Silent	Silent	435	CFCA
CFCN	484.9	Silent	9:00-11:00	Silent	Silent	Silent	Silent	Silent	435	CFCN
CHNC	356.5	Silent	Silent	4:30-6:30	Silent	Silent	Silent	Silent	435	CHNC
CKAC	410.7	Silent	4:30-9:30	Silent	Silent	Silent	Silent	Silent	435	CKAC
CKY	384.4	Silent	Silent	5:00-7:45	Silent	Silent	Silent	Silent	435	CKY
CNRA	319	Silent	Silent	Silent	Silent	Silent	Silent	Silent	435	CNRA
KLD	439.2	Silent	8:30-9:30	Silent	Silent	Silent	Silent	Silent	435	KLD
CYB	370	Silent	8:15-9:45	Silent	Silent	Silent	Silent	Silent	435	CYB
CYL	400	Silent	Silent	Silent	Silent	Silent	Silent	Silent	435	CYL
CYX	300	Silent	Silent	7:15-8:30	Silent	Silent	Silent	Silent	435	CYX
KDCA	399.1	3:45-6:55	12:00-4:20	6:45-6:55	5:45-6:30	5:45-6:55	5:00-8:30	5:45-6:55	399.1	KDCA
KFAD	240	9:00-10:30	2:00-3:00	5:00-6:30	Silent	Silent	Silent	Silent	240	KFAD
KFAE	348.6	Silent	Silent	Silent	Silent	Silent	Silent	Silent	348.6	KFAE
KFAU	275	Silent	Silent	7:00-8:00	Silent	Silent	Silent	Silent	275	KFAU
KFD	315.6	Silent	6:00-7:00	Silent	Silent	Silent	Silent	Silent	315.6	KFD
KFI	467	6:45-12:00	4:00-11:00	6:45-11:00	6:00-8:30	Silent	6:45-11:00	6:45-11:00	467	KFI
KFN	286	Silent	Silent	Silent	7:00-8:30	Silent	Silent	Silent	286	KFN
KFOA	454.3	6:00-11:30	Silent	6:00-10:00	6:00-11:30	Silent	5:30-6:30	5:30-6:30	454.3	KFOA
KFRU	394.5	5:30-10:00	3:00-5:00	5:00-8:30	3:00-10:00	Silent	8:30-9:30	8:30-9:30	394.5	KFRU
KGE	460.5	Silent	Silent	6:15-7:15	8:00-10:00	Silent	6:15-8:15	Silent	460.5	KGE
KH	300	Silent	Silent	8:00-10:00	Silent	Silent	Silent	Silent	300	KH
KIAP	421	Silent	7:00-10:00	8:00-10:00	7:00-11:00	Silent	7:00-11:00	7:00-11:00	421	KIAP
KJW	381.2	1:00-1:30	3:30-9:00	8:00-1:00	Silent	Silent	8:00-1:00	8:00-1:00	381.2	KJW
KJY	405.2	5:30-11:30	6:00-11:00	7:00-1:00	8:00-1:00	Silent	8:00-12:00	9:00-12:00	405.2	KJY
KK	300	Silent	Silent	Silent	Silent	Silent	Silent	Silent	300	KK
KKX	326.9	4:00-9:00	5:00-11:00	6:30-12:00	6:30-12:00	Silent	6:00-10:00	5:00-10:00	326.9	KKX
KOA	322.4	8:00-11:00	3:30-7:30	7:00-8:00	Silent	Silent	7:00-11:00	Silent	322.4	KOA
KPRC	266	6:25-12:00	6:30-10:00	6:30-11:00	6:30-11:00	Silent	6:30-11:00	7:00-11:00	266	KPRC
KSD	545.1	8:00-9:00	7:30-8:00	7:00-9:00	6:30-7:30	Silent	6:30-7:30	6:30-7:30	545.1	KSD
KSL	299.8	7:00-10:00	8:00-10:00	7:00-10:00	8:00-10:00	Silent	7:00-10:00	8:00-10:00	299.8	KSL
KTHS	305.9	6:30-8:00	6:30-8:00	6:30-8:00	6:30-8:00	Silent	6:30-8:00	6:30-8:00	305.9	KTHS
KTW	455	Silent	7:00-9:30	Silent	Silent	Silent	Silent	Silent	455	KTW
KWVG	278	6:30-7:30	Silent	Silent	7:30-8:30	Silent	Silent	Silent	278	KWVG
KWY	356.5	4:00-10:30	1:00-6:00	Silent	4:00-8:30	Silent	4:00-8:30	4:00-8:30	356.5	KWY
NAA	434.9	Silent	Silent	4:45-5:00	4:45-5:00	Silent	4:45-5:00	4:45-5:00	434.9	NAA
PWX	500	Silent	Silent	Silent	Silent	Silent	Silent	Silent	500	PWX
WAB	275	5:30-8:00	Silent	Silent	Silent	Silent	Silent	Silent	275	WAB
WAHG	315.6	8:00-11:00	Silent	4:00-10:00	Silent	Silent	Silent	Silent	315.6	WAHG
WAMD	280.2	3:00-9:00	12:00-3:00	Silent	8:00-9:00	Silent	8:00-9:00	8:00-9:00	280.2	WAMD
WBA	406	5:00-9:00	9:00-10:00	5:30-10:00	5:30-8:45	Silent	5:30-8:45	5:30-8:45	406	WBA
WBAV	295.9	Silent	Silent	5:00-7:00	Silent	Silent	Silent	Silent	295.9	WBAV
WBBM	226	5:00-9:00	1:00-7:00	Silent	5:00-9:00	Silent	5:00-9:00	5:00-9:00	226	WBBM
WBBR	272.6	4:00-5:00	4:00-5:30	4:00-5:30	Silent	Silent	4:00-5:00	4:00-5:00	272.6	WBBR
WBCN	250	6:00-10:00	2:00-9:00	Silent	6:00-12:00	Silent	5:00-9:00	6:00-10:00	250	WBCN
WBCZ	250	6:00-10:00	2:00-9:00	Silent	6:00-12:00	Silent	5:00-9:00	6:00-10:00	250	WBCZ
WCAE	461.3	4:00-5:30	12:00-4:30	4:00-8:00	4:00-7:00	Silent	4:00-5:30	4:00-5:30	461.3	WCAE
WCAP	485.5	Silent	1:00-6:15	Silent	4:20-7:00	Silent	3:45-7:00	4:20-7:00	485.5	WCAP
WCCO	370.2	Silent	1:00-4:00	Silent	2:30-8:00	Silent	2:30-7:45	2:30-7:45	370.2	WCCO
WCD	344.6	Silent	6:00-7:00	5:00-7:30	Silent	Silent	5:00-7:30	Silent	344.6	WCD
WCF	516.9	4:05-9:00	5:30-8:15	4:00-7:00	4:00-7:00	4:00-7:00	4:00-7:00	4:00-7:00	516.9	WCF
WCG	322.4	8:00-11:00	4:15-5:30	4:00-7:00	4:00-7:00	4:00-7:00	4:00-7:00	4:00-7:00	322.4	WCG
WDAF	365.6	4:00-11:00	2:00-3:00	4:00-11:00	4:00-11:00	Silent	4:00-11:00	4:00-11:00	365.6	WDAF
WDFW	440.9	Silent	1:00-2:45	Silent	4:00-5:00	Silent	Silent	Silent	440.9	WDFW
WDO	322.4	2:00-8:00	8:30-8:15	2:00-7:30	3:00-8:00	Silent	2:00-8:00	2:00-8:00	322.4	WDO
WEAR	394.5	4:00-5:00	12:30-7:00	4:00-5:00	4:00-8:00	Silent	4:00-8:00	4:00-8:00	394.5	WEAR
WEBC	380.2	4:00-9:30	4:00-8:00	Silent	4:00-9:30	Silent	4:00-9:30	4:00-9:30	380.2	WEBC
WEED	253	Silent	Silent	3:20-6:30	4:00-7:00	4:00-7:00	4:00-7:00	4:00-7:00	253	WEED
WEEI	421	Silent	3:20-6:30	4:00-7:00	4:00-7:00	4:00-7:00	4:00-7:00	4:00-7:00	421	WEEI
WFBH	272.6	7:30-10:00	1:00-4:00	4:30-7:30	7:30-10:00	Silent	4:30-10:00	4:30-10:00	272.6	WFBH
WFI	394.5	2:00-3:45	12:30-4:30	Silent	4:00-6:00	Silent	2:45-3:45	2:45-3:45	394.5	WFI
WGBS	315.6	Silent	3:30-8:00	3:30-8:00	Silent	Silent	3:30-8:00	3:30-8:00	315.6	WGBS
WGBS	315.6	Silent	3:30-8:00	3:30-8:00	Silent	Silent	3:30-8:00	3:30-8:00	315.6	WGBS
WGN	370.2	3:30-8:00	6:00-7:00	Silent	3:30-8:00	Silent	3:30-8:00	3:30-8:00	370.2	WGN
WGR	319	Silent	2:45-3:45	3:00-8:00	3:00-8:00	Silent	3:00-8:00	3:00-8:00	319	WGR
WGY	370.2	6:00-9:00	3:30-8:00	3:30-8:00	4:10-8:00	Silent	3:45-8:30	4:10-8:00	370.2	WGY
WHAD	275	4:00-5:00	Silent	4:00-8:00	4:00-5:00	4:00-10:30	4:00-5:00	4:00-5:00	275	WHAD
WHAS	399.3	3:30-6:00	6:00-8:00	3:30-6:00	3:30-6:00	Silent	3:30-6:00	3:30-6:00	399.3	WHAS
WHAS	399.3	Silent	Silent	6:00-8:00	Silent	Silent	Silent	Silent	399.3	WHAS
WHAZ	379.5	Silent	Silent	6:00-11:00	5:00-6:00	Silent	6:00-8:00	5:00-6:00	379.5	WHAZ
WHB	356.5	Silent	3:00-8:00	3:00-8:00	3:00-8:00	Silent	3:00-8:00	3:00-8:00	356.5	WHB
WHO	290	3:30-6:00	3:30-8:00	3:30-8:00	3:30-8:00	Silent	3:30-8:00	3:30-8:00	290	WHO
WHY	394.5	4:00-10:00	9:00-7:00	4:00-10:00	4:00-10:00	4:00-10:00	4:00-10:00	4:00-10:00	394.5	WHY
WHZ	299.8	3:00-5:00	3:00-8:00	3:00-8:00	3:00-12:00	Silent	3:00-12:00	3:00-12:00	299.8	WHZ
WIBO	226	4:00-8:00	Silent	4:00-8:00	4:00-8:00	Silent	4:00-8:00	4:00-8:00	226	WIBO
WIJ	305.9	Silent	3:20-6:15	Silent	4:00-6:00	Silent	4:00-6:00	4:00-6:00	305.9	WIJ
WIJA	305.9	Silent	3:20-6:15	Silent	4:00-6:00	Silent	4:00-6:00	4:00-6:00	305.9	WIJA
WIAS	272.6	Silent	Silent	5:30-8:00	5:30-8:00	Silent	5:30-8:00	5:30-8:00	272.6	WIAS
WIJD	322.4	3:45-10:00	5:45-7:30	3:45-10:00	3:45-10:00	Silent	3:45-7:00	3:45-7:00	322.4	WIJD
WIK	322.4	3:45-10:00	5:45-7:30	3:45-10:00	3:45-10:00	Silent	3:45-7:00	3:45-7:00	322.4	WIK
WIL	344.6	3:00-7:30	4:00-7:00	3:00-7:30	4:15-5:15	Silent	4:30-7:30	4:30-7:30	344.6	WIL
WKAQ	406	Silent	4:00-6:00	Silent	Silent	Silent	4:00-6:00	Silent	406	WKAQ
WKAR	253.3	3:00-11:00	3:45-8:00	Silent	7:00-9:00	Silent	5:00-6:15	Silent	253.3	WKAR
WKBC	422.3	7:00-9:00	Silent	Silent	7:00-9:00	Silent	6:00-7:00	Silent	422.3	WKBC
WLB	278	9:30-10:00	Silent	Silent	Silent	Silent	Silent	Silent	278	WLB
WLIT	394.5	3:00-4:30	Silent	3:30-7:00	Silent	Silent	6:00-7:00	Silent	394.5	WLIT
WLS	344.6	4:45-10:00	4:00-5:05	Silent	4:00-10:00	Silent	4:00-8:30	4:00-5:55	344.6	WLS
WLW	422.3	3:00-5:00	6:30-7:30	4:00-7:00	4:00-7:00	Silent	4:00-1:15	Silent	422.3	WLW
WMAK	265.5	Silent	Silent	5:30-7:15	Silent	Silent	Silent	Silent	265.5	WMAK
WMAQ	440.9	5:00-7:00	Silent	Silent	5:00-7:15	Silent	5:00-7:15	5:00-7:15	440.9	WMAQ
WMB	348.6	3:00-9:00	3:30-8:00	3:30-8:00	3:30-8:00	Silent	3:30-8:00	3:30-8:00	348.6	WMB
WMC	497.7	3:00-7:30	Silent	5:30-7:30						

An Evening at Home with the Listener In

(FOR CENTRAL TIME)

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(FOR EASTERN TIME Or Cities Using Central
Daylight Saving Time)

Call	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Call	Location	Met.	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Call	
AT9	Silent	5:00-6:00	Silent	Silent	Silent	7:00-8:55	Silent	AT9	Fort Bragg, N. C.	435	Silent	6:00-7:00	Silent	Silent	Silent	Silent	Silent	AT9	
CFCA	Silent	6:00-7:00	Silent	7:15-8:15	7:15-8:15	7:15-8:15	Silent	CFCA	Toronto, Ont.	356.9	Silent	7:00-8:00	Silent	8:15-9:15	8:15-9:15	8:15-9:15	Silent	CFCA	
CFCN	11:00-1:00	Silent	Silent	Silent	Silent	Silent	Silent	CFCN	Category, Ala.	492.8	12:00-2:00	Silent	Silent	Silent	Silent	Silent	Silent	CFCN	
CHNC	Silent	Silent	6:30-7:30	Silent	Silent	Silent	Silent	CHNC	Toronto, Ont.	356.9	Silent	7:30-8:30	Silent	Silent	Silent	Silent	Silent	CHNC	
CJAC	10:00-12:00	8:30-9:30	8:30-10:00	8:30-9:00	7:00-9:00	10:00-12:00	9:30-12:00	CJAC	Montreal, Que.	516.9	11:00-1:00	9:30-10:30	9:30-11:30	9:30-10:30	8:00-10:00	11:00-1:00	10:30-1:00	CJAC	
CKCQ	5:30-9:30	Silent	Silent	6:30-9:30	6:30-9:30	6:30-9:30	6:30-9:30	CKCQ	Edmonton, Can.	410.7	8:00-10:00	Silent	Silent	6:30-10:30	Silent	6:30-10:30	7:30-8:30	CKCQ	
CKY	Silent	7:00-9:45	Silent	8:30-10:45	8:30-10:45	8:30-9:00	8:30-9:45	CKY	Wilmington, Wash.	384.4	Silent	8:00-10:45	Silent	Silent	9:30-11:45	Silent	9:30-10:45	CKY	
CNRA	Silent	Silent	Silent	6:30-7:30	Silent	Silent	6:30-7:30	CNRA	Moncton, Can.	513	Silent	Silent	Silent	Silent	Silent	Silent	Silent	CNRA	
CNRO	6:30-11:30	Silent	Silent	Silent	6:30-11:30	Silent	Silent	CNRO	Ottawa, Ont.	434.5	7:30-12:30	Silent	Silent	Silent	7:30-12:30	Silent	7:30-12:30	CNRO	
CYB	10:30-11:45	Silent	Silent	0:15-10:15	Silent	Silent	Silent	CYB	Mexico City, Mex.	370	11:30-12:15	Silent	Silent	10:15-11:15	Silent	Silent	Silent	Silent	CYB
CVL	Silent	Silent	Silent	9:15-10:30	Silent	10:00-11:30	Silent	CVL	Mexico City, Mex.	480	Silent	Silent	Silent	11:00-12:30	Silent	Silent	Silent	Silent	CVL
KOKA	7:45-8:55	2:00-6:00	7:45-8:55	7:45-10:30	7:45-8:55	7:00-10:30	7:45-8:55	KOKA	Pittsburgh, Pa.	399.1	8:45-9:55	3:00-7:30	8:45-9:55	8:45-9:55	8:45-9:55	8:00-11:30	8:45-9:55	KOKA	
KFAB	11:00-12:30	4:00-6:00	Silent	7:30-10:00	Silent	7:30-10:00	Silent	KFAB	Lincoln, Neb.	240	12:00-1:30	6:00-6:00	8:30-11:00	Silent	8:30-11:00	Silent	8:30-11:00	KFAB	
KFAE	Silent	Silent	Silent	Silent	9:30-11:00	Silent	Silent	KFAE	Pullman, Wash.	348.0	Silent	Silent	Silent	Silent	10:30-12:00	Silent	Silent	KFAE	
KFRB	Silent	Silent	Silent	Silent	Silent	Silent	Silent	KFRB	La Jolla, Ind.	275	Silent	Silent	10:00-11:00	Silent	Silent	Silent	Silent	KFRB	
KFDN	Silent	8:00-9:00	Silent	8:00-10:30	Silent	Silent	Silent	KFDN	Beaumont, Texas	315.9	9:00-10:00	6:00-12:00	Silent	Silent	Silent	Silent	Silent	KFDN	
KFI	8:45-2:00	6:00-1:00	8:45-1:00	8:45-1:00	8:45-1:00	8:45-1:00	8:45-1:00	KFI	Los Angeles, Calif.	467	9:45-3:00	7:00-2:00	9:45-2:00	9:45-2:00	9:45-2:00	9:45-2:00	9:45-2:00	KFI	
KFMQ	Silent	Silent	Silent	9:00-10:00	Silent	Silent	Silent	KFMQ	Fayetteville, Ark.	299.8	Silent	Silent	Silent	10:00-11:00	Silent	Silent	Silent	KFMQ	
KFNH	7:30-8:30	6:30-10:00	7:30-8:30	7:30-8:30	7:30-8:30	7:30-8:30	7:30-8:30	KFNH	Shenandoah, Ia.	266	8:30-9:30	7:30-11:00	8:30-9:30	8:30-9:30	8:30-9:30	8:30-9:30	8:30-9:30	KFNH	
KFRU	7:00-12:00	5:00-7:00	7:00-12:00	8:00-1:30	8:00-1:30	8:00-1:30	8:00-1:30	KFRU	Seattle, Wash.	454.3	8:00-9:30	8:00-9:30	8:00-9:30	8:00-9:30	8:00-9:30	8:00-9:30	8:00-9:30	KFRU	
KFUO	Silent	8:15-9:15	8:00-9:00	Silent	Silent	Silent	Silent	KFUO	St. Louis, Mo.	545.1	Silent	6:00-8:00	8:00-11:30	11:30-1:00	11:30-1:00	11:30-1:00	11:30-1:00	KFUO	
KFWA	10:00-12:00	Silent	10:00-12:00	10:00-12:00	10:00-12:00	10:00-12:00	10:00-12:00	KFWA	University City, Mo.	240	11:00-1:00	Silent	11:00-1:00	11:00-1:00	11:00-1:00	11:00-1:00	11:00-1:00	KFWA	
KFWB	Silent	11:00-1:00	10:00-12:00	10:00-12:00	10:00-12:00	10:00-12:00	10:00-12:00	KFWB	Ogden, Utah	281	Silent	10:00-1:00	11:00-1:00	11:00-1:00	11:00-1:00	11:00-1:00	11:00-1:00	KFWB	
KGO	9:00-1:00	5:30-11:00	9:00-1:00	9:00-1:00	9:00-1:00	9:00-1:00	9:00-1:00	KGO	Plywood, Calif.	220	11:00-12:00	12:00-2:00	9:30-2:00	10:15-2:00	10:15-2:00	10:15-2:00	10:15-2:00	KGO	
KHW	8:00-2:00	9:00-12:00	8:00-2:00	11:00-2:00	11:00-2:00	11:00-2:00	11:00-2:00	KHW	Portland, Ore.	481.5	9:00-3:00	10:30-1:00	9:00-10:00	12:00-3:00	11:00-2:00	11:00-2:00	11:00-2:00	KHW	
KJW	7:30-1:00	8:00-1:00	8:00-3:30	7:30-1:00	7:30-1:00	7:30-1:00	7:30-1:00	KJW	Los Angeles, Calif.	405.2	8:30-2:00	10:00-2:00	10:00-2:00	8:30-2:00	8:30-2:00	8:30-2:00	8:30-2:00	KJW	
KIAT	Silent	4:00-5:00	0:00-10:00	Silent	9:00-10:00	Silent	9:00-10:00	KIAT	Sihlkap, Minn.	421	Silent	3:00-4:00	8:00-9:00	Silent	Silent	8:00-9:00	Silent	KIAT	
KIAR	Silent	8:00-9:00	0:00-10:00	Silent	9:00-10:00	Silent	9:00-10:00	KIAR	Seattle, Wash.	484.4	Silent	10:00-11:00	9:00-1:00	Silent	11:30-1:00	1:30-3:00	11:30-1:00	KIAR	
KLDS	Silent	9:15-11:30	0:00-10:00	Silent	10:00-11:00	Silent	10:00-11:00	KLDS	Los Angeles, Calif.	394.5	Silent	9:15-10:15	8:00-10:00	Silent	Silent	11:00-12:00	Silent	KLDS	
KLX	Silent	6:30-10:00	Silent	8:00-9:00	Silent	8:00-9:00	Silent	KLX	Independence, Mo.	440.9	Silent	7:00-11:00	Silent	9:00-10:00	Silent	9:00-10:00	Silent	KLX	
KMX	10:00-4:00	7:00-1:00	8:30-2:00	8:30-2:00	8:30-2:00	8:30-2:00	8:30-2:00	KMX	Oakland, Calif.	508.2	Silent	9:00-2:00	Silent	9:00-2:00	Silent	9:00-2:00	Silent	KMX	
KNP	10:00-2:00	8:00-1:00	8:30-2:00	8:30-2:00	8:30-2:00	8:30-2:00	8:30-2:00	KNP	Hollywood, Calif.	393.9	11:00-5:00	8:00-2:00	9:30-3:00	9:30-3:00	9:30-3:00	9:30-3:00	9:30-3:00	KNP	
KPD	8:25-2:00	8:30-12:00	8:30-1:00	8:30-1:00	8:30-1:00	8:30-1:00	8:30-1:00	KPD	San Francisco, Calif.	428.3	9:25-3:00	6:30-10:30	10:00-11:00	Silent	10:00-1:00	9:00-2:00	9:00-2:00	9:00-2:00	KPD
KPRC	8:30-9:30	8:00-9:00	8:00-9:00	8:30-9:30	8:30-9:30	8:30-9:30	8:30-9:30	KPRC	Houston, Texas	296.9	9:30-10:30	9:00-10:00	9:30-10:30	9:30-10:30	9:30-10:30	9:30-10:30	9:30-10:30	KPRC	
KSD	7:00-9:30	Silent	8:00-11:00	8:00-11:00	8:00-11:00	8:00-11:00	8:00-11:00	KSD	St. Louis, Mo.	545.1	10:00-10:50	Silent	10:00-12:00	7:30-9:30	7:30-9:30	7:30-9:30	7:30-9:30	KSD	
KSL	9:00-12:00	10:00-12:00	10:00-12:00	10:00-12:00	10:00-12:00	10:00-12:00	10:00-12:00	KSL	Salt Lake City, Utah	293.2	Silent	11:00-1:00	10:00-1:00	11:00-1:00	10:00-1:00	10:00-1:00	10:00-1:00	KSL	
KTCL	Silent	9:50-11:15	10:00-12:00	10:00-12:00	10:00-12:00	10:00-12:00	10:00-12:00	KTCL	Hot Springs, Ark.	305.9	Silent	11:00-1:00	10:00-1:00	11:00-1:00	10:00-1:00	10:00-1:00	10:00-1:00	KTCL	
KTHS	8:30-10:00	8:30-10:00	8:30-10:00	8:30-10:00	8:30-10:00	8:30-10:00	8:30-10:00	KTHS	Brownsville, Texas	374.8	9:30-11:00	9:30-11:00	9:30-11:00	9:30-11:00	9:30-11:00	9:30-11:00	9:30-11:00	KTHS	
KWVG	8:30-9:30	Silent	Silent	8:30-9:30	Silent	8:30-9:30	Silent	KWVG	Brownsville, Texas	278	9:30-10:30	Silent	Silent	9:30-10:30	Silent	9:30-10:30	Silent	KWVG	
KTW	9:00-11:30	9:00-11:30	Silent	Silent	Silent	Silent	Silent	KTW	Seattle, Wash.	455	Silent	10:00-12:00	Silent	Silent	Silent	Silent	Silent	KTW	
KYK	8:00-12:00	3:00-7:00	Silent	9:00-10:00	6:00-12:00	6:00-12:00	6:00-12:00	KYK	Chicago, Ill.	555.4	7:00-1:00	4:00-8:00	Silent	7:00-11:30	7:00-11:30	7:00-11:30	7:00-11:30	KYK	
KYX	Silent	6:45-7:00	Silent	6:45-7:00	Silent	6:45-7:00	Silent	KYX	Chicago, Ill.	490	8:00-11:00	Silent	Silent	7:45-8:00	7:45-8:00	7:45-8:00	7:45-8:00	KYX	
PWW	7:30-10:00	Silent	Silent	Silent	7:30-10:00	Silent	Silent	PWW	Havana, Cuba	400	8:00-11:00	Silent	Silent	Silent	Silent	Silent	Silent	PWW	
WAB	Silent	Silent	Silent	Silent	Silent	Silent	Silent	WAB	St. Louis, Mo.	275	Silent	7:00-9:00	Silent	7:00-9:00	Silent	7:00-9:00	Silent	WAB	
WAH	11:00-1:00	Silent	6:00-12:00	Silent	5:30-10:00	Silent	6:00-9:30	WAH	Richmond, N. Y.	315.8	12:00-2:00	Silent	7:00-1:00	Silent	6:00-11:00	6:00-11:00	6:00-11:00	6:00-11:00	WAH
WAM	10:00-11:00	Silent	10:00-11:00	10:00-11:00	10:00-11:00	10:00-11:00	10:00-11:00	WAM	Manassas, Va.	250	11:00-12:00	12:00-11:00	Silent	11:00-12:00	11:00-12:00	11:00-12:00	11:00-12:00	WAM	
WBP	7:00-8:00	11:00-12:00	7:30-12:00	7:30-10:45	7:30-10:45	7:30-10:45	7:30-10:45	WBP	Fort Worth, Texas	475.9	8:00-9:00	12:00-11:00	Silent	11:00-12:00	11:00-12:00	11:00-12:00	11:00-12:00	WBP	
WBR	Silent	10:00-11:00	7:00-12:00	Silent	8:00-9:00	7:30-8:30	7:30-8:30	WBR	Sioux Falls, S. D.	408	Silent	11:00-12:00	10:00-11:00	10:00-11:00	10:00-11:00	10:00-11:00	10:00-11:00	WBR	
WBY	Silent	Silent	Silent	Silent	Silent	Silent	Silent	WBY	Columbus, O.	293.9	Silent	8:00-10:00	Silent	8:00-10:00	Silent	8:00-10:00	Silent	WBY	
WBBM	7:00-11:00	3:00-9:00	7:00-11:00	7:00-9:00	7:00-9:00	7:00-9:00	7:00-9:00	WBBM	Chicago, Ill.	228	8:00-12:00	4:00-10:00	Silent	8:00-12:00	8:00-10:00	8:00-12:00	8:00-10:00	WBBM	
WBCN	6:00-7:00	4:00-11:00	6:00-7:00	6:00-7:00	6:00-7:00	6:00-7:00	6:00-7:00	WBCN	Chicago, Ill.	273.3	7:00-8:00	8:00-9:30	7:00-8:00	Silent	7:00-8:00	7:00-8:00	7:00-8:00	WBCN	
WBZ	3:00-12:00	4:00-11:00	3:00-12:00	3:00-12:00	3:00-12:00	3:00-12:00	3:00-12:00	WBZ	Chicago, Ill.	248	8:00-12:00	8:00-9:30	8:00-12:00	Silent	8:00-12:00	8:00-9:30	8:00-12:00	WBZ	
WBT	5:30-7:55	6:00-7:50	6:00-7:55	6:00-7:55	6:00-7:55	6:													

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Now to Scold Stations

WHEN the great artist, the vaudeville star, the actor has finished his or her performance and applause is given, it remains a tradition of the stage that a bow at least shall be given to the audience. Not to do so would be a violation of common courtesy. Yet broadcasting stations, the MAJORITY OF THEM, are very lax in the way they make their bows. The applause, of course, is a little different. The invisible audience uses the mail or telegraph. In reply it expects the courtesy of a reply. It expects this reply within ten days after the applause has been sent. The public is not exacting too much. It does not expect a personal letter. All that is wanted is some form of acknowledgment card or letter.

Going further, some of the members of the audience are collecting station reception verification stamps. When these members send excerpt notes of a station's program for verification, and ten cents for the stamp, there is all the more reason for that station's showing haste to either return the ten cents, if stamps are not supplied, or send the verification stamp at once. Not a week should elapse.

But do the stations handle their correspondence in accordance with common courtesy? No, absolutely, not. Instead, the applause mail and telegrams are often filed or even thrown away without a thought of a postal card acknowledgment.

What happens? The station, which undoubtedly expects to carry good will for the purpose of indirect advertisement, loses ardent supporters and listeners by the score. The people feel that if correspondence is handled so, how must the newspapers, Radio apparatus, or other manufactured products sold by the broadcasting company be handled? If a hotel, how are the guests treated? In the same way as the applause correspondence?

It pays to be courteous at all times in all branches of business.

We are in receipt of a detailed letter from a listener who has made a research on how poorly applause mail is treated by the broadcasters. This man took pains to list and time each station to which he sent mail. He was collecting station stamps. He sent dimes with each letter.

Six stations out of twenty-eight addressed were written FIVE times before the courtesy of a reply was extended.

This is outrageous. Stations who are unable to handle their applause decently, that is to at least send a form acknowledgment postcard reply, should refrain from broadcasting. They do not deserve to have applause.

Upon Meeting a Station Director

HE WAS a most pleasant fellow to meet, this director-announcer. He had never seen the editors or offices of Radio Digest, and, while visiting the city, made a call to get acquainted. We, as representatives of the listening public, were agreeably surprised at his youth, strong personality and good judgment.

After we had taken him about the city and shown him the various studios, we spent an enjoyable evening with him discussing broadcasting. His observations were not what one would expect from a young man. They were keen and showed careful analysis.

He was amazed at the number of different ways in which the city's stations were conducted.

"To the listener, the broadcasters probably appear to be very much the same," he said, "but to me the procedures are unique in almost every case. But that is what is improving the art. Studio practice is being perfected by such innovations, and some day, when perfection is reached, if it is ever, will be time enough for standardization of methods."

At the present time it is a matter for the individual announcer to figure out the procedure that fits his individual case. Fans in one part of the country like one thing while in another part something else is wanted.

We like to get acquainted with the directors and other members of the station personnel. It gives one an insight on conditions from a different set of eyes than one is liable to acquire by sitting in the editor's chair.

RADIO INDI-GEST

Why They Took the Electric Wires Down

A RADIO station has been installed in Linton that deserves special mention by reason of the fact that it is more or less a county affair and evidences the courteous treatment that is accorded our guests at the county boarding house. From the flag pole on the belfry tower over our jail or blind-pig correction house, floats a Radio aerial and below in the lounging room in front of the cells is an up-to-date Radio receiving machine for the use of the inmates. We think that Linton can boast of having the most modern correction house in the state. Shortly after the three gentlemen who were so unlucky as to get caught with booze in their possession were compelled to accept the invitation of Judge McKenna to be jail guests of this county, the leading mechanic of the trio brought down his Radio from his home and installed it in jail and now they pass the evening hours away listening to lectures and concerts far away until it is time to go to bed or home for the night. On Sundays as a matter of convenience they will have their Sunday sermon by the Rev. Spurgeon from Sprugetown brought to them over the Radio. It has been suggested to us that this Radio station should be given the name of Jail-De Luxe, and call by the initials J-L-D Luxe. Reports say that the inmates are very much perturbed over the fact that the electric wires in that vicinity interfere with the action of their Radio, and it is possible that the electric wires will have to be removed that our guests may not be inconvenienced. Reclining chairs will be installed next week. (News clip from Doc. W.E.W.)

Our jail ain't the same as when I was a boy;
They've even removed all the moss,
And taken the roof from off of the top
To cut down the dielectric loss.

When They Moved

When they were planning to make a move
From one town to another,
They wanted one thing specially—
A den for the Radio brother.
So they searched the places all around
For a house that was just a fit
For the family, and would still have room
For all of the Radio kit.

They wanted a place on a quiet street
Far away from the noisy crowd
With lots and lots of open space
Where they could think out loud.

Well, at last they found an eight room house
With neighbors they liked right well,
And they thought at last they were in heav'n,
But—it is sad to tell.

The numerous wires were all strung up
And everything else in place
Then the brother took a look around
And you should have seen his face!

A Heterodyne right next to them
A super behind, in a flat,
And a ten tube set at the corner,
Now what do you think of that!

They now got what they have time to get
Before the others begin,
The house soon will be "To Let," again,
With the Radio set thrown in!

L. G.

LONDON BOBBY writes to tell us that he overheard two men talking about how to get to a certain house. "Well," says the one, "How'll I find it when I get on that street?" "You can't help it," replied the other, "it's the only house in that block that hasn't got an aerial on it."

Now, that's a real distinction!

Lit-tle Rol-lo at the Ra-di-o Store In Words of One Syllable

What does the pic-ture show? It shows lit-tle Rol-lo in a Ra-di-o store. He is buy-ing a Ra-di-o. The sales-man is say-ing, "for vol-ume, dis-tance and se-lec-tiv-i-ty you can't beat this out-fit. Ten dol-lars down and ya can drag it home."

"Be-fore we en-ter pec-u-ni-a-ry dis-cus-sions," re-plied lit-tle Rol-lo, "let us ex-a-mine the tech-ni-cal fea-tures. Is the cir-cuit a-per-i-o-d-i-cally bal-anced on the ne-ga-tive po-ten-ti-o-me-ter?"
"Oh, yah. Just one knob, push the but-ton, a twist of the wrist and in comes the beau-ti-ful mu-sic. Shall I wrap it up?"

"And what of the be-no-ma-tic pie-tur-i-zation of os-cil-lat-ing in-duc-tion?" con-tin-ued lit-tle Rol-lo.

"Use pea-nut tubes and get coast to coast," re-plied the sales-man. "You can't lose. She's a world beat-er. It's the last one in stock. Shall I wrap it up?"
"Is su-per-he-ter-o-dyn-ing ob-vi-a-ated by con-den-sers?"

"Rol-lo," cried a voice. It was mother. "You have been read-ing a-gain. And as for you, sir, we do not want a Ra-di-o in the home as it would keep Rol-lo from his bus-ness les-sons. Come, Rol-lo, we will see if fa-ther is back from work at the cus-pi-dor fac-tory."

THE THIRD TROMBONE PLAYER.

What with youthful wizards in chess, mathematics, music, astronomy and everything else we are rather surprised none has appeared in Radio as yet.

Funny Joke

While 2LO in London was broadcasting a program someone in the studio dropped a penny. A Scotchman in Aberdeen picked it up on the Radio.

Nothing locks so well at the bottom of a column as a funny joke.

The Swap



Condensed

BY DIELECTRIC

I seldom step beyond the borders of the United States to find material for comment in these columns, yet many of you readers are tuned nightly to Canadian and other outside stations. There is a lesson to draw from the manner of announcing at Station CFCE, Montreal, Canada, applicable to some of our rebroadcasting stations, but not all. While Smith's orchestra played dance numbers the announcer wasted not a second between selections in giving his station call, nor did he omit the call. That is where so many of our best stations make a serious error.

At least for this season, we may expect no more college glee club concerts, a form of entertainment that has a pretty general appeal, so long as the rah-rah stuff is kept in the background. Most of the clubs are trained by men of considerable musical talent and present uniformly good work, as for instance that of Yale university which rendered songs and banjo numbers in a concert in New Haven, Conn., and broadcast through Station WJZ. It was very pleasing entertainment.

Station WCCO, the Gold Medal station at St. Paul-Minneapolis, has a fairly wide reception radius with audiences mostly in favor of their programs. The Gold Medal trio is establishing a name for itself among broadcast features purely on its merit and successfully chooses numbers most likely to meet the varied tastes of the Radio public. Perhaps the Silver Lake band is not deserving of extraordinary praise, yet it is the equal of many good bands being heard from broadcasting studios.

While mention is made from time to time of those stations indulging in useless time-consuming performances, such as reading telegrams, etc., it is only fair to point to other stations whose evident purpose is to meet the wishes of listeners in. So I call attention to WRC, Washington, where the announcer interrupts only so long as is required to give the call letters between orchestra numbers. Listening to the Paradise band from that station was enjoyable for that reason.

I believe "Stars and Stripes Forever" has seldom been played with the snap put into it by a band appearing in the studio of WTAS, Elgin, not long ago. In fact, every number was rendered in a manner to indicate enthusiasm of all the players. The announcer was kept rather busy announcing various quantities of cartons of cigarettes, which were either presented to, or by, a large male audience ranging in age from one year upward. What was the brand name? N. B. tobacco interests.

One of the best talk features heard during these warm evenings was that of a reporter discussing bootlegging in somewhat of a humorous vein from Station KYW. Songs were heard during the same evening, some of them good and others—songs, that's all. And yet, there is more of paradise in ANY song than in Monday night advertising from Chicago's suburban agencies. Silence, or no ads; there's a motto!

Those of us who were tuned to WGY, Schenectady, during the broadcasting of a Scotch program were well paid for twisting the dials. There is a station with uniformly excellent transmission, even though certain sections suffer fading from this station, and much care and thought is given to every feature before it is put on the air.

Recent Advances in Tuned R.F. Amplification

Part VII—Shielding and Compensating Condensers

By Milo Gurney

THE letter response to the series of articles upon Wheatstone bridge circuits, which were to have been concluded with my last installment, has been so large I now regret that I did not bring up for discussion additional features pertinent to the subject. These would border, in part, upon structural details, particularly as they apply to shielding and the type and location of capacitive balances used.

No doubt the reader has realized that in circuits of this character every tendency toward interstage coupling whether of the inductive or capacitive order, should be under control. Note, in particular, that I use the term "under control" as against zero relationship in interstage influence, and I so employ the term in order that one may not attempt the impossible. Obviously, progressive result is desired up to the point of allowing a coupled regenerative booster just below the point of oscillation. Uncontrolled progression would, in all essentials, be as disastrous as total elimination of capacitive coupling. As such portions of the circuit as inductances, wiring, etc., are uncontrolled factors, while the variable capacities are controllable, it is then apparent that individual stage shielding is all important. Each stage, in effect, is an individual isolated receiving unit with no repeater action, other than forward, being possible.

Good as Super-Het for 2X
The capacitive factors being variable, in a large measure, furnish us the total control desired. There can be no question but that a well constructed bridge circuit is superior in all around performance to the popular super-heterodyne, although I am quite ready to admit that, not unlike the super, experience will cost most toward success. One cannot build them on a board with hay wire and expect other than the pleasure of tearing them down. To the contrary, after viewing some of the factory types which will be presented this fall and learning from them the average method used for shielding, one may then accomplish very ingenious and most acceptable receivers which should, and no doubt will prove a revelation to the constructor.

Shielding, to be effective, should employ either copper, brass or aluminum for the housing, aluminum being preferred with copper second and brass a poor third.

Shielding Details

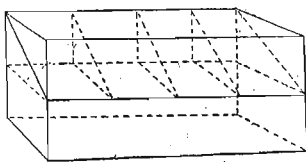
Of such completed models of receivers employing bridge circuits that I have seen, each seems to favor mounting the tuning condensers in a metal compartment just below or above the inductances, just compartment not to have any subdivisions, but following an oblong whose depth and height are equal. If mounted below, then the top of the housing is of sufficiently heavy stock to act as a support for the mounting of the inductance units or, as one might term it, a sub panel for the inductance members. Each inductance stage should, however, be also totally shielded, metal partitions between stages serving the purpose nicely. The total shield may then follow the general lines shown in figure 33 which is nothing more than an oblong metal cabinet divided with a horizontal metal sub panel, the top portion divided into stalls which are omitted in the lower portion. No attempt should be made to make any portion of the face of the shielding the operating or face panel. However, if one does not desire to use bakelite as a face panel, metal may be used, or, if convenient, a three-ply veneer wood panel may be designed.

I believe many of the factory made sets which will be offered this fall will show the use of metal or wood as face panels. One only needs to be careful relative to establishing shorts or unintentional grounds if metal is used.

While, for efficient shielding, a totality is desired, it is obviously impossible to accomplish this result so long as it is essential that leads pass, not only to the condensers, but also to the succeeding stages. However, if such openings as are necessary to pass the wires are made as small as possible, little reaction from this source will be had, while as such openings concern only six wires, one can readily so space them as to eliminate loop coupling in the high frequency wiring, and in the low potential as well.

Neutralizing Condensers

We now come to the most important part of our balancing system, viz., that which we can control, the variable balancing capacities. As possibly most constructors would use the standard, vernier, low maximum capacity condensers, let me assure you that they will only serve your purpose experimentally. Understand that in these circuits the balancing condensers are only used to equalize either the grid to plate capacity or the grid to filament capacity or both, and at no time will their maximum value be greater than possibly 15 micro-microfarads. Hence it is equally essential that they be located as close to where these capacities exist as is practical



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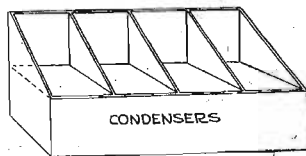


Figure 33

and that their adjustment entails an insulating medium. The standard old time book type condenser of very small size is

to date, the most practical to use and is easily made, although one's cleverness in design has, at this point, an opportunity for expression in a rare manner.

One of the greatest minds in Radio construction and design has often said, "If it is true that one profits most by his mistakes, then why not make a lot of mistakes and thus profit most?" which, in the abstract, is good advice so long as we do not make the same error twice. I am hoping each of you make a lot of mistakes in designing these low capacity condensers, as surely the Radio market sadly needs a good one that can be mounted where it will do the most good. Every time I look at the neutralizing condensers used in neutrodyne circuits I cannot resist mentally saying, "Another mistake!"

Compensating Condenser Location

As we are attempting to neutralize the plate-grid lumped capacities or, as before stated, the grid-filament capacities or both, isn't the sensible and logical position for our condensers on, or as close to, the socket as possible—just at the terminus of our lumped capacities? I wish also to give you this added thought, that, as the bottom of sockets seem to have no use other than as a supporting

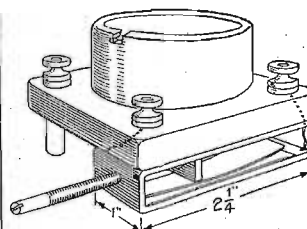


Figure 39

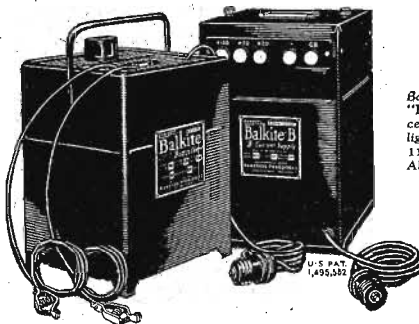
medium, then why not mount the socket base on pillars and place our condensers immediately beneath it. Surely the socket will not object, while it is my thought that at this location the condensers would be well out of the way, at the same time admitting of extremely short connecting leads.

Figure 39 shows such an arrangement while figure 40 indicates a suggested de-

(Continued on page 20)

Balkite Battery Charger. Charges 6 volt "A" storage batteries.

Price \$19.50
West of Rockies \$20
In Canada \$27.50



Balkite "B"—replaces "B" batteries and dry cells. Operates from light socket. 60 cycle 110-120 A. C. current. Also 50 cycle model.

Price \$55
In Canada \$75

A uniform, constant power supply for both "A" and "B" circuits

Here at last is a convenient and unflinching power supply for your radio set. Balkite Radio Power Units furnish constant uniform voltage to both circuits, and will give your radio set greater clarity, power and range. The Balkite Battery Charger keeps your "A" storage battery charged. Balkite "B" replaces "B" batteries entirely and supplies plate current from the light socket.

Based on the same principle, both the Balkite Battery Charger and Balkite "B" are entirely noiseless. They have no bulbs or moving parts, and nothing to break, adjust or get out of order. They have a very low current consumption, are simple and efficient in operation, and can be put in use at any time by merely connecting to a light socket. Both are guaranteed to give satisfaction.

Sold by leading radio dealers everywhere

FAN STEEL
Balkite Radio Power Units

BALKITE BATTERY CHARGER—BALKITE "B" PLATE CURRENT SUPPLY

Manufactured by FANSTEEL PRODUCTS COMPANY, Inc., North Chicago, Illinois

A. B. C. Course in Radio Fundamentals

Chapter XVI—Transmission of Electromagnetic Waves

By David Penn Moreton

THE transmission of intelligence by Radio is brought about by sending out from the transmitting point what are called electromagnetic waves, which produce an effect upon receiving equipment at the receiving stations within the zone in which these waves may be transmitted. Special equipment is required at the transmitting station for the production of these waves, and other special equipment is required at the receiving station for their reception. Since the transmission of electromagnetic waves is somewhat similar to that of other kinds of waves, such as light, sound, heat, water, etc., we will just discuss wave motion in a simple and general manner and then apply this discussion to electromagnetic waves.

In wave motion, a stress is transmitted from one point to another point in an elastic medium without any permanent displacement of the medium itself in the

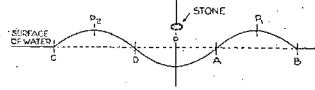


Figure 66

direction in which the stress is transmitted. For example, if a stone be dropped in a still pond at the point P, figure 66, an up and down motion of the water will be set up at P, which will be transmitted to a point at P₁ without any motion of the water from P to P₁, which can be proven by observing the behavior of a small float placed between the points P and P₁. When the stone was dropped at the point P, the water directly under it was displaced in all directions away from P toward the points P₁ and P₂, and will produce the bulges at these points which are called crests. These bulges or crests are due to the fact that the water which is displaced from the point P tends to raise the level all around P, but, on account of inertia, this cannot be done in a short time, which results in the level being raised at the points P₁ and P₂.

Analysis of Wave Motion

Now let us consider the action of the particles of water in the spaces AB and CD which correspond to a ring surrounding the point P, in which the water has been raised above the normal level. Due to the force of gravity acting on the water in this space, it will tend to seek the average or normal level and, in doing this, the crest APB to the right of P and the crest CPD to the left of P, will disappear, and on account of inertia, the particles of water will move beyond the average or normal level and a depression or trough will be created. The movement of the particles of water in this first ring, from a crest to a trough will cause the particles of water outside this ring to rise, and form a crest which, in turn, under the action of the gravitational forces, drop and form a trough, and cause the particles outside to rise and form a crest. The result is that the trough and the rest of the wave will appear to move in all directions away from the center of disturbance at the point P, and with a definite velocity.

The motion of the particles of water is limited to a small region around their position of rest, and the wave is transmitted by imparting this motion from one particle to another, and each particle, after the disturbance has passed, remains in practically the same position that it occupied. The motion of the particles is very complex and a complete analysis cannot be given here, but certain fundamental facts regarding it will be of interest because of the analogy between water waves and electromagnetic waves.

According to theory, which has been checked by experiment, the particles of water which are in the path of a wave, execute motions which are, in the simplest case, circular. Applying this idea of circular motion to the particles of water in figure 67, we find that a particle at the point A will be moving downward with a velocity which we may represent by V₁, at the point B the particles will be moving to the right in the direction of wave travel with a velocity V₂ and, at the point C, the particles are moving to the left in the opposite direction to the wave travel, with a velocity V₃. Every

particle of water involved in the transmission of the wave will be executing a circular motion in a clockwise direction. The formation of the crests or troughs is the result of the various particles being at any particular time at different stages of their circular motions. For example, where the particles are moving horizontally in the direction of the wave travel a crest will appear, since a large number of particles are then at or near the top of the circular path in which they travel. On the other hand when the particles are moving horizontally, but in the opposite direction to the direction in which the wave is being transmitted a trough will appear, since a large number of particles are then at, or near, the bottom of the circular path in which they travel.

Let us now consider the energy possessed by the particles of water in the various positions they have in their travel around their circular path. The energy possessed by these particles may be either

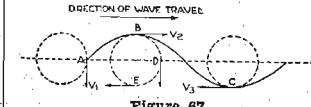


Figure 67

or both of two kinds: namely, potential and kinetic.

Potential energy is stored energy and is due to condition or position. The potential energy is stored in a clock or vicirola spring when this spring is wound up, and potential energy is stored in the weights of a grandfather clock when these weights are raised by winding the clock. Kinetic energy is the energy possessed by an object due to its motion. For example, a baseball thrown from one player to another possesses a certain amount of kinetic energy while it is speeding through the air.

Energy Transfer

Each of these forms of energy may be transformed into the other kind. When a baseball is thrown high into the air by a

player, the ball possesses kinetic energy due to its velocity when it leaves the hand of the player and no potential energy with respect to the hand of the player because it is on exactly the same level as the hand of the player. Now as the ball travels upward it is losing kinetic energy, since its velocity is decreasing, and at the same time it is gaining potential energy, since its elevation above the hand of the player is increasing.

The ball will continue to travel upward until it has lost all of its kinetic energy and, at this time, it will possess the maximum amount of potential energy. If there were no losses, due to friction of the air, the potential energy of the ball, in its uppermost position, with respect to the hand of the player, would be exactly equal to the kinetic energy possessed by the ball when it left the hand of the player. Now as the ball falls, it loses potential energy and gains kinetic energy, and the potential energy will be zero when it returns to the mitt of the player and the kinetic energy will be a maximum but not equal to the kinetic energy it had when it left the hand of the player due to losses such as the friction of the air.

Hair Spring Example

Another good example of the transformation of energy from one form to another is the hair spring and balance wheel of your watch. When the balance wheel comes to rest, it possesses no kinetic energy and there is potential energy stored in the hair spring. Now as the balance wheel rotates it gains in kinetic energy and the spring loses potential energy until the wheel reaches its mid position of travel when the kinetic energy is a maximum and the potential energy on the spring is zero. As the wheel travels to its next position of rest, it loses its kinetic energy and the spring gains in potential energy until the kinetic energy of the wheel is zero and the potential energy of the spring is a maximum. If there were no losses in this operation the wheel would oscillate back and forth

(Continued on page 21)

The Best Transformer Money Can Buy

You secure **Marvelous Reception** with these New **KARAS HARMONIK** Audio Frequency Amplifying Transformers

What Karas Harmoniks Do that Other Transformers Cannot Do

THEY amplify with **GREAT VOLUME** the extremely low frequency tones that other transformers fail to amplify at all—**KARAS HARMONIKS** also amplify **EQUALLY** all of the many vital harmonics and rich overtones that combine to form pleasing musical sounds.

With **KARAS HARMONIKS** there is no muffling of sounds—no fuzz on the edges of words—no thin, squeaky, distorted tones. Instead, **EVERY** tone is clean-cut, separate and distinct from every other tone—**natural**.

BEST FOR PORTABLE SETS
The Results of Karas Harmoniks

The result from any radio set of any and all efficient circuits is an outpouring from the loud speaker of soft, rich, round, full, mellow tones such as you have never before heard from any radio—a surprising volume of **REAL MUSIC** to which it is a delightful pleasure to listen. Price \$7.00 each. Order from your dealer if he has them, or direct from

KARAS ELECTRIC COMPANY
4049 North Rockwell Street, Chicago

Quality Parts Matched for Perfect Teamwork

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

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

FEDERAL TELEPHONE MANUFACTURING CORP.
Buffalo, N. Y.



Federal
Standard **RADIO** Products

Portable and Phonograph Super-Heterodyne

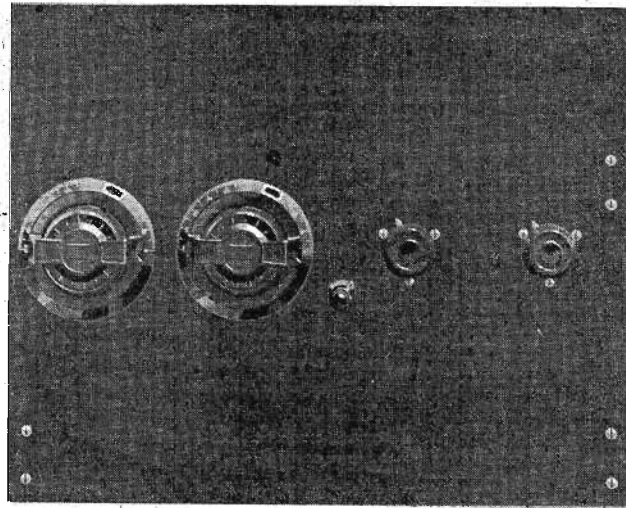
Part I—Analysis of Design

By John G. Ryan

IN PREVIOUS years, portable sets have always consisted of one, two or three tubes, with an occasional four tuber, which was to be operated from an antenna of some sort which usually consisted of a wire thrown over a tree branch or hastily strung between the summer bungalow and a tall tree. Although the five tube set, in the form of a neutrodyne or tuned R.F. receiver, was popular in 1924, it did not lend itself readily to portable use since these circuits were found to be very satisfactory on storage battery tubes, but not very efficient with the dry cell filament tubes. The broadcast situation which came about last fall made necessary the use of a receiver with a selectivity far in advance of the average five tube set, or the reflex, and as a consequence the super-heterodyne attained great popularity because of its remarkable ability to separate stations, even though within a few meters of each other. The Radio public has by now become more or less used to the principle of the super-heterodyne and to its construction and operation. So the writer in presenting a portable, which makes use of a super-heterodyne kit, does not feel that he is presenting something for Radio Digest readers which is beyond the ability of the average fan.

Why Super Is Preferable

Due to its tremendous sensitivity and long range the super-heterodyne can be operated from a loop antenna of small dimensions which makes it even more desirable for portable use. True, a neutrodyne or tuned R.F. set could be operated from a loop but it would be necessary to entirely enclose such a receiver within shielding so that there would be no interaction between the air core transformers and the loop antenna. Super-heterodyne transformers are not subject to this difficulty because they are usually encased in small metal containers, or have an iron core which limits the field around the coil, and greatly hinders the tendency to interact with other units. Because of the above mentioned facts a seven tube super-heterodyne can be built to occupy less actual space than a five tube re-



Front view of set showing arrangement of controls on panel.

ceiver which is still another point in its favor for use in portable sets. The super-heterodyne is much to be preferred because of the fact that only two tuning controls are necessary and these can be accurately logged so that stations will always be found at the same points on the dials.

When planning this set for portable use it occurred to the writer that if the set were designed only for such use that its useful period during a year would be limited to the time that people were on vacation which may vary between three weeks and three months. There seems to

be a demand from the public for a combination which will include the phonograph and the Radio. With the phonograph the user can have what he wants when he wants it, while, with the Radio, the entertainment is always changing and includes the very latest in both talks and music. Both of these home entertainment devices have much of merit and neither can be said to make the other unnecessary.

No one panel could be designed that would fit all makes and types of phonographs, so the writer has made the panel

LIST OF PARTS	
2 Variable condensers .0005 mfd.	\$ 10.00
1 Super-heterodyne kit	25.00
7 Cushion base 199 sockets	7.00
1 Potentiometer 400 ohm	2.25
1 Rheostat, 2 ohm	2.00
1 Audio frequency transformer	7.00
2 Grid Condensers with clips	.90
2 Grid leak cartridges, seven megohms	1.00
1 By-pass condenser .5 mfd.	.90
1 Fixed mica condenser .002 mfd	.75
1 Fixed mica condenser .002 mfd	.40
1 Panel 18"x14"x1/2"	5.50
1 Shelf 17"x3"x1/2"	1.50
1 Shelf 17"x6"x1/2"	3.00
4 Brackets with 6" depth	.60
2 Brackets 2" (if necessary for kit)	.20
1 Cabinet to suit	15.00
1 Small speaker	3.00
2 Vernier dials	7.00
Miscellaneous	2.00
Total cost	\$100.00
Accessories	
1 Loop Antenna, folding	\$ 10.00
6 Dry cells No. 6 (A battery)	3.00
7 Tubes UV-199 or C-299 type	21.00
4 Intermediate size B batteries	7.00
1 C battery 7 1/2-volt	.85
Total cost	\$ 41.85

of this set of a size that will fit two or three of the more popular upright models. A different type of construction would be desirable if the receiver were to be used in a horizontal position in a console model. As the set stands, it will contain its own batteries and its loud speaker while the loop antenna may be one of the folding type, of which there are so many on the market, or it may be fitted into the rear cover of this set on which it can swing to secure the desired directional effect.

There are some who may feel that a single stage of audio frequency amplification

(Continued on page 20)

That Very Natural Tone



of the Bristol Loud Speaker is not due to chance, but to a long-time experience in the manufacture of finely-adjusted scientific instruments.

For over 36 years The Bristol Company has been manufacturing Bristol's Recording Instruments—which measure and record the minute changes in heat, cold, humidity, electrical current, and numerous other properties.

That this experience and factory fitness is reflected in the sweet tone of the Bristol Loud Speaker is a very natural thing:

BRISTOL AUDIOPHONE Loud Speaker

For \$25 and \$30 you can get a Bristol Speaker; and there are others as low as \$12.50. Ask your dealer to send one out. Write us for Folder No. AY-3022, telling why the Bristol is such a delight to the ear.

THE BRISTOL COMPANY, WATERBURY, CONN.



An Advertisement We Did Not Write



Bluefield, W. Va.,
June 17, 1924.

All-American Radio Corp.,
Chicago, Illinois.

Gentlemen:

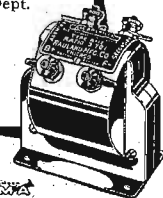
I certainly could expect no finer results from a transformer than I am now obtaining with your Audio Frequency Transformer.

I have used five stages of Audio Frequency Amplification with varying resistances across the secondaries and also with fixed condensers across the primaries or in series, and have perfect reception, which speaks well for Audio efficiency.

Yours very truly,

(Signed) R. L. Edmonson,

c/o St. Luke's Hospital and X-ray Dept.



To enjoy modern radio at its best, send 10 cents for the RADIO KEY BOOK

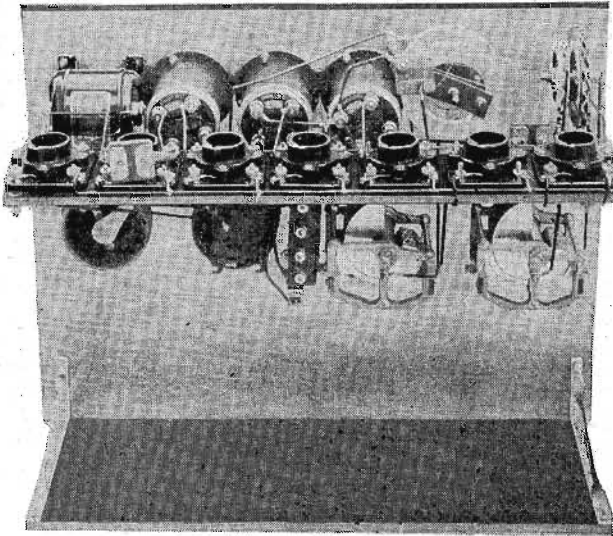
ALL-AMERICAN RADIO CORP.

E. N. BAILEY, President

4203 BELMONT AVENUE CHICAGO

ALL-AMERICAN

Largest Selling Transformers in the World



Rear view of set, showing sub panel and space for batteries and loud speaker.

PORTABLE SUPER-HET

(Continued from page 19)

tion, using the UV-199 or C-239 vacuum tubes, does not give sufficient volume, but the writer has found that when a single stage of this type follows a super-heterodyne receiver, the volume is plenty for nearly any use or location in which the receiver may be. The volume is not sufficient for dancing, but is of a round smooth quality that is most pleasing and there is practically no distortion. A group of 8 or 10 people may sit on the veranda or around a camp fire in the quiet of a summer evening and hear distinctly every word that is said, and enjoy the music without any effort to strain the sense of hearing.

After studying the front and rear views shown with this first article, the reader will note that the layout is subject to considerable variation to suit the individual needs or whims, and that the width of 18" is made necessary only because of the size of the super-heterodyne kit used. This kit was chosen because it is the largest of all those available, and takes up the greatest space, so the writer felt that no matter what kit Radio Digest readers might use there would be ample space for the various parts necessary. If you know of a kit which occupies less space, that you feel is efficient, it can be used with perfect confidence, and the width of the panel can be reduced, if that is necessary so the panel will go into your talking machine. All of the upright models have the sound chamber at the top and space in the bottom for records in which the partitions may be either horizontal or vertical. The width of this

lower compartment should be carefully measured and, if found to be less than 18 inches, the various units can be put somewhat closer together because the various parts are somewhat smaller. This is presuming that a smaller kit has been chosen.

Parts Used

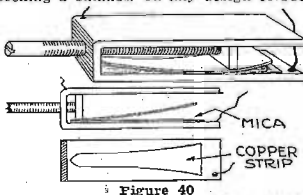
Super-heterodyne kits are largely a matter of personal preference, as they are all alike in principle, and it is only the small refinements here and there which make any difference between them. The writer prefers the kit used simply because the filter circuit consists of two tuned air core inductances, the coupling of which may be varied. The condensers should be of a good low loss type, in which pigtail furnish the connection to the rotor plates, and preferably there should be adjustable bearings so that the ease of tuning can be varied for smoothness and therefore delicacy of operation. The audio transformer should be one of the improved types which made their appearance on the market this past season and which contain large cores with sufficient wire to guarantee an impedance more than the tube impedance to which they are coupled. Variable grid leaks were not found to be necessary as the 199 tube used as a detector in the super-heterodyne does not appear to be particularly critical with regard to grid bias. The writer's set seems to work equally well without grid leaks of any kind, but a barely perceptible improvement in tone quality could be noticed when cartridges of from five to eight megohms were inserted.

There are some who will criticize this (Continued on page 22)

TUNED R.F. ADVANCES

(Continued from page 17)

sign which would permit of using an insulated adjustment screw and it is of the utmost importance that this adjustment be thoroughly insulated, in order that no capacity effect may be transferred from a screw driver or other media used when seeking a balance. In any design of such



minimum condenser, wherein a fixed plate is used, so taper it as to permit a graduated minimum. Figure 40 pictures my thought, in which you will note that, while a portion of the fixed plate is of the width of the mounting, at one end it tapers, at its apex, has followed close to a 45° angle. This permits the securing of values most minute if required.

There is no reason apparent why such condensers could not be made in a very substantial manner and I would be grateful to those of you who care to submit constructional designs for condensers which will mount on or underneath a socket. Don't try spending a lot of money in attempting to secure a patent on such a device; patents are expensive air castles as a rule, and lead to many disappointments. If you must have a patent, secure it in some field other than in Radio as Radio now has about eight thousand too many.

Patent a scheme to add six inches onto

a ditch digger's shovel at about half an hour before quitting time and make heaps of money, but in Radio, never! There must be over a hundred low loss variable condensers, most of them patented or living in hopes, each designed by Radio men and my thought is that most of them were treated shamefully in not letting the mechanical engineer design at least the mounting screws.

Looking Ahead

Next week I shall summarize the general picture story, not only of the Wheatstone Bridge circuits, but also have something to say about aerials and grounds. Every Radio set needs both of them and, while the press keeps harping upon the subject, still, but mighty few seem to realize the importance of the subject.

As I glance out over the roofs in my neighborhood I have counted sixty-two aerials. Of these, two appear to have been installed for Radio reception, while the others would make terribly poor clothes lines and, thank goodness, it is these chaps who refuse to listen to other than California stations, except when company comes.

Before closing, I want to answer a question, so often asked in my mail, and that is—"Is it possible to use a stage of radio frequency ahead of a three tube regenerator using tickler feedback without neutralizing it?" The answer is, that in most of such circuits, you can if you will use a UV-199 or C-239 in the radio frequency stage, and a separate filament control for it. The constants of the circuit and its arrangement have much to do with its use, but, in general, this scheme works very satisfactorily.

(TO BE CONTINUED)

Instead of the twisted loop method, tap a coil by slipping an "O. K." paper fastener over the bare wire and soldering it. Mica put under the wire temporarily will keep the iron from burning it.

The NEW Radio Book



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

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

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

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

For the Man That Bought His Set

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

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

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

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Unicontrol Regenerative Receiver

Dial Device Controls Tickler Regeneration

So much trouble has been encountered by the use of regenerative receivers in an oscillating condition, that I designed a one dial regenerative receiver which will not oscillate if handled properly and yet

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

brings in all wave lengths with maximum regeneration and this by tuning only one dial.

The circuit is one generally used in regenerative receivers and uses a three-cir-

A. B. C. RADIO COURSE

(Continued from page 18)

indefinitely after it was set in motion. The losses are overcome by the main spring of the watch, whose potential energy is available after the watch is wound.

Considering now the particles of water involved in the transmission of a wave as shown in figure 67. A particle of water at the point B, possesses potential energy due to its elevation above the average or normal surface of the water and also some kinetic energy in the direction of the wave travel since it has a velocity in that direction. Now as the particle continues to rotate, its displacement from the average or normal level grows less and less and so does the component of its velocity in the direction of the wave travel and, in the position D, its potential energy is zero and also its kinetic energy in the direction of wave travel is zero. As the particle rotates still further, its potential energy becomes negative as it is below the average or normal level of the water and its kinetic energy increases and reaches its maximum value at the point E, but in the opposite direction to the direction of the wave travel. At the point E, the kinetic and potential energy of the particle are exactly equal to the value they had at the point B, but opposite in sign.

Kinetic Plus Potential Energy

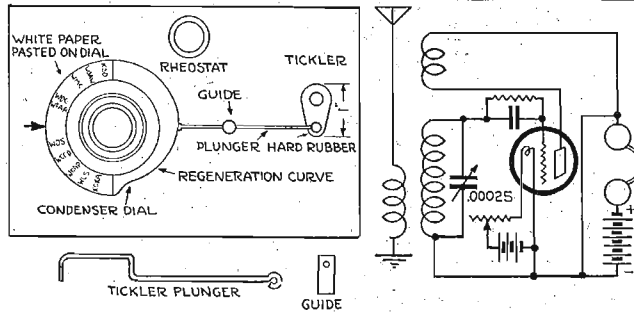
The potential energy of a particle at any point is exactly equal to the kinetic energy in the direction of wave travel, provided there is no change in the shape of the wave taking place. Due to this relation of potential and kinetic energy, there must be a fixed relation between the displacement of a particle above or below the average or normal level of the water and the component of the velocity of the same particle parallel to the direction of wave travel.

The total energy of a particle of water, potential and kinetic, in the direction of wave travel, is continually changing as the wave progresses, the particle in question passing its energy along to the particle adjacent to it in the direction of wave travel, and this transfer of energy from one particle to another is the underlying principle of all wave motion in water.

Electromagnetic waves are due to a disturbance of an electromagnetic nature and are such that they produce at points all around the center of disturbance a varying magnetic and a varying electric field. For example, if a wire, in space, has an alternating current established in it for a short interval of time it will set up an alternating magnetic field and an alternating electric field all around itself, and these fields starting from the vicinity of the conductor will travel away from it with the velocity of light. To set up these fields requires energy, which means that a certain amount of energy must be drawn from that available in the conductor in order that the electromagnetic disturbance be created at all. This transfer of energy from the wire to the field is known as "electromagnetic radiation" or simply "radiation."

(An explanation of electromagnetic radiation and how it is caused and controlled, will form the basis of Professor Moreton's article next week.—Editor's Note.)

DETAILS OF UNICONTROL DEVICE



cut tuner. My tuner was homemade, basket type winding and the tickler shaft is a celluloid knitting needle. The diagram shows how regeneration was obtained with the one dial. The guide for the tickler control plunger is a short piece of knitting needle driven tightly into the panel and a hole drilled through it to allow the plunger to slide easily. A rubber band was hooked over a pin in the tickler shaft and given a turn around the shaft and the end fastened to the baseboard so as to give a twisting motion to the tickler shaft and cause the plunger to ride firmly but lightly on the edge of the dial.

The builder must use great care in cutting the regeneration curve on the dial; use a small file and penknife and try the dial often to see that you are not cutting too deep in spots.

When the curve is properly cut there will be a light hissing sound as the dial is turned over the entire scale but no clicks, as these denote oscillation of the tube. Be sure the filament rheostat is turned on far enough when cutting the curve or you may not get it exactly right.

If by mistake you cut the dial too deeply in places and cause the tube to oscillate at these points, slip the tickler back slightly on the shaft so the tube does not oscillate at these points and work the high points down slowly until the tube is on the verge of oscillation over the whole scale. When cutting the curve on the dial have aerial and ground connected as for receiving, and be very care-

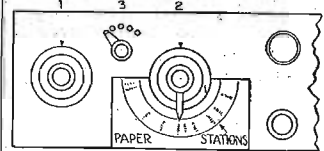
ful to get the dial on the shaft in the same position each time when putting it on for trial.

This receiver will not oscillate when in use unless the filament is turned on brighter than when the regeneration curve was cut.

The tickler plunger is made from No. 14 copper wire and is flattened on the end which rests on the dial. A little vaseline on the edge of the dial makes it run smoother.—Byrl Stoll, Buffalo, Kansas.

Dial Charts

Here is an easy way to have a less informed member of the family tune, in any station desired. Instead of lengthy charts I do not tune to numbers and meters but to the station direct. It may not work

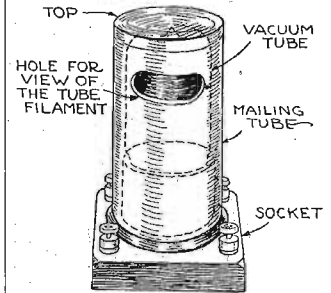


so good on other sets but it could not work better on my Cockaday set.

Take a partly stiff paper and cut it to fit below dial 2 so it will slip under the dial, as most dials are a little away from the panel. Cut a tin or cardboard pointer and glue it exactly in the center of the

Tube Covers Protect Against Dropped Tool

Many a tube has been broken by something falling on it. This can be avoided by slipping a section of a mailing tube



over it and closing the upper end. A hole is cut in the side for a clear view of the filament.—Bernard H. Porter, Houlton, Maine.

blank space opposite the graduations on the dial. The pointer should project one inch over the dial forming quite a circle on the paper. Draw a line along the paper forming an arc along which the tip of the pointer moves. This dial should be the wave length dial and it will be found very accurate and stations will always be located at the same place. When each new station is brought in mark down the call letters of the station opposite the pointer setting. If your receiver also has a tap switch cutting in more or less turns mark the number of the tap used after the call letters. Thus if an inexperienced member of the family wishes to tune in it is only necessary to set the pointer and the tap switch and pull out the battery switch.—Max Mueller, Thiensville, Wis.

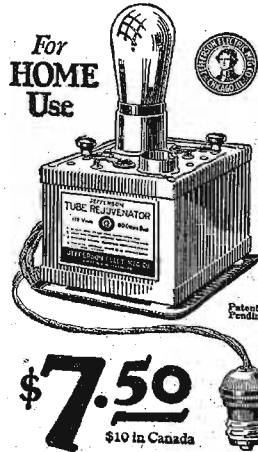
When attaching an aerial to a tree, have the wire insulated about 15 feet from the tree to avoid loss.

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Questions and Answers

Fourner Super; B Eliminator

(13882) RLD, Memphis, Tenn.

Can you give me a little more information on the four filter Fourner super? How about using some readymade coil for an antenna coil? Couldn't I use a Bremer Tully tuner or something of the kind? Which make would you advise? Do you think the homemade one would be superior? I haven't very much room for a large coil of any kind.

What do you think of using a B battery eliminator with the same voltage on all plates, e.g. 100 volts, instead of varying the plate voltages?

A.—The low loss coupler mentioned can be purchased from the Davenport Radio Laboratory of Davenport, Iowa, but you can use any other type of coupler providing it is so made that you can tap in on the secondary at the center point. Uncle Sam Electric company of Plainfield, N. J., make a very good coupler which occupies but little space and which they call their "baby tuner."

The four filter super can be run on a B eliminator. The writer is doing that now. The set seems to work equally well whether the detectors have 45 volts or the same voltage as the amplifiers.

Masterpiece Kit Troubles

(13951) RB, Bridgeport, Ohio.

I am having built a five tube low loss neutrodyne, using Freshman low loss coils and would like to know what is wrong. If you fix the coils the way the Freshman Masterpiece coils are mounted on the condensers, the set will squeal, but if you turn the coils straight out from the condensers it does not squeal but distance suffers.

A.—When the coils are mounted flat against the rear of the condenser as Freshman does in his receivers, you are evidently getting the benefits of regeneration and therefore you get the distance. When you mount the coils at right angles to that position you evidently lose the regeneration and cut down your range.

It should not prove difficult to mount the coils at some angle between these two positions so that regeneration is secured to a controllable degree, and that you have range without squeal. It will be impossible to find any position at which you can have regeneration over the entire wave length range, but by turning the coils at different angles you will find a position at which you will have maximum possible regeneration at about 225 meters with less regeneration and less range as you reach the higher wave lengths.

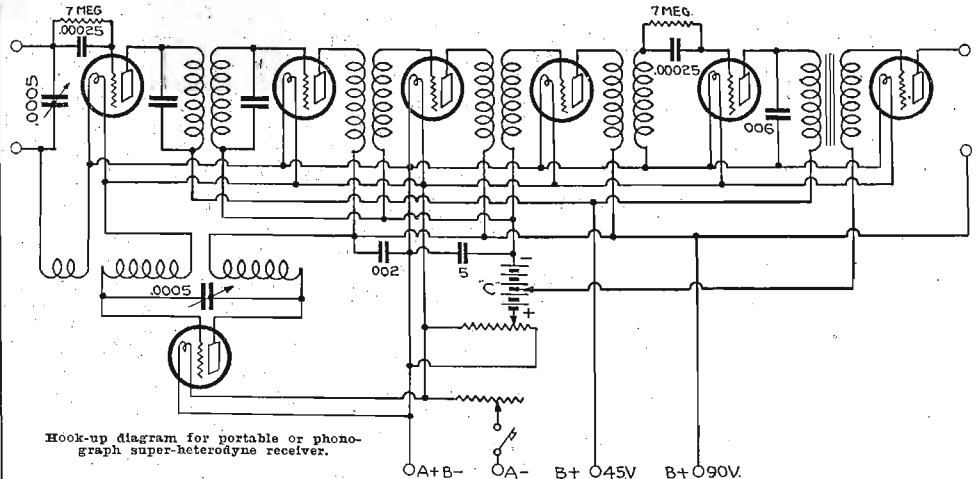
Your range at 528 meters will be only about one-half that at 275 meters. This is a condition which cannot be avoided with the apparatus which you have.

Locating Trouble

When a set fails to produce a signal the trouble may be caused by incorrect connection of A or B batteries, defective tubes, short circuits in the set or aerial, broken or loose connections, fraying of the loud speaker or phone cord, or failure of the spring tension in the sockets or phone jacks.

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PORTABLE SUPER-HET

(Continued from page 20)

design because it has only one filament rheostat, but no improvement could be noticed when four rheostats were used so it was decided to cut out all but one. This leaves the panel with a pleasant scarcity of controls and those shown are as follows: Looking at the front view, the large dial at the left is the oscillator dial, while the other large dial controls the wave length of the loop tuning circuit. The filament switch is next, and the first knob is the potentiometer which controls the bias on the grids of the intermediate amplifiers and thus the regeneration. The other knob controls the rheostat and the filament brilliancy.

There is one odd thing about this receiver for which the writer has no explanation, but is quite pleased with the result. The potentiometer was not sufficient in itself to produce enough grid bias for maximum possible range and volume. It was found necessary to insert 7½ volts of C battery between the center connection of the potentiometer and the three grid returns. The result was a very pleasing surprise, as a millimeter in the minus B lead from the batteries now showed that the set was drawing only 17 milliamperes instead of 29 as it had at first. Since most of the super-heterodynes which have been designed in the last few months draw anywhere from 25 to 40 milliamperes, this was felt to be a decided improvement of particular value in a portable where the B batteries could be of only the intermediate size. There is not a great deal of difference

between this receiver and the set which the writer built and described last fall under the title of "The Simplest Possible Super," and, as a matter of fact, the wiring diagram of the Simplest Super could be used for this receiver providing the proper kit were employed.

Battery Location

The photograph shown with this first article does not make clear the installation of either batteries or loud speaker, but the photograph will be published later which will do so. Looking at the second photo which accompanies this article, and which has been taken from the rear, six No. 6 dry cells can be placed on the bottom shelf in the lower right corner just below the variable condensers while four upright intermediate size B batteries can be placed at the left, below the rheostat and potentiometer. The loud speaker may occupy a space between the rheostat and potentiometer and the back of the cabinet, and may also

extend across behind the condensers if a long narrow speaker is more readily obtainable. Another variation that was found possible consists of placing a baby speaker of the dragonfly size on the lower shelf at the left and there was plenty of room for it to come up behind the rheostat. The A batteries were placed as before beneath the condensers, three cells as a bottom layer and three cells on top of them, lying flat, while the B batteries were stood upright on top of the dry cells and extending up behind the variable condensers. The batteries can be held together in any position desired by means of heavy friction tape.

(The actual construction is withheld until the next issue to give our readers time to procure the various parts necessary for this set. Those living in smaller towns may have to send away for some of the parts.—Editor's Note.)

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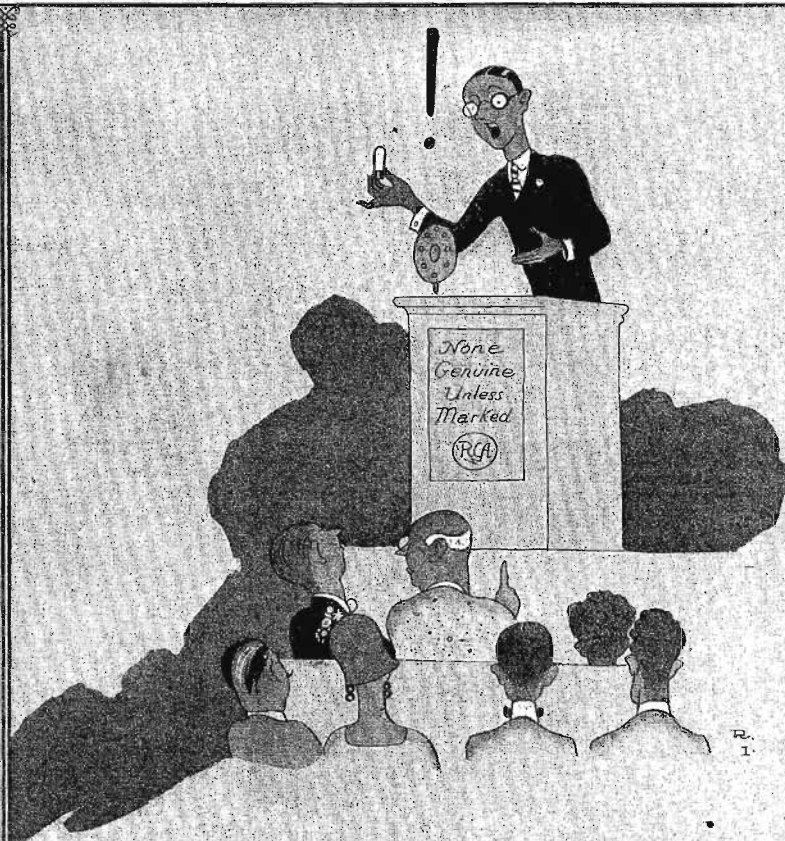
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