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Harkness Neutroflex Compact Set—H. J. Marx; 8 Days' Advance Programs; "The Neutrodyne Circuit"—P. J. Clute; Edelman's A-B-C's for Beginners

Radio Digest

EVERY WEEK PROGRAMS Illustrated TEN CENTS

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PROPOSE TAX ON SETS

CARROLL'S VANITIES SHOW RADIO VALUE

ON AIR AT KYW APRIL 22 TO PROVE GOOD AGAIN

Success of Gigantic Musical Comedy, Opening in Chicago, Due Much to Broadcasts

CHICAGO. Does broadcasting of theatrical productions decrease box office receipts? Earl Carroll, owner and producer of Earl Carroll's Vanities, which comes to the Colonial Theater here for an indefinite run, Easter Monday, says "no" in a most emphatic manner and produced a letter from a mass of thousands in which the writer declared that he would have to stop listening in, because reception of Vanities cost him fifty-five dollars when his wife insisted that he take the entire family to see the show.

Earl Carroll is the pioneer in broadcasting musical comedy productions. He is the only producer in America who has successfully broken down the obstacles placed in his way by the various managers' associations and theater owners who, up to the time Mr. Carroll came along, had the fixed idea that broadcasting hurt business.

Broadcasting Swells Box Office

Since the Earl Carroll Vanities left the Earl Carroll Theater in New York City for a limited tour of the eastern states on the way to Chicago, the first act of this wonderful play has been broadcast from the theater in Pittsburgh, Washington, Baltimore, Boston, Cleveland, Detroit, Colum-

(Continued on page 3)

Mitzle, the famous international musical comedy actress and star of "The Magic Ring" was heard over the air recently, when the entire show was broadcast from WIP, Philadelphia.

Angelo Devoto recently treated WLW fans to a very pleasing program of song and violin numbers. Miss Devoto, although only nineteen years of age, is a talented singer, musician and dancer, and is well on her way to stardom. Young & Carl

Margaret Clark, leading lady of the KGO Radio Dramatic Players, was heard recently as Sylvia Fair, when the drama "The Famous Mrs. Fair" was broadcast from this station.

LISTENER TO PAY COST IF BILL PASSES

Senate Committee Adds Ten Per Cent Excise on Parts and Sets

Would Repeal Candy Tax

Listening In Suddenly Becomes Luxury—Radio Administration Won't Get New Revenue

(By L. M. Lamm, Staff Correspondent)

WASHINGTON.—The radical proposal that a ten per cent tax be levied on all Radio receiving sets, parts and accessorics, including tubes, has been made by the Senate finance committee, considering the revenue bill now before it. The tax, the committee has voted, would be paid at the source of manufacture, but Radiophans generally know that the tax, multiplied by costs of distribution, will be passed on to them.

Is a Radio Set a Luxury?

Why radio sets and parts should be taxed, is the foremost question in the minds of listeners in. Why, they ask, should such a tax be levied when musical

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PROPOSE TAX ON SETS

(Continued from page 1)

instruments are tax free—and musical instruments are not even educational. On the other hand Radio sets, and consequently the parts that go to make up sets, have proven to be the greatest source of education since the advent of printing presses—which are also tax free.

What President Coolidge Says

Discussing the proposed Radio tax, President Coolidge stated that he is not in favor of any new kinds of taxes being imposed. He said that the business of the country should be so conducted that no new taxes are necessary.

It is understood that he modified his statement somewhat by stating that the Senate finance committee might find it necessary to change from one kind of tax to another, and that if that is the case with the Radio tax, he would not oppose it.

Critics of the proposed tax, fearsome of additional beaurocracy, attack the Senate committee on the basis that the Radio "manufacturer's" tax is but another form of direct taxation of the people.

Would Class Radio Reception as Luxury

At the same time that the Senate committee voted to levy the ten per cent Radio tax, the body approved a reduction in automobile taxes and repeal of the candy tax, voted by the House. The committee also proposed a ten per cent tax on Mah Jongg sets.

It is evident that the game of Mah Jongg is merely a luxury, designed to pass leisure time, but it remains to be explained how the Senate Finance committee can consider the broadcasting and reception of educational lectures and talks, music memory contests, stock and market quotations weather reports and news bulletins as anything other than first-class necessities.

Tax Proposal Made Without Figures

The proposal accepted and voted favorable by the Senate finance committee, that Radio sets and parts be taxed, was originated by Senator McLean of Connecticut. It is said that the committee had no figures available upon which to base the probable collection of the tax, and that the committee added it with several other new taxes in a blind effort to avoid the deficit which is threatened under the Mellon tax reduction bill as it now stands.

If, as statistics would indicate, sales in the Radio industry amount to $350,000,000 for the fiscal year, the manufacturers' sales figures will be close to $150,000,000. The proposed tax of ten per cent then, levied at the source of manufacture, would yield the government $15,000,000, less the cost of collection.

Would Money Go to Radio Administration?

The revenue so made available would amount to probably $13,500,000. The money evidently would not go toward helping pay for the administration of Radio affairs, according to the much sliced and deficient appropriation finally allowed the Radio section of the Department of Commerce for the ensuing year.

The case of the poorly-funded Radio section is pitiable, considering the vast fund which would be made available by the proposed Radio tax. Here is what happened:

Radio experts of the department of Commerce asked the director of the budget for an appropriation of $215,000 for the forthcoming fiscal year. This sum was considered extremely small in the light of the many needs of the Radio section. The budget director suggested that this low figure be cut to $180,278—but when the committee reported the appropriation bill to the House, the budget allowance even for the Radio section was cut again—this time to $158,778, an increase of but $2,000 over the past year's appropriation.

Even last year's appropriation was considered entirely inadequate to carry on the work of the Radio section, much of which was necessarily slighted to the point almost of inefficiency.

Those Responsible for Radio Set Tax

For Radiophans and other interested parties desiring to communicate with the Senate finance committee relative to the proposed tax, the following list of Senators who are members of the committee is given:

Simmons, N. C.	Elkins, W. Va.
McLean, Conn.	Curtis, Kans.
Watson, Ind.	Gerry, R. I.
Reed, Penna.	Reed, Mo.
McCormick, Ill.	Walsh, Mass.
Ernst, Ky.	Harrison, Miss.
Jones, N. M.	King, Utah
Smoot, Utah	Stanfield, Ore.

La Follette, Wis.

The amusement tax, providing the revenue bill is passed, will allow admissions under fifty cents to go free. Automobiles will be taxed but three per cent, and automobile accessories will bear an excise of only two and one-half per cent.

Coolidge on Air April 22

NEW YORK.—President Coolidge and Frank Noyes, president of the Associated Press, will address a luncheon of the Associated Press at the Waldorf Astoria, April 22, from 1:30 to 4 p. m., Eastern time. WEAF will broadcast the speeches.

Senate Passes Howell Bill

WASHINGTON.—Senator Howell's bill, declaring the air to be the inalienable possession of the people, passed the Senate last week, with practically no debate.

250,000 TELEGRAMS SUPPORT DILL BILL

FANS EXPRESS DESIRE TO HAVE TAX FREE MUSIC

Wires, Letters and Postcards Flood Senatorial Mail When Listeners Join Song Fight

NEW YORK.—According to advices received from Paul B. Klugh, executive chairman of the National Association of Broadcasters, hundreds of stations throughout the country recently advised their listeners "to put a million letters and telegrams into Washington," urging the support of the bill introduced by Senator Dill of Washington modifying the copyright law, particularly as it effects Radio.

From all reports, this had succeeded greatly beyond all expectations, as over 250,000 telegrams, exclusive of letters and postcards have reached Senators and Congressmen since the public were first asked to telegraph or write.

Station KFI Alone Raises 50,000 Wires.

When Station KFI went on the air asking all Radiophans interested in the passage of this bill, to wire their Congressman, one telegraph company sent more than 50,000 telegrams to Washington from Southern California alone.

One telegraph company, anticipating an avalanche of telegrams to Washington, had forms printed. All the listeners in had to do was pay seventy cents and sign the printed form. The telegraph company did the rest. The form telegram was called the Dill bill wire.

Dill Bill Almost Sure to Pass.

So much excitement has been raised that studios throughout the country were literally flooded with telephone messages. The response to the request for telegrams to go to Washington, certainly indicated an active interest in the future of Radio.

At the time of writing, the disposition of the Dill bill had not been settled, but owing to the flood of letters and telegrams pouring into Washington, the copyright law will no doubt be amended by Congress to allow the broadcasting of music tax free.

The copyright law was passed years before broadcasting was even dreamed of. The men who framed the law naturally did not have the slightest conception of this great public service.

Wanamaker Broadcasts Through Station WJZ

Radio Carnival Heard in London with Ease

NEW YORK.—During the recent Radio carnival held here by the Wanamaker store, broadcasting through the courtesy of station WJZ, a number of surprises were given to the staid old Gothamites. Owners of one tube and crystal sets were astonished to hear "The Voice of the South," and "The Call of the North" as plainly as the local stations. This was the climax of a week of superb entertainment given by the store.

The announcers from WSB and WLAG were imported for this occasion, thereby explaining the marvelous phenomena of hearing these voices.

Unbroken and undistorted, the program was heard in its entirety in London. Radiograms and cables from London, and ships at sea were received, reporting concert clear and excellent.

Vandals Wreck Station and Studio in Newark

NEWARK, N. J.—Radio vandals working with a thorough knowledge of the subject of their wrath practically wrecked the nearly completed studio and station of WBS here recently.

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Looking Ahead

More Neutrodyne Information will be given next week by Peter J. M. Clute in his series, "What's Wrong with Your Receiving Set"? Mr. Clute begins his neutrodyne article this issue.

Miloplex Celebrated and Long-Heralded Interview—in which much of the life of the Mystery Man is divulged—comes next issue. Aha, the plot thickens!

Resistance and Its Use in Radio is the next subject of Paul Edelman. In his easily understood style, Mr. Edelman will tell what the purpose of resistance is in a Radio part, be it rheostat, grid leak or potentiometer.

Inductance Alone, No Capacities, are used to tune the efficient set H. M. Taylor will describe next week. Promised this week, but you may be sure of reading about it next issue.

"Fallacy of Trick Circuits," by Thomas W. Benson, will have a third part. Read it next week and save your money from costly failures.

An Eight-Tube Super-Heterodyne will be described in detail beginning soon. The "super-het" is being tested and photographed, and it acts as well as it looks.

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CARROLL'S VANITIES SHOW RADIO VALUE

ON AIR AT KYW APRIL 22 TO PROVE GOOD AGAIN

Success of Gigantic Musical Comedy, Opening in Chicago, Due Much to Broadcasts

(Continued from page 1)

bus, Cincinnati, Indianapolis, St. Louis, and now arrangements have been made with Station KYW here to have the entire first act broadcast on the Tuesday night following Easter, the night after the opening.

Whatever objections managers and managers' associations had to broadcasting shows from the stage prior to the advent of Mr. Carroll's wonder play were swept aside by the tremendous response from the public. The box office receipts literally skyrocketed, and the management of both the production and the theater deluged with mail and telegrams as well as telephone messages voicing the approval of the show and asking for more.

Earl Carroll, Philanthropist

Mr. Carroll has been congratulated by fans all over the globe for the wonderful fight he has put up in defense of broadcasting, but he modestly declares that the letters he has received from bedridden invalids, cripples and those living in remote places without a chance of ever coming to a theater, have more than repaid him for any trouble or inconvenience he has been put to in the matter.

The bewitching Peggy Joyce, who heads the long list of feminine loveliness, can almost be visualized as she makes her grand entrance to the stirring strains of "Pretty Peggy." The uproarious fun occasioned by Joe Cook, master comedian of the American stage, causes giggles, chuckles and finally long, loud laughs to echo around the earth as those in the remotest districts listen to his mirth-provoking clowning.

Long List of Stars and Beauties

In addition to the two stars mentioned above there is Don Barclay, L. Barton Evans, Frank Leslie, Irene Ricardo, Marguerite Davies, Dorothy Knapp, Mlle. Renova, Harry Burns, Charles Senna, Charles Callahan, Carlena Diamond, Ami Revere, John Byam, Claire Elgin, Lota Cheeke, Cardinal Pears, Ruth Oswald, Al Clair, Thelma DeLorez, Betty Fitch, Vera King, Elsie Lombard, Renoff, Vaughn Hyde, Flo Gillingham, Portland Hoffa, Frank Blyler, Elsie Neal, Lucille Moore, Brooks Hall, Pat Patterson, and a veritable regiment of the most dazzling beauties ever seen on any stage.

Theater owners and managers all over the world have their eyes focused on the fight which Mr. Carroll has been waging against traditions and the old fogy ideas entertained by the various managers' associations.

They see the box office receipts climb in every city where Vanities has played and broadcast, yet many of them hesitate.

Carroll to Broadcast Other Productions

Not alone is Mr. Carroll sold on broadcasting his production of Vanities, but he is also going to take the air route to millions in every part of the world with his great dramatic production, "White Cargo," now having a phenomenal run at the Daly Theater, New York, and on the occasion of opening his London company of "White Cargo" he will broadcast from the heart of the British Empire the performance by the English company so that the thousands upon thousands who have enjoyed the performance in New York by an American company will have the chance to compare the two organizations.

Chicago is the first city Mr. Carroll has invaded with his huge production (there are 128 people in the cast) which has offered no objection to his broadcasting the first act of Vanities. If anything, this proves that the news of the huge success attending the former experiments have preceded the special train which brings the greatest of all musical revues to the metropolis of the west.

PROGRAMS 'IMMORAL, PASTOR ASKS CENSOR

PHILADELPHIA—At a recent convention here of Methodist ministers, Rev. G. D. C. Hanna urged that a censor be appointed for broadcasting stations. He said that some action should also be taken to compel stations to broadcast religious devotion each day for half an hour. He charges immoral and trifling entertainment fills the ether lanes. "Blatant outbursts of jazz," he said "are the chief things I hear when donning a headset." No action was taken on the suggestion, however.

WBAV ALARM CLOCK WAKES UP HIS WIFE

COLUMBUS, O.—A small alarm clock at WBAV here, recently awakened more response from Radio listeners than any other device that has been tried, judging from the number of letters and cards received. The clock was placed near the microphone for a few moments. Shortly afterward the alarm was sounded. Next day missives flooded in. One man declared that his wife, taking a nap while he listened in on the loud speaker, rolled off the davenport with a 5:30 a. m. expression on her face.

LISTENING IN ON THE MAKE-UP

The fairer sex has been said to have kept nearly everything imaginable in the large, suitcase-like vanity cases. Here we have a new proof of the assertion. Miss Orabelle Roggeveen, Chicago, powders her nose while she listens in (to beauty hints?) on her homemade, vanity case crystal set, entered recently in a freak set contest. © U. & U.

Hawaii Hears Program from Station WOS Every Night

JEFFERSON CITY, MO.—A. F. Costa, of Wailuku, Hawaii, has written Station WOS, the Missouri State Marketing Bureau here, that he has been able to hear WOS regularly and clearly. On March 12 and 14 Mr. Costa listened to prearranged programs and heard them both loud.

$331,849 Value of Radio Exports During January

WASHINGTON, D. C.—There were 184,965 pounds of Radio apparatus exported during January valued at $331,849 according to figures just made public by the Department of Commerce. Of this amount by far the largest went to Canada with a value of $160,282.

CKAC BROADCASTS IN TWO LANGUAGES

UNIQUE SERVICE CATERS TO VARIED TONGUES

Intricate Translating System Detracts Little from Speed of Sending News Flashes

MONTREAL, QUE.—Of the scores of thousands who have followed the Canadian Hockey Championship series played in Ottawa and Montreal, through Station CKAC, La Presse, Montreal, very few are aware of the added work involved in such a service, not from the mere broadcasting of up-to-the-minute results, but from the necessary bilingual point of view.

From isolated spots in Northern Canada, from large cities in the far West, from crowded towns in the East and South, messages have come to Station CKAC reporting a faultless reception of the entire series, and all bearing expression of wonder at the rapidity of "the two-languages" transmission.

Caters to Two Languages

The service of Station CKAC is unique inasmuch as it caters to two different races, by necessity. Though in this old province of Quebec, Scotch and French mingle together most friendly, speaking either language in the street, the household conversation is carried out in its respective native tongue, and the growing or older generation, in most cases, understand its mother tongue with more facility. Therefore CKAC hurls everything in the air in the official languages of this American continent "Switzerland."

In order to do this, remote broadcasting is difficult because of the impossibility of broadcasting from a ringside fight or games as they go along. To compensate, CKAC, with the co-operation of the Canadian National railways, who by the way, are ardent Radio entertainers, saving no expense or labor to fill the Radiophans' wants, provide operator-reporters at the ringside.

Translators at "Mike"

These men use direct, private wires to the studio, where an expert operator receives the flashes of the proceedings as fast as telegraphy will express. Alongside the receiving operator, are two translators deciphering English into French or vice versa. It is then passed on to the announcer who does the rest of the work.

The hockey games from Ottawa were broadcast but two or three minutes behind actual playing time, and scoring was announced within thirty seconds of the point itself. By this dual procedure of giving the Canadian National game series results, Radiophans from among five millions of French Canadians within Canada, New England and western states were pleased as well as any other from among the English speaking community.

WOR Tries Its Fans on Mental Telepathy

Newark Makes Tryout After WJAZ Tests Its Listeners

NEWARK, N. J.—Much discussion transpires among psychologists and others over the question whether thought transference or mental telepathy occurs; and most scientists who have given the question serious thought are inclined to believe that it does occur.

The results of the recent telepathic test tried at WJAZ, now WGN, Tribune-Zenith station, Chicago, have led Station WOR of this city to try the experiment on eastern listeners. In conjunction with J. Malcolm Bird, noted psychologist, WOR recently gave its listeners an opportunity to participate.

Letters and telegrams are still coming in and figures are not as yet available on the success of the stunt. The tests given were, in many ways, similar to those used at WGN.

THE ANTENNA BROTHERS — Spir L. and Lew P. — A Good "Judge" of Sets

MORE THAN BILLION PEOPLE WGN REACH

WORLD'S POPULATION, MINUS 2%, MIGHT HEAR

Capt. W. Evans, U.S.N., Gives Idea of Significance of Chicago Station's New World Record

By Capt. W. Evans, U. S. N., Commandant U. S. Naval Training Station, Great Lakes, Ill.

WOULD you believe that it is possible for 1,713,000,000 people, 98 per cent of the population of the world, to listen in to the message of a single broadcasting station without help of relay? The statement seems exaggerated, but let us see.

CAPT. W. EVANS, U.S.N.

On Sunday morning, March 31, between the hours of three and five, Central time, WGN, the Chicago Tribune-Zenith station, succeeded in transmitting the voice as far as Hobart, Tasmania. A new world record for broadcasting was established. The distance from Chicago, measured on the Great Circle (airline) route to Hobart, Tasmania, is 8,409 nautical miles (9,670 land or statute miles). I am indebted to Lieutenant Melvin C. Kent, U. S. N., officer in charge of the naval branch hydrographic office in Chicago, for the measurement of this distance.

A nautical mile is a geographic mile, that is, it is a minute of arc on the earth's surface. There are 360 degrees in a complete circumference of the earth's surface, and each degree represents 60 minutes, or 60 geographic miles. Seagoing people call these nautical miles. (A statute, or land, mile, the mile commonly known to everyone, is shorter than a nautical mile. The latter is equal roughly to 1.15 statute miles.)

A Voice Almost Encompasses Earth

Now, as there are 360 degrees in one complete circumference of the earth, and 60 minutes or nautical miles for every degree, the circumference of the earth's surface is equal to 21,600 nautical miles, or half the circumference, known as the semi-circumference, is equal to 10,800 nautical miles.

Subtracting the distance from Chicago to Hobart, Tasmania, from the semi-circumference, we obtain a difference of 2,391, or roughly 2,400 nautical miles. In other words, the voice transmitted over the WGN microphone at the time of the test reached within 2,400 nautical miles of half the distance around the world.

But as the voice theoretically was carried by Radio an equal distance in all directions, it means that the message covered the larger portion of the earth's surface, and had it carried 2,400 miles further, would have encompassed the earth, with all its population.

But Two Per Cent World's Population Untouched

The present population of the earth is approximately 1,748,000,000 people of all races. The population of the small area uncovered by the broadcast is only about two per cent of the total population of the earth, and the small area in square miles is but about eleven per cent of the total area of the earth's surface.

It is very simple to demonstrate the foregoing and very interesting to see the results.

To make the demonstration, procure an ordinary globe of the earth, such as are common in schools and many homes, a string, a pin and a pencil.

For all practical purposes the earth is a sphere (it is only slightly flattened at the poles). Chicago can be considered one of the poles, and a point directly opposite Chicago on the other side of the earth can be considered the other pole.

How to Demonstrate Area Covered

The latitude of Chicago is approximately 42° north; and longitude, approximately 88° west. Let us call this position the north pole. The opposite pole is 42° south latitude and 92° east longitude. We will call this latter position the south pole.

With one end of the string secured to a pin which is sticking in the globe in the position of our north pole (Chicago), stretch the string directly along the surface of the globe from Chicago to Hobart, Tasmania, and at that point on the string, secure the point of a lead pencil. This distance, remember, is 8,400 nautical miles.

Now, with the string centered at Chicago, swing the pencil around the globe, being careful always to keep the string straight between the pin and the point of the pencil. In this way, a circle will be drawn around the globe with Chicago as the center. Every point within this area so drawn will be at a distance not greater

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WGN REACHES OUT TO TASMANIA—A NEW RECORD

Gene McDonald, above, owner of WGN, formerly WJAZ, and John T. McCutcheon, right, famous cartoonist for the Chicago Tribune, greet Radiophans on the eve of making a new world record. The gala program marked the Tribune's affiliation with WGN.

A few of those present at the dedication of WGN, who, it develops, had a possible audience of 98 per cent of the world's total population. Left to right: Gene McDonald, John T. McCutcheon, Rev. Gardner A. MacWhorter, William M. Dewey, Mayor of Chicago Dever and Edith Mason, opera star.
P. & A. Photos

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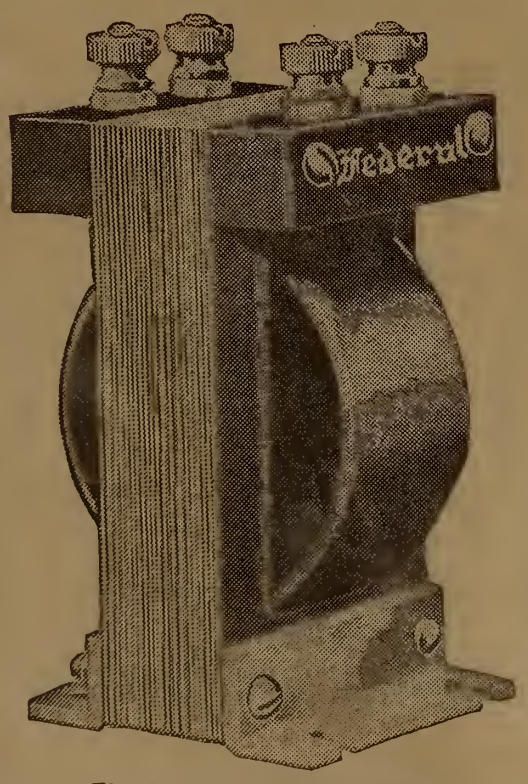

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Federal RADIO

BEFORE THEY THOUGHT OF "MIKES"

The gentleman in the circle at ten months considered life a very serious matter. With added years, his features still resemble the baby picture very much and he is still serious minded. From his station come evening talks and readings he often writes. Who? Wait till next week.

Last week's babe with the skirts on is at the left divulged as S. W. Barnett of WOC. Read more about him below.

Above is the first prize baby at Columbus, O., twenty-nine years ago. Name coming next week.

M. Joseph Sartory, WCAE, above, is the curley-locked lad with the pop gun shown last week. Note he still retains the curly hair. Read more about him below. The nine-months-old babe in the bear skin at the left has a name that rhymes with rainy.

Stanley W. Barnett, WOC

STANLEY W. Barnett managed to slip into this world just two years before the Twentieth century began its notorious career. WOC is the Palmer School of Chiropractic, as you all know, and as it happens, "Stan" is a licensed "back-puncher" as well as a brass-pounder and announcer. The native sons of California would probably put him in jail for being a chiropractor, so that eliminates his ever being announcer for KPO, KFI, KGO, KHJ, KLX, etc. However, he has been forced to put aside his knowledge of back-thumping and devote his time to key-thumping and microphone-massaging for the present.

During the war Mr. Barnett was a first-class Radio operator in the U. S. Navy and became so attached to navy life that one year ago he enlisted for a life cruise on the good ship Matrimony. Husband-hunters need read no further. The married life seems to agree with Stan, for since the above photograph of him in his shirt sleeves was taken he has added about twenty-five pounds weight.

If you happen to notice that his voice is gradually becoming weaker and weaker, it is because he has to stand further and further away from the mike as a result of his increasing girth. B. J. Palmer, father of the Palmer school, is planning to take care of Stan's adding avoirdupois by putting in a couple of extra speech amplifier tubes in the announcer's microphone line.

We forgot to ask Announcer BWS where he was born, but he did say that his parents lived in Kitanning, Pa. And while we mention this another thought enters our mind. Few sons are able to keep so closely in touch with their parents as are the sons who by good fortune are announcers. BWS says that in three years' time he has only been home once, but "that doesn't mean much for me to be away from home, as my folks back in Kittanning hear my voice every night before retiring."

M. Joseph Sartory, WCAE

M. JOSEPH, now the voice of Kaufman & Baer, Pittsburgh, was born on the reverse side of the pond August 2, 1885. He soon developed a distaste for foreign languages and therefore moved to Pittsburgh, where he decided to stay for life, even if he did have to change his collar every day. He admits that he always was fond of outdoor sports of all kinds and stayed away from school whenever possible, although he did have a very distinct "what makes it go?" complex and ruined many good alarm clocks.

Beginning at the tender age of 14, he became a Postal Telegraph messenger and soon thereafter was promoted to Morse "speed maniac." In the latter capacity of brass pounding Mr. Sartory was known as "The Kid" as a result of his extreme youth. Morris Stephens taught "The Kid" vocal lessons as a result of his interest in choral singing. He has sung for many of the larger Pittsburgh churches.

Mr. Sartory was trying to answer "what makes it go?" by snooping around WCAE one day, when Chief Operator Thomas McLean "discovered" him. M. Joseph says he never will forget the first awe inspired in him by the thoughts that went chasing through his mind the first time he substituted for the regular announcer.

He emphasizes that he is impressed by the simplicity of really great men, such as he has met in the studio, and their unquestioning compliance with the instructions or directions given them on their first appearance before a microphone. According to his creed, he believes that the announcer is just a necessary evil to the BCL, and that his duty to them consists first, in placing the artists to the best possible advantage before the microphone, balancing out volumes of sound so that they blend evenly; second, making all announcements clearly and concisely, not too fast, so that there is no question as to what station is being heard; third, making himself as inconspicuous as possible, and permitting the credit for a performance to fall where it is justly due, to the artist who is performing.

FREE AIR ISSUE HAS HOOVER'S APPROVAL

DEPT. OF COMMERCE NOT AGAINST BILL

Senator Howell's Plan, However, Secretary Says, Does Not Go Far Enough

WASHINGTON, D. C.—The Department of Commerce is not opposed to the free ether bill favorably reported to the Senate as introduced by Senator Howell, according to Secretary of Commerce Hoover.

Secretary Hoover states that while the department is not opposed to the bill, he does not feel that it goes far enough. Mr. Hoover pointed out that the two-year license period allowed by the Howell bill would not interfere in any way with the department inasmuch as at the present time the department is only issuing licenses for a comparatively short time.

Representative Rayburn, of Texas, has introduced a free ether bill in the House of Representatives. The bill is identical with the bill introduced and reported out by Senator Howell in the Upper House.

Senate Against Special Privilege

The Senate committee on interstate commerce in favorably reporting out the Howell bill, points out that "the ether and its use within the jurisdiction of the United States may be well considered one of the great and almost untouched natural resources of the nation."

"No one can prophesy," continues the report "the future of its use. Its possibilities undoubtedly transcend any dreams of today not merely in the matter of the transmission of signals, speech, and pictures (including the printed pages), but also of the transmission of energy for the development of power.

"Under the circumstances, therefore, it would be unthinkable for Congress, through any laches on its part, to encourage any person or interest to assume the possibility of securing a right to any use of the ether whatever, other than a mere privilege for a limited period of time."

Lays Batavia Woes to Short Circuits

North Carolina Man Offers Solution to Troubles; $50 Reward Offered

CHICAGO.—As an answer to the Batavia, N. Y., Radiophans who are offering $50 to the person or persons who discover and eliminate the mysterious electrical disturbance in Batavia, comes a letter from J. A. Turner, Winnsboro, S. C., who says the trouble may undoubtedly be traced to short-circuited transformers in electric power lines. He says:

"You will no doubt find that a high voltage wire is rubbing against the shell of one of the transformers, thereby causing a high frequency current to flow from the transformer over the entire system of the city, or that there is a short-circuit within the transformer which would produce the same effect.

"To locate the trouble, I suggest that a one stage Radio frequency receiver with a loop aerial be hooked up and placed in an automobile. The lines should be followed until the disturbance noise reaches its maximum. At this point a faulty transformer or short-circuit will very likely be found."

LISTENING SETS FOR VETERANS' HOSPITALS

Wiring for Every Sanitarium Being Prepared

WASHINGTON.—The Veterans' Bureau here plans to equip all government hospitals with Radio as soon as possible. As a preliminary step the wiring for Radio of hospitals under construction has been authorized.

All 48 hospitals at present occupied, not yet supplied with Radio, will also be wired and equipped as soon as means to meet the expenses can be found. Money will be needed for the centrally located receiving sets, and headsets and loud speakers. It is hoped charitable institutions or Radio manufacturers will aid the government in its plan.

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4-19-24

OLD TIME MELODIES OUST JAZZ AT KFNF

SHENANDOAH, IA., HAS A 9 O'CLOCK STATION

Fiddlers' Trio, Farmers' Cornet Band, Virginia Reels and Pig Mascot Featured

SHENANDOAH, IA.—Laughing saxophones, weirdly whining reeds and woodwinds, grotesque tympany—epitome of Jazz.

The whirr of a generator, a brief announcement and a clash of cymbals—opening of any program.

Twist of the detector dial, a subdued siren and a blare of modern melody—on any DX set.

But tarry, should the operator catch the wave length of Station KFNF, the broadcasting organ of the Henry Field Seed company at Shenandoah, Ia., he could easily imagine that he had been transported back through time and space to the "good old days."

Specializing in Old-Fashioned Music

Like as not, the "Fiddlers' Trio" of Shenandoah would be stamping their boots in rythym with the square dance or Virginia reel they were playing. Or mayhap the Page County Farmers' Silver Cornet band, 35 pieces, would be tuning up to play. KFNF is specializing in old-fashioned music.

But the operator must tune in before 9 p. m., Central time. There is no broadcasting after that hour in Shenandoah.

"We are all hard-working folk hereabout," announces Henry Fields, who operates the seed house and the station, "and we are very busy about ten hours a day. The Radio work must be done in off time."

What KFNF Won't Broadcast

Barred from the Shenandoah programs are:

Jazz
Elocution
Heavy classical music
Child prodigies
Heavy speeches
Overuse of dedications

Mr. Field personally reserves the right to "pull the plug" on any speaker who talks too long or gets mean or tiresome.

KFNF'S OWNER AND A POSSIBLE SQUEAL

Henry Fields, Shenandoah, Ia., seed merchant, with the mascot of his station, KFNF. "Penelope" (the pig) may put some new squeals on the air.

His broadcasting schedule is:

General concerts: Wednesdays and Saturdays, 7:30 to 9 p. m.; Sacred song service: Sundays at 6:30 to 7:30 p. m.; Ladies' hour: 3 to 3:40 p. m. daily.

Penelope, a pig, is the mascot of KFNF. Mr. Field is striving to educate Penelope so that she will be able to give a flourishing sign-off call. The Shenandoah shoat was adopted as a rival to the WLAG rooster of Minneapolis. The rooster sometimes crows at the conclusion of programs.

Winnipeg Rebroadcasts Kansas City's Program

Canadian Crystal Set Users Benefit by Experiment

WINNIPEG, MAN.—For the second time, the Manitoba Telephone system's station here has rebroadcast an American station. During a recent program CKY picked up WDAF, Kansas City Star, and put it on the air for the benefit of local crystal set users. WDAF played a piano selection, followed by the announcement of some basketball results. CKY immediately "came back" with a piano solo by Digby Tomlinson, the Blind Pianist, followed by the results of a local hockey game.

Tube set users reported that there appeared to be no quality lost in the reproduction. Enthusiastic letters have since been pouring in from crystal set fans. CKY is now able to rebroadcast whenever local receiving conditions are good.

CHATHAM PICKS UP SFR, EIFFEL TOWER

EASTERN FAN FIRST IN U. S. TO HEAR PARIS PHONE

Listens to 1780 Meter Station for One Hour with Four-Tube Receiver

CHATHAM, MASS.—The first Radio concert to be heard in America and transmitted from the Eiffel Tower, Paris, France, was intercepted recently by Bert Moulton, this city. Mr. Moulton is employed as a Radio operator here, besides operating his own experimental station.

The powerful station on the Eiffel Tower, with the call letters SFR, operated by the Compagnie Francaise De Radiophone, used a wavelength of 1780 meters, and broadcast a special program intended for American listeners between 5:00 p. m. and 7:00 p. m., Eastern time.

A carefully callbrated receiver employing four tubes was used, and Moulton listened to the French broadcast program for over an hour. He heard instrumental and vocal selections at 6:10 p. m., and held them until 7:15.

It was the first time regular concert from France was received in America. Station SFR used 2000 watts, twice as much power as the larger American broadcasters use.

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How to Make a Loop Aerial De Luxe

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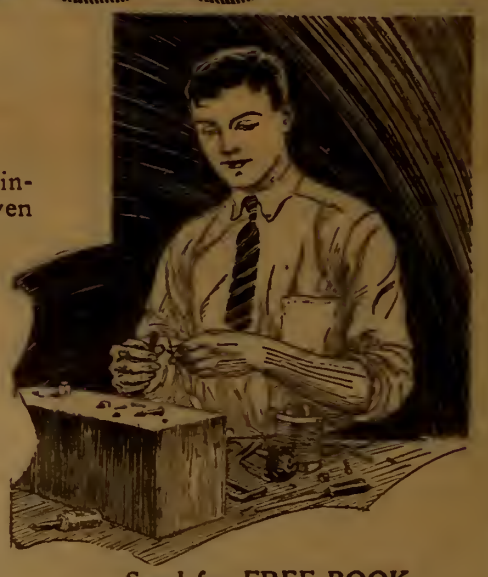
You can! Hundreds of ambitious men are already earning thousands of dollars in this wonderful new industry—many working only in their spare time. Mail coupon below for Free Book which describes fully the amazing money making opportunities in Radio and tells how YOU can earn from $500 to over $10,000 a year!



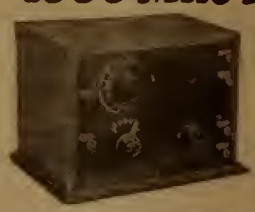
The astounding growth of Radio has created thousands of big money opportunities. Millions of dollars were spent during the past year on Radio—and thousands of young men are needed right now to meet the ever increasing demand of work. Never before has there existed so many and such remarkable opportunities for making money in this wonderful new field.

Men are needed to build, sell and install radio sets—to design, test, repair—as radio engineers and executives—as operators at land stations and on ships traveling the world over—as operators at the hundreds of broadcasting stations. And these are just a few of the wonderful opportunities!

lineman to Radio Engineer, increasing his salary 100% even while taking our course! Emmett Welch, right after finishing his training, started earning $300 a month and expenses. Another graduate is now an operator of a broadcasting station, PWX of Havana, Cuba, and earns $250 a month.

Still another graduate, only 16 years old, is averaging $70 a week in a radio store.

1000 Mile Radio Set FREE



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Easy to Learn Radio At Home In Spare Time

No matter if you know nothing about Radio now, you can quickly become a radio expert, by our marvelous new method of practical instruction—instruction which includes all the material for building the latest up-to-date radio apparatus.

Scores of young men who have taken our course are already earning from $75 to over $200 a week. Merle Wetzel of Chicago Heights, Ill., advanced from

Wonderful Opportunities

Hardly a week goes by without our receiving urgent calls for our graduates. "We need the services of a competent Radio Engineer"—"We want men with executive ability in addition to radio knowledge to become our local managers"—"We require the services of several resident demonstrators"—these are just a few small indications of the great variety of opportunities open to our graduates.

Take advantage of our practical training and the unusual conditions in Radio to step into a big paying position in this wonderful new field. Radio offers you more money than you probably ever dreamed possible—fascinating easy work—a chance to travel and see the world if you care to or to take any one of the many radio positions all around you at home. And Radio offers you a glorious future!

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Learn more about this tremendous new field and its remarkable opportunities. Learn how you can quickly become a radio expert and make big money in Radio. Find out what remarkable successes our graduates have had—even a few weeks after their training finished.

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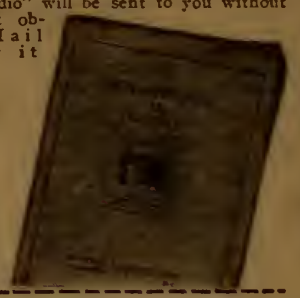

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CONCERT PICKED UP ON NITROGEN TUBE

PROFESSORS MAKE DIODE OSCILLATE AND RECTIFY

University of Pennsylvania Technicians Use Neither Aerial Nor Ground in Unusual Experiment

PHILADELPHIA.—One of the most novel receptions of a concert ever staged in the history of Radio was successfully accomplished recently by two professors at the University of Pennsylvania, recently while conducting experiments to determine the construction of nitrogen molecules.

The experiment was made by Dr. E. Witmer under the direction of Dr. Charles B. Bazzoni. They were using a specially designed two-element nitrogen-filled tube to study the spectrum of the blue light emitted by the tube, made incandescent by passing through it a current of electricity.

No Aerial or Ground Used

The most remarkable thing about the reception with the nitrogen tube is that no special apparatus of any kind was used to tune in a station, the nitrogen tube and its circuits acting as a rectifier. No aerial or ground was employed. The long leads inclosed in a conduit and coming underground from a storage battery in the adjoining building, served as a loop antenna, and also supplied the necessary inductance.

Although the tube contains only two elements, it was made to oscillate. The headphones were connected to the secondary of a transformer and the pulsating direct current set up in the secondary acted on the diaphragms of the phones and produced sounds.

Bureau of Standards Keeps Wavemeters Over Wide Band

WASHINGTON.—Two specially constructed wavemeters, covering the frequencies in more general use, (16,650 to 65 meters), are kept at the bureau of standards here. The standard wavemeters are used in calibrating wavemeters belonging to the Radio inspection service, manufacturers, colleges or others in need of standard wavelength, in Radio measurements and In adjusting the bureau transmitting set, WWV, which is used to transmit standard wave signals.

A VOICE FROM ROOSTER HEAVEN

Joe Maland is shown before the microphone of Station WLAG, Minneapolis-St. Paul, with his pet (stuffed) rooster, Billy Lag, signing off at the close of the Northwest Farmstead program.

IT IS rumored rather widely that Station WLAG, Twin City Radio Central, Minneapolis, has a pet rooster, a real one by the name of "Billy Lag," who signs off every evening at 8:15 p. m., Central time, closing the Northwest Farmstead program for WLAG. It is rumored—but we doubt it. For the crow of Billy Lag, despite the above photograph, has a very peculiar resemblance to the war whoop of one Joe Maland, said to be the trainer of Billy. But if Billy was trained, it was Joe's voice that received the training.

And thereby the whole plot is exposed. A terrible plot it was, too, embracing the whole country in its talons. Why, WLAG even had the above photograph of Mr. Maland at the microphone taken, and then pasted in a photo of Billy Lag. After the pasting operation, the photographer's art was again employed to take a picture of the "doctored" photograph. Then the photograph was sent to every friend of WLAG, quite an order of photos, together with the beautiful explanation of how Joe Maland tickles the reported Billy to get a sign-off crow.

But the editor wasn't sold on the idea. Billy is nothing more than a dead, stuffed bird, whose museum specimen number still remains on his left leg. His glass eyes also give him away. So Billy Lag's crow will continue to be a ghostly cackle from rooster heaven . . . until WLAG sends us Billy himself or motion pictures of Billy in action.

PLAN TO BROADCAST G. O. P. CONVENTION

WJAX, CLEVELAND, LIKELY TO BE PLANT USED

Part of Proceedings at Republican Parley to Be Barred from Ether

WASHINGTON, D. C.—Elaborate preparations are being made for the broadcasting of the Republican National convention proceedings at Cleveland. Details, however, are not yet available. It is understood that a meeting of the committee in charge will be held the latter part of April in Cleveland at which time definite details will be available.

It is understood that it has been tentatively decided to install loud speakers all over the hall at Cleveland and in addition on the outside of the convention hall so that thousands of people who will not be able to gain admittance to the convention proper will be able to hear details from the streets adjoining the hall.

Certain parts of the proceedings will be broadcast and it is probable that Station WJAX, the Union Trust company, will be used. At the present time it is believed that only a certain part of the proceedings will be broadcast. It is not thought feasible to broadcast the entire convention.

WBZ Man Gets Loud Speaker

SPRINGFIELD, MASS.—Arthur A. Eisemann, program director of Station WBZ here, was recently secretly married to Lois E. Gedelman of Youngstown, O. A combination brass and funeral band greeted him on his return, news of the wedding having arrived first.

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—Confucius

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THE man who has once operated a Grebe Receiver reaches instinctively for the Tangent Wheel Verniers on every other receiver he thereafter tunes.

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Exclusive ability of Erla audio transformers to amplify three stages without distortion assures improvement in any receiving set. List, $5

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Only the most flawless reproduction, free from distortion and parasitic noises, could earn a tribute so unreserved from America's queen of song.

The exquisite tone quality and purity of Duo-Reflex reception that appealed so irresistibly to Miss Garden is finding equally enthusiastic appreciation in the homes of super-critical radio lovers everywhere.

Not only in sheer tonal perfection, but in range and volume, have Erla Duo-Reflex receivers demonstrated decisive superiority. Tube for tube, they are the most powerful receivers known.

Complete Erla parts, including celebrated synchronizing radio and audio transformers that enable vacuum tubes to do triple duty, guarantee success to the amateur who "rolls his own." Easily understood blueprints guide every step of construction and assembly.

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ERLA

MORE THAN BILLION PEOPLE WGN REACH

WORLD'S POPULATION, MINUS 2%, MIGHT HEAR

Capt. W. Evans, USN, Gives Idea of Significance of Chicago Stations New World-Record

(Continued from page 4)

than 8,400 miles from Chicago, or from our so-called north pole.

By this we will divide the earth into two unequal parts, the larger part representing the area that is within 8,400 miles from Chicago (the distance reached by the voice on this test).

Finding Unreached Area of Earth

Another and simple way to get this circle is to take a string or a pair of ordinary dividers, and, with our south pole (latitude 42° south, longitude 92° east), and a length of string, or dividers equal to 2,400 miles—or 40° in the earth's arc—draw on the surface of the globe a circle with our south pole as the center. If carefully done, this circle will exactly coincide with the circle as drawn above, with Chicago as the center.

This smaller area will be the area within which all points are at a greater distance than 8,400 miles from Chicago, and it represents the area within which the voice on this test did not reach.

Area Covered Will Surprise

Now, by an examination of the two areas, it will be found that, in the large area, i. e., the area in which no point is over 8,400 miles from Chicago, there are included the entire continents of Europe, Asia, Africa, North America, South America, all of the Pacific Islands, also the north and south poles of the earth. Whereas in the smaller area, there are included only the western portion of Australia and Tasmania, the southern portion of the Sumatra group, and a few islands in the Indian Ocean. These latter islands have but a very small population.

This demonstration will probably be a surprise to most readers, as it was to me.

Why 98 Per Cent of World Couldn't Hear

It means that when the voice over a microphone at Chicago will carry 8,400 nautical miles, that it is reaching nearly the entire population of the earth (98 per cent).

Owing to the fact, however, that the Radio does not carry in daylight as it does in darkness, the voice at one time could not reach the whole inhabited part of the earth, but by speaking in the morning about daylight, as was done in this recent test, it would reach one-half of the earth to the westward; and then, by speaking just at dark in the evening, it would reach the other half of the earth to the eastward; nearly the whole area of the earth, however, being reached from one position.

Receiving and sending instruments are continually being improved and it is, of course, a matter of only a very short time when the additional 2,400 miles noted above will be reached. When that is accomplished it will be possible for the voice to carry over the whole of the sphere. But, as stated before, with the 8,400 miles that has been reached, we reach almost the entire part of the earth that is inhabited.

Aerial Regulatory Law in Use in Washington

Prohibits Towers on Public Ground; Fixes Heights

WASHINGTON, D. C.—The first Radio regulatory law has just been made effective by the commissioners of the District of Columbia. The regulations prohibit the erection of aerials on any public property and they also prescribe certain heights.

It is said that at a recent fire when the firemen went on the roof of an apartment house they were confronted with twenty-four aerials which had to be cut before they could work on the fire. The new regulations are to prevent such instances.

WHEELING, W. VA.—The city council has passed unanimously the city's first ordinance regulating erection of Radio aerials. The ordinance requires a city permit before a resident may install a set.

The new regulations say antenna shall not cross over or under electric light or power wires carrying 500 or more volts and all possibility of contact must be avoided. The ordinance is purely for the insurance of proper installations and contains very rigid specifications of how installations shall be made. Fines up to $100 or a year in jail may be placed against persons violating the ordinance.

RADIO TALKS

The use of a low resistance condenser or a low resistance tuner will so sharpen your tuning and increase your selectivity and distance ability as to make their selection a matter of vital importance.

Genuine BUELL— E. J. Flewelling Radio Apparatus De Luxe

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

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No outside Spring Connections—True Capacities.

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11 plate plain	$2.00	16 plate vernier	$4.00
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OFFICIAL OF LARGE CORPORATION EXPLAINS

E. E. Bucher Says Incorrect Guesses at Demand Is Root of Trouble —Okeh Now

NEW YORK.—When asked whether there was any foundation to the rumors that the company which he represents had withheld the sale of vacuum tubes and thus restrained the sale of competitive apparatus, E. E. Bucher, manager of sales, Radio Corporation of America, said:

"Rumors to the effect that we have been holding back on our tube sales are absolutely unfounded, and I wish to deny that this is the case.

"Only ten to fifteen per cent of our total monthly tube production is required for our merchandise, the remainder going to purchasers using sets and parts manufactured by others.

"There are general facts in the vacuum tube situation which we are glad to give and which, no doubt, will tend to curb any feeling that the Radio Corporation of America is not giving this subject the close attention that it deserves.

Presents Facts of Case

"We maintained a day-by-day inventory of from 450,000 to 600,000 tubes of five different types, up to January 1st of this year, and steps were taken many weeks past with the endeavor to build this inventory to still larger figures.

"768,816 Radiotrons were delivered to the trade in January, this year; 825,936 in February, and March deliveries will exceed 900,000.

"70 per cent of our monthly production schedule is composed of Radiotrons UV-200 and 201-A.

"Stocks of dry battery tubes have been in excess of the trade demands from May, 1923, to date and current production is keeping apace of the demand.

Believes Excess Will Come Soon

"Current production on the storage battery types of tubes is actually in excess of new orders booked for these particular types, but present production schedules should produce an excess soon.

"Briefly, the industry is too young to enable either the dealer or the distributor to place orders with the manufacturer sufficiently in advance to meet the fluctuating demands for the specific types of tubes. As the factories, on the other hand, must prepare their production and procure new material from ninety to 120 days in advance of actual deliveries, it becomes necessary for us to endeavor to predict at least four months in advance what the trade requirements may possibly be. To this end the Radio Corporation maintains a staff of expert statisticians whose time and energies are devoted solely to a study of this situation, frequent conferences are held with the manufacturers and production schedules are revamped to meet the fluctuating demands of the market.

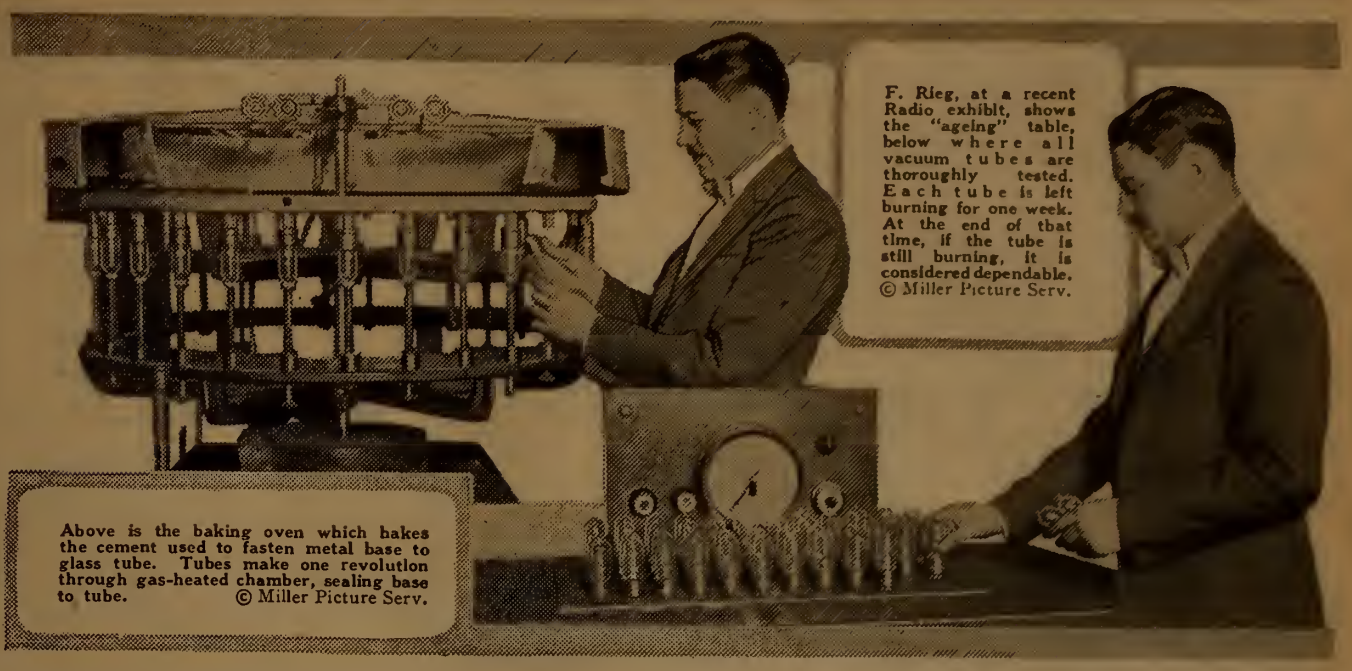
May Be Locality Shortages

"A temporary tube shortage may develop in any particular locality not by reason of insuffcient factory production, but because of the difficulties of obtaining uniform distribution. The Radio Corporation sells its tubes to distributors; from that point on it has no control over distribution to the dealers. We are aware, however, that distributors are making every effort to serve dealers in all localities, but the actual quantities distributed in any particular territory are also governed by the amount of dealers' orders, dealers' credits, inability of some dealers to sense the public demand sufficiently in advance to enable them to serve customers promptly, and numerous other factors, all of which have bearing on the situation.

"As further evidence of our desire to meet all possible trade demands, it is important to point out that only ten to fifteen per cent of our total tube production is required for our own merchandise and all that we need is more concise advance notification of what the trade wants, thus enabling us to prevent shortages."

Islands of the southern Pacific Ocean have been brought within regular range of American broadcasting. KGO, the new 1000-watt station of the General Electric Company at Oakland, Calif., was heard two evenings out of five at Apia, British Samoa, a distance of 4,750 miles from Oakland.

"HOWDJA" LIKE TO OWN A VACUUM TUBE MACHINE?



F. Rieg, at a recent Radio exhibit, shows the "ageing" table, below where all vacuum tubes are thoroughly tested. Each tube is left burning for one week. At the end of that time, if the tube is still burning, it is considered dependable. © Miller Picture Serv.

Above is the baking oven which bakes the cement used to fasten metal base to glass tube. Tubes make one revolution through gas-heated chamber, sealing base to tube. © Miller Picture Serv.

Weather Service Day and Night for South

Station WEAY In Houston Does Something New

HOUSTON, TEX.—For the first time in history, the South has a weather service that always stays open. Bulletins are available both day and night for farmers, plantations, lumber camps, ships on the gulf, summer resorts and towns alike.

Arrangements have just been completed by the weather bureau through Lawrence H. Daingerfield, forecaster at Houston, to broadcast weather every night from WEAY (360 meters) between 10:05 and 10:10 p. m. Central time.

The plant of WEAY is at the Iris theater in Houston, where WFO, a commercial Radio station is also maintained.

De Forest DV3 Dry Cell Tube $6.50

De Forest DV2 Storage Battery Tube $6.50

The More You Know About Radio The More You Rely on De Forest

Without Lee De Forest's discovery of the vacuum tube there would be no radio today. All radio broadcasting, all radio receiving by means of tube sets, rests on De Forest patents.

De Forest has been a pioneer in radio since 1900 and De Forest is a pioneer today. That is the reason for the great success of the De Forest Reflex Radiophone. That is the reason for the success of the new De Forest tubes—DV-2 Storage Battery Tube, DV-3 Dry Cell Tube.

If you want a radio receiving set with a range on indoor loop of from 1,500 to 3,000 miles, depending on atmospheric conditions; if you want simplicity of control, clear reception without distortion and without extraneous noise; if you want operation on either wet or dry cells—see the De Forest Reflex Radiophones at the De Forest agents today.

The D-7 A Reflex Radiophone is a three-tube set at $125.00; the D-10 Reflex Radiophone has a drawer in its cabinet for dry batteries and is a four-tube set at $150.00. No matter what you pay, you can't get greater radio satisfaction.

Whether you buy your set complete, or build your own from the laboratory-tested De Forest parts, you can rely on De Forest, the greatest name in Radio.

DeForest Radio Tel. & Tel. Co.

Dept. R. D. 8 Jersey City, N. J.

De Forest Portable Reflex Radiophone type D-10, which operates on wet or dry cells, has a reception range of from 1,500 to 3,000 miles on indoor loop; has drawer for all necessary A and B dry cells. Price $150.00, plus approximately 6% for transportation in territories west of Rocky Mountains.

DE FOREST

Radio Catalogs Free
Send a postcard for De Forest's Free Radio Catalog with full details and prices on sets, tubes, and parts.

De Forest products are sold only through exclusive agents direct to the public for your protection. The De Forest Company will be glad to hear from representative dealers in various communities who wish to become exclusive De Forest agents.

BRISTOL SINGLE CONTROL RADIO RECEIVER

Most Simple to Operate
The set for those who want results with little effort. Anyone in the family can quickly learn to operate it because technicalities and guesswork are eliminated—One Control Dial does it all.

Does Not Interfere With Your Neighbor
Other close by reception is not disturbed when you tune in with this non-reradiating Receiving Set. It gives you a comfortable sensation of freedom to be able to change from one station to another knowing that you will not interfere with your neighbor's receiving.

Choice of Aerial or Loop
Where conditions make it difficult to install an outside aerial, as in congested sections of cities, good results can usually be had by using inside Loop. In fact, the directional feature of the Loop often brings in stations not possible with a stationary aerial.

Mounted in solid mahogany case with walnut finish, the Bristol Single Control Radio Receiver is handsome in appearance. The price is $190.00. Bulletin AY-3013 describing this set will be mailed on request.

BRISTOL
TRADE MARK
AUDIOPHONE
REG. U. S. PAT. OFFICE

Loud Speaker

This is known everywhere as the Loud Speaker with the quality tone. Not only is the tone natural and without mechanical distortion, but is sufficiently big in volume to be easily heard in a large room or all through the house. Comes to you ready to use—no auxiliary batteries are required.

Made in three models:

Audiophone Senior .....Price,	$30.00
Audiophone Junior.....Price,	22.50
Baby Audiophone .....Price,	12.50

THE BRISTOL COMPANY, Waterbury, Conn.

OVERWHELMED!

ORDERS! Orders!! Orders!!! Thousands since last week's Radio Digest advertisement snowed us under. If you have already sent your order for this amazing bargain, your DeLuxe Neutrodyne is now on its way to you. This week, with enlarged facilities, the second rush will find us ready for every order on this sensational set which only America's Greatest Store can offer.

THIS is the set that fans say they build within three hours on our Special Blueprint—that they say is far above comparison with their friends' factory built sets, and logs stations all over the country. More than a hundred fans write in their letters that they cannot understand how we can sell such high quality licensed Neutrodyne parts at such a low price.

The DeLuxe Neutrodyne

ANOTHER RADIO SHACK SENSATION

The Deluxe Neutrodyne

ALL Parts LICENSED
ALL Parts MATCHED
Fine Workmanship

GENUINE HAZELTINE

INDEPENDENT RADIO MANUFACTURERS INC. LICENSED BY NEUTRODYNE UNDER HAZELTINE PATENT NO. 1450080 OTHER PATENTS PENDING REG. U.S. PAT. OFF.

5 TUBE NEUTRODYNE Knock-Down Set COMPLETE

$34.49

SEND NO MONEY

Written Money-Back Guarantee Sent With Each Purchase

Read This List of PARTS

Just Picture This—

1 DRILLED Radion Mahoganite Panel, engraved in gold.
3 Four-inch Radion Mahoganite Dials, gold engraved.
2 Gold Plated Jacks.
3 Genuine Hazeltine Neutroformers Mounted on the famous Comsco Bakelite End Condensers. Positively the only Neutrodyne Kit including these famous Comsco Condensers.
2 Hazeltine Neutrodons.
5 Bakelite Sockets.
1 6-ohm Rheostat with Gold Plated Knob to Match Panel.
1 30-ohm Rheostat with Gold Plated Knob to Match Panel.
2 Genuine Killark Shielded Audio Transformers.
1 Baseboard.
20 Feet Tinned Bus-bar.
1 .00025 Freshman Grid Condenser.
1 Tuhular Glass Grid Leak.
1 Set Engraved Binding Posts.
1 .002 Micon Condenser.
1 .006 Micon Condenser.
Exact size special panel and base blueprint.
All packed in attractive box.

Read What USERS Say—

"I consider yours the best buy I have ever made in Radio." B. A. Steele, Hartford, Conn.

"I am very glad to be dealing with men of such business integrity. I shall recommend your house on all possible occasions, and be glad of the privilege. I have been building sets for two years, and am fairly well up in the game.
Alfred L. Hunt, McCall St., Bennington, Vt.

"Goods arrived this a. m. Your house is no doubt offering the public better service than any other in the country, and if you are not constantly receiving commendations, it is due to the fact that your customers have just neglected to express their appreciation. Please send me prices on cabinets."
V. C. McDonald, 440 State St., Watertown, N. Y.

"A number of people here have purchased from you, and are satisfied with the goods they received. I built up one of your five-tube Neutrodynes last week and it works as good as a $250.00 machine."
Geo. H. A. Parker, Box 123, Abbotsford, Wis.

"I congratulate you on giving the radio fans these wonderful bargains."
A. J. Toll, 742 Nelson St., London, Ont., Can.

"Please send mo another complete set of the Neutrodyne parts the same as you sent me two weeks ago. I am very well satisfied with the set. I have it wired and it works perfect."
Charles F. Stein, 611 No. Center St., Joliet, Ill.

Complete Outfit of Additional Accessories

5 Tested Matched Tubes (201A Type) for Neutrodyne	$19.25
2 45-volt "B" Batteries	6.00
1 "A" 60-ampere Storage Battery	10.95
Phones (3000 Ohms)	3.75
Complete Antenna Equipment	1.50
Cabinet, Piano Finish	4.95
	$46.40

Also Sold Separately

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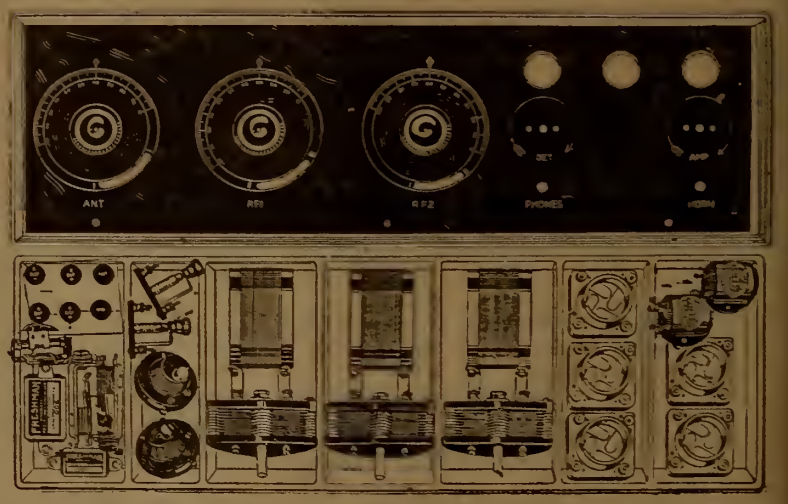
EXECUTIVE OFFICE:
55 Vesey Street, Dept. RD-419
NEW YORK CITY

Goods shipped C.O.D.
Just pay the postman
EVERY ARTICLE SOLD ON WRITTEN MONEY-BACK GUARANTEE

A 5-Tube Assembly Kit Which Includes Everything Necessary to Build a Genuine Hazeltine 5-Tube Set The De Luxe Neutrodyne For Beauty and Efficiency



You Can Build The Most Beautiful Receiver Ever Designed

USE THIS COUPON

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Date .....

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New York City

Ship me C. O. D. The DeLuxe Neutrodyne at $34.49, the complete assembly kit to build a genuine Hazeltine 5-tube set.

☐ Put a cross (X) in this square if you ALSO WANT us to ship you C. O. D. the Outfit of All Additional Accessories at $46.40. Send a separate order if you want only part of this outfit.

Name .....

Address .....

OPERATING AND TROUBLE SHOOTING

For the Owner of a MELCO Supreme Receiver

"OPERATING and Trouble Shooting" is a Radio Digest feature whose purpose is to study the late models of various standard receiving sets and to show the newly initiated broadcast listener, who has purchased such a set, how he can operate it to get the best there is in it and how he can overcome minor difficulties which may be causing some trouble. On pages 17 and 29 this week, the Melco Supreme Receiver is described. Radiophans with other sets will also find these articles worth reading, particularly the notes on trouble finding.

THE Melco Supreme Receiver utilizes the principle of tuned Radio frequency to secure its long distance receiving radius. Details accompanying this method of increasing sensitivity, insure pleasing clearness of tone, absence of howling, distortion and instability of adjustments.

Two terms frequently used in Radio must here be defined—Radio frequency amplification and audio frequency amplification. Radio frequency amplification intensifies the Radio energy as picked up on the antenna and has the effect of moving the receiving set nearer to the broadcasting station. This amplification is effected before the received energy reaches the detector tube. Audio frequency, on the other hand, intensifies the music or speech after they have been detected, and has the effect of moving the telephones closer to the ears. Audio frequency amplification is the intensifying of the sound frequency currents formed by the detector.

Two Stages of Radio Frequency

The receiver has two stages of tuned Radio frequency amplification, a detector and one stage of audio frequency. There are thus three tuned circuits, the first of which is tuned by a novel form of variometer, while the other two circuits are tuned by Radio frequency transformers, known as vario-transformers. These are wound in the form of the letter D and are known as "closed circuit" inductance coils. This cuts out stray magnetic fields which feed energy back from one tuned circuit to another of ordinary tuned Radio frequency amplifiers.

Dial 1 tunes the variometer, while 2 and 3 tune the two vario-transformers. All three of these must be in perfect "synchronism" with the wave being radiated from the broadcasting station before it may be received. This means triple security from interference by another broadcast station whose wave length is as little as three or four meters different from that of the desired station. In other words, the listener may select just what station he desires to hear and hear that particular one without hearing any other station. This does not mean, however, that he may sit down and decide to listen to 2LO of London whenever he wishes to. Such extreme distance work is dependent upon atmospheric conditions to such a degree that no circuit under the sun can honestly be guaranteed to receive such distant stations upon demand.

Types of Antenna

The circuit is moreover of such sensitivity that it is adaptable for reception with any one of the four ordinary types of antenna: Outdoor antenna, indoor antenna, loop and the lighting plug.

Which of these is most successful depends mainly upon the location and conditions varying with the location. The outdoor antenna will give the loudest signals from weak distant stations unless interference is experienced. In that case the loop should be employed. Note: Detach jumper between binding posts marked "gnd" and "loop." In many localities a good lighting plug inserted in a convenient electric light socket operates very satisfactory on both local and distance reception. For an outdoor antenna we recommend a single straight length of stranded copper or phosphor bronze wire about 1/16-inch in diameter and 60 or 70 feet long. This must be well insulated at each end by good porcelain insulators and should be as high as possible above nearby chimneys, wires of any kind, and roofs. It may be suspended from the window to any desirable point of support. If the point of support is more than 75 feet away, another length of wire may be used to bridge the gap, and should be separated from the antenna itself by an insulator.

Ground Wire

The ground wire from the set should be of the same material as the antenna and should run from the ground binding post of the set to the nearest water pipe or radiator. There it should be fastened by a good ground clamp, the latter tightened about a bright, cleanly sandpapered point on the pipe. An approved type of lightning arrester should be bridged between antenna and ground where the lead-in enters the house, and a porcelain tube about 6 or 8 inches in length is used to introduce the lead-in through the window frame. The tubing may be inserted through a hole in a narrow board upon which the window sash may be closed.

For an indoor antenna, we suggest a length of wire about 12 to 20 feet long, fastened to the antenna post and strung to any convenient support.

B Batteries

B batteries of 45 to 90 volts may be used, the higher voltage giving the louder signal. While good dry cells will function as the A battery, quieter and more economical operation is furnished by a storage battery. Connections to the

(Continued on page 29)

BUILD YOUR OWN

5 TUBE NEUTRODYNE SET

WITH LICENSED **Hazeltine Parts**

$39.95 COMPLETE

EACH KIT INCLUDES

Drilled and Engraved 7x26 Panel	$ 8.00	1 Mica Condenser .006	.75
3 Genuine FADA Neutroformers and Condensers	22.50	1 Frost Battery Switch	.30
2 Genuine FADA Neutrodons	2.50	1 Stained Baseboard	1.00
3 4-inch Dials	3.60	8 Engraved Binding Posts	1.00
20 Feet Tin Copper Bus Bar Wire	.25	2 Lengths Black Varnished Tubing	.30
1 Detector Rheostat	1.25	Complete FADA Instruction Book and Blue Prints	.50
1 Amplifier Rheostat	1.50		
2 Genuine Dietzen Audio Frequency Transformers	12.00		
5 Vacuum Tube Sockets	5.00		
2 Frost Neutrodyne Jacks	1.80		
1 Freshman Grid Leak and Mica Condenser	.65		
1 Dubilier Micadon .001	.40		

Regular Price $62.25

Our Price $39.95

NEUTRODYNE has taken the country by storm. It is the remarkable distance getting, powerful, non-oscillating and non-whistling receiver.

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Standard Merchandise Only

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Anything and Everything in Radio

NEW COCKADAY DISTORTIONLESS AMPLIFIER

Complete Parts Exactly as Specified by Mr. Cockaday

List Price		Our Price	List Price		Our Price
$4.00	4 Na-Ald Sockets	$2.60	$12.50	1 Pr. Como Dup. P. P.	$10.00
2.00	2 Marco Jacks	1.50	7.00	1 Amertran, 5 to 1	5.60
2.50	2 Amsco 20 ohm Rheostats	2.00	3.90	6 N. Y. Coil, .005 Cond.	3.30
2.00	1 Bradleyohm No. 25	1.80	2.00	10 Eby Binding Posts	1.80
1.85	1 Bradleyleak	1.70	2.25	1 Panel 7x12	1.95

List Price $40. OUR PRICE for above complete parts **$32.00**

The Above Parts May Be Bought Separately

$120 FADA NEUTRODYNE Set No. 160-1 Wired in Fada's Own Factory None shipped C.O.D. **$94.50**

$65.60 FADA KNOCKDOWN Parts No. 167-A Sealed in Fada's Factory Complete parts..... None Shipped C.O.D. **$49.95**

8 TUBE Super-Heterodyne Type SH 8-1 Receptrad Kit Consisting of
3 R.F. Trans., 5,000 to 25,000 meters, Type R.F. 1716
1 Audio Trans. for 1st stage, Type ATX
1 Audio Trans. for 2nd stage, Type AT3
2 1 Mfd. By-pass Condensers, Type C 1000
1 Tuned Filter Coupler, Type SW 21
1 Super-Heterodyne Manual
ADDITIONAL PARTS
1 Panel 7x8x36 Bakelite, drilled and engraved
1 Terminal Panel 7x8½x1½
1 .001 Mfd. Cardwell Univernier Condenser
1 .0005 Mfd. 23 plate Cardwell Vernier
8 Sockets, Federal or General Radio
3 Rheostats, 10 ohm, Gen'l Radio
2 Rheostats, 6 ohm, Gen'l Radio
1 Potentiometer, over 400 ohms, General Radio
3 Grid Condensers and Leaks
2 .00025 Fixed Dubilier Cond.
1 .002 Fixed Dubilier Condenser
1 .006 Fixed Dubilier Condenser
1 2 Circuit Federal Jack
1 Single Federal Jack
1 Switch, Cutler-Hammer
List Price $125.00. Our Price **$92.50**

COMPLETE PARTS FOR Neutrodyne 5-Tube Set
1 7x26 Panel, Drilled
2 Single Sockets
1 Triple Socket
2 Neutrodons
3 Neutroformers
2 Jefferson Transformers
1 Battery Switch
3 4" Dials, Fada Type
1 Power Rheostat
1 Vernier Rheostat
8 Binding Posts
1 Closed Circuit Jack
1 Filament Control Jack
27 Ft. Insulated Tubing
27 Ft. Tinned Bus Bar
2 Fixed Condensers, .006 Mfd.
1 Fixed Condenser, .00025 Mfd.
1 Grid Leak, 2 Megohms
1 Diagram for Above Set
Our Price **$31.50**

5-Tube Neutrodyne Set, wired complete in a mahogany cabinet—Genuine FADA Parts. **$79.75**

COCKADAY 4 CIRCUIT TUNER
Complete parts for the Improved Cockaday 4 Circuit Tuner, exactly as specified by Mr. Cockaday **$55.00**

4000 Ohms N&K Imported Phones MODEL D List $8.50 **$5.85**

$80 *Freed-Eisemann* $150

Parts for 5 TUBE NEUTRODYNE Set K.D. 50 None Shipped C. O. D. **$64.50**

NEUTRODYNE Model N.R.-5 None Shipped C. O. D. **$124.00**

PHONES		TRANSFORMERS		DIALS AND SOCKETS	
$ 5.00 Turney, 3000 ohms	$ 2.75	7.00 Federal No. 65	5.35	3" Amsco Bakelite	.45
12.00 Western Electric	8.75	5.00 Acme	3.85	4" Amsco Bakelite	.80
6.00 Brandes Superior	4.70	5.00 All-American	3.85	Bell Socket	.65
12.00 Baldwin Type C	7.95	7.00 Amertran	5.00	Melco Socket	.80
7.00 Federal	4.85	4.50 Thordarson	3.75	Bakelite Socket	.45
5.50 Stromberg Carlson	4.50	12.50 Como Duplex P. P.	10.00	Chelton Socket	.65
12.00 Dr. Selbt 6000 ohms	5.75	12.50 Modern Push-Pull	10.00	MISCELLANEOUS	
LOUD SPEAKERS		5.00 Erla	4.25	Pathé Phusiformers	7.95
$30.00 Music Master	$24.00	12.00 All-American P. P.	10.00	Ambassador Coils	5.25
35.00 Magnavox	29.00	4.00 Duratran R. F.	3.35	Cockaday Coils, Precision	4.50
36.00 Radiola F. H.	30.00	5.00 General Radio	4.35	Cockaday Coils, Faster	3.35
10.00 Brandes Table Talker	6.50	POTENTIOMETERS		AMPLEX GRID DENSER	1.10
Baldwin Unit	4.65	1.25 Pacent	1.10	Lavite Resistances, 48,000 ohms, Genuine	1.10
Amer. Radiophone Unit	3.95	1.50 Amsco	1.25	$2.00 Reinartz Coil	1.40
Geraco Music Master Unit	9.00	1.50 Cutler Hammer	1.15	Erla Crystals	.90
		1.50 Klosner	1.25	Brach Lightning Arrestors	1.75

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SUPER-VALUES

Super-Heterodyne
NEW AND IMPROVED TYPE

Resistance Coupled—No Transformers
MODEL "D"

Complete Blue Prints—Consisting of Instrument Layout and Wiring Diagram

Our Number —501—502 "D"

Post Paid **$2.00**

Cockaday Four Circuit Receiver

Cost of Parts at List Price. . $73.30
Cost of Parts at Our Price. . $59.00

Receiving Range:—Over 3,400 Miles

Mr. Cockaday needs no introduction to the radio fans of America. He is known among the amateurs as a source for complete and authoritative information for those who build their own, and we are quite sure that you will make no mistake in building this Master Receiver. You will be compensated for your efforts by many hours of happiness in receiving long distance broadcast reception with this new Receiver, which employs power amplification, automatic tuning, unusual selectivity and a wave length range from 150 to 675 meters.

For the best results it is absolutely necessary that you follow his instructions and wiring diagrams to the letter, and we are prepared to supply you with the complete blueprints, showing the instrument layout, the panel layout and the wiring diagram, as specified in "Popular Radio," for the price of $1.20.

Here Are the Items You Will Need:

SYMBOL	QUANTITY	DESCRIPTION	LIST PRICE
A-B-C-D	1	Four Circuit Coil Set, known as Cockaday Coil	$ 4.75
E and F	2	AMSCO Vernier Variable Condensers, 26 plates .00046 (.0005) MFD. at $4.50 each	9.00
G and H	2	AMPLEX Grid-densers (small Variable Condensers) at $1.25 each	2.50
I	1	BRADLEY-LEAK, Variable ¼ to 10 megs.	1.85
J1, J2, J3, J4, J5	5	MELCO or BAKELITE Tube Sockets, at $1.00 each	5.00
K	1	AMSCO Filament Rheostat, 6 ohms	1.00
L1, L2, L3	3	AMSCO Filament Rheostats, 20 ohms, at $1.00 each	3.00
M1, M2	2	PACENT Double Circuit Jacks, at 85c each	1.70
M3	1	PACENT Single Circuit Jack	.70
N1 and N2	2	AMERTRAN or FEDERAL 65 Audio-Frequency Amplifying Transformers, at $7.00 each	14.00
O	1	COMO Input "Push and Pull" Transformer.	12.50
P	1	COMO Output "Push and Pull" Transformer	12.50
Q and R	2	Switch Levers and Knobs, at 50c each	1.00
S	11	Switch Points, 2 Switch Stops, at 5c each	.55
T	1	Dubilier Mica Fixed Condenser, .0005 Mfd., with lugs for transformer mounting	.45
U	1	Dubilier Mica Fixed Condenser .00025 Mfd., with Clips for Grid Leak	.45
V	1	DURHAM Variable Grid Leak	.75
W1, W2, W3	3	LAVITE Resistances, 48,000 ohms	3.00
X	1	AMSCO Potentiometer, 400 ohms	2.00
Y1, Y2, Y3	3	Composition Panels: 7"x24"x3/16"	3.00
		3"x2½"	.25
		1"x12"	.45
Z	12	Binding Posts	2.40
	30 Ft.	Varnished Tubing	3.00
			$73.30

If drilled and engraved panel is desired, there is a charge of $3.50 extra. One 7x24 Cabinet, Mahogany, $7.50.

In the event you place your order with us, we are prepared to make shipment immediately, as we carry a stock of all of the required parts in large quantities.

Hazeltines-Neutrodyne

Complete parts for building this Master Receiver as below $49.65

1 Bakelite Panel 26x7x3/16 Drilled and Engraved	1 Vernier Rheostat
1 Baseboard	7 Binding Posts
5 Standard Panel Mounting Sockets	1 Closed Circuit Jack
3 Neutroformers	1 3 Spring Automatic Jack
2 Neutrodons	27 Ft. Spaghetti Tubing
2 High Ratio Transformers	27 Ft. Bus Bar
1 A Battery Switch	2 Condensers—.006
3 4" Pathe Dials	1 Grid Leak—2 Megohm
1 Plain Rheostat	1 Grid Leak and Condenser—.00025
	1 Pkg. Screws, Nut, Terminals, Etc.
	1 Fada Instruction Book

Non-Inductive Resistances
THE ORIGINAL P.L.

For Radio Amplification — For Audio Amplification
Used in the Distortionless Power Amplifier

STOCKED IN FOLLOWING SIZES

1,000 OHMS	25,000 OHMS	80,000 OHMS	List Price $1.00 EACH
5,000 OHMS	30,000 OHMS	100,000 OHMS	
12,000 OHMS	48,000 OHMS		
20,000 OHMS	50,000 OHMS		

FOR USE IN THE REINARTZ, COCKADAY, SUPER PILODYNE CIRCUITS

Amplion

The World's Standard Loud Speaker

JUNIOR DE LUXE AR-5	$26.00
DRAGON AR-19	$40.00
BEAUTY AR-15	$46.00

You Will Never Tire of the AMPLION

Cardwell Condensers

Type	Capacity	Price
123B	.0005	$5.00
137B	.001	$6.00
141B	.00025	$4.25

In Stock at All Times

SUPPLIES

We have one of the LARGEST and MOST COMPLETE stocks of High Grade STANDARD APPARATUS in the United States and can make Prompt Shipments.

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THE RADIO MAIL ORDER HOUSE—KNOWN FOR LOW PRICES

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LONGACRE BUILDING, NEW YORK CITY

What's Wrong with Your Receiving Set?

Chapter VIII—"The Neutrodyne Circuit"

By Peter J. M. Clute

THE preceding discussion has pointed out the inherent advantages of tuned Radio frequency amplification, with its very interesting method of tuning by graphical selectivity. This basic system of tuned Radio has led directly to a consideration of the neutrodyne principle, which employs tuned Radio frequency amplification with complete neutralization of the inherent capacity coupling of the vacuum tubes and associated circuits.

Efficient amplification with the elimination of distorting regeneration, oscillation and re-radiation interference are combined in the neutrodyne receiver, which operates directly at peak value without any scratching, howling, or distortion. The properly constructed neutrodyne provides an exact, but not excessive amount of neutralizing energy for all requirements of the circuit. This insures that each stage of Radio frequency amplification will be at its maximum value for each wave length setting. With its high degree of amplification, its basic principle of non-reaction, its ability to give maximum selectivity, its broad operating range with maximum sensitivity on every wave length, and its extreme simplicity of tuning, the neutrodyne receiver has

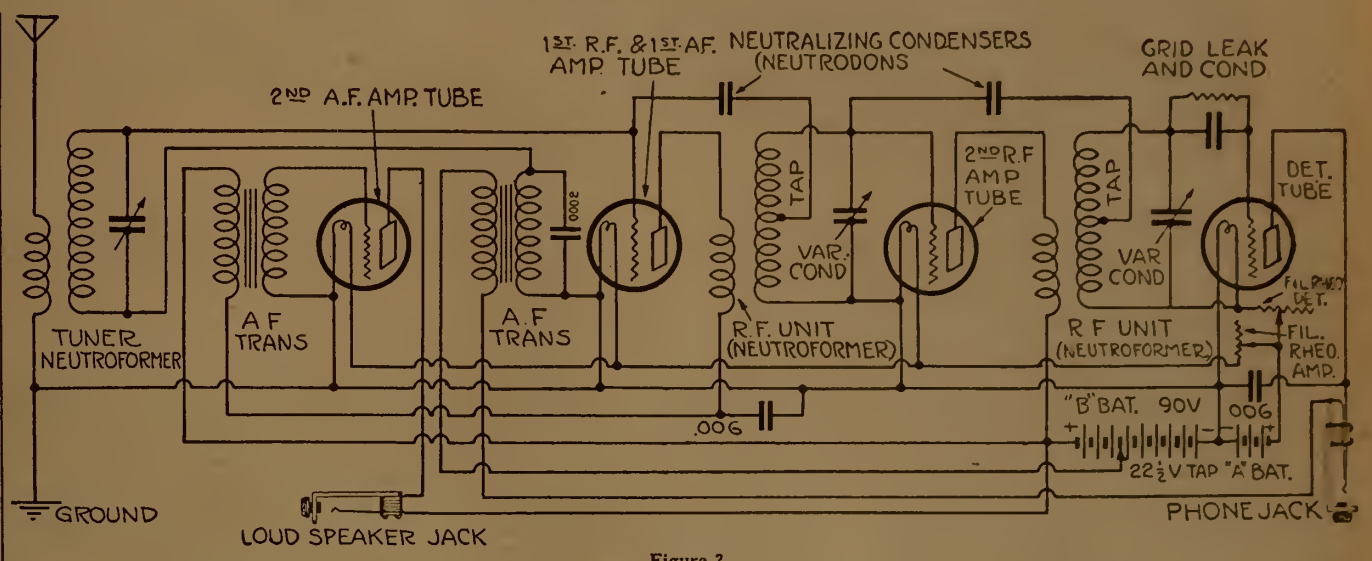


Figure 2

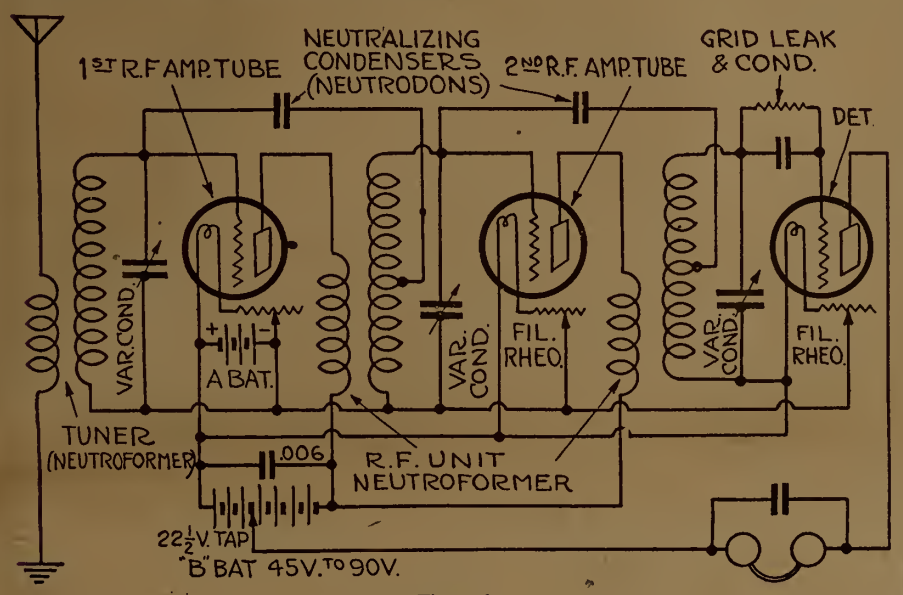


Figure 1.

demonstrated its superiority for both local and DX broadcast reception.

Efficient Radio Frequency Amplification

In the neutrodyne circuit, the inventor has accomplished something that has long been the goal of Radio engineers, namely, efficient Radio frequency amplification. The obvious disadvantage of attempting to combine pure Radio frequency amplification with the task of eliminating bothersome regeneration and oscillation has been the source of much worry to the experimenter. This regenerative effect will prevent clear reproduction, unless correctly designed transformers are employed. The neutrodyne principle has eventually succeeded in eliminating this disadvantage by reverting to the well known theorem that two equal and opposite forces balance or neutralize each other. While the internal capacity existing between the grid and plate in the vacuum tube is quite small, under certain conditions of operation the resulting regeneration in the amplifier tubes is a distinct hindrance to perfect reception. In the neutrodyne the capacity just referred to is neutralized by inserting another capacity of equal value in the circuit so as to act against or buck the capacity effect within the tube. This neutralizing condenser or neutrodon is a very special variable condenser with an extremely low capacity, capable of fine variations of from one to ten micro-microfarads. The critical adjustment of the neutrodyne circuit is dependent upon the neutrodon condenser, which consequently should be designed to have practically no losses at Radio frequency.

Average Values of Capacities

In this connection, it may be of interest to note the following average values in micro-microfarads of capacities between the vacuum tube elements:

	UV-199	UV-200	UV-201A
Between filament and grid	3.5	6.0	6.0
Between filament and plate	3.5	6.0	6.0

(Continued on page 25)

Thrills from Radio

No. 17 of a Series Featuring Experiences of "ALL-AMERICAN" Users

"All American" Proved to be Over 100% Better

By C. C. Gielow, Sandusky, Ohio

"Due to your continued advertising, I recently purchased several All-American Audio Frequency Transformers.

"Can safely state that I have neither seen, nor heard, their equal either in appearance or performance.

"Previously I had used transformers manufactured by an old firm, noted for the quality of its other products, but the 'All-Americans' won after a fair trial.

"They proved to be over 100% more efficient than the other transformers."

All-American Audio Frequency Transformers come in three ratios: 3-1, $4.50; 5-1, 10-1, $4.75. The best—no need to pay more.

Why spend money and waste time experimenting? Nearly three-quarters of a million radio enthusiasts, like Mr. Gielow, have already proved that "All-Americans" are best.

Special Offer

All-American Power Amplification diagram-circular and Book of 22 Tested Hook-ups sent for 4c in stamps to cover mailing.

All the better dealers sell the "ALL-AMERICAN"

RAULAND MFG. CO., 2650 Coyne St., CHICAGO

PIONEERS IN THE INDUSTRY

Audio and Radio Frequency: Power Amplifying (input and output)

More than 700,000 in use Standard on the better sets

ALL-AMERICAN

AMPLIFYING TRANSFORMERS

Largest Selling Transformers in the World

List $4.00

APEX AUDIOTRONS

"Sound Perfection"

Apex Audiotrons have been on the market for a considerable length of time. They have been sold throughout the country and results have been highly gratifying. Apex Audiotrons are now being advertised nationally for the reason that the factory output has become large enough to take care of a great demand.

This is the first time that a manufacturer has sold a tube with a full guarantee. Apex Audiotrons may be relied upon at all times.

APEX AUDIOTRON GUARANTEE

All Apex Audiotron tubes are guaranteed, and Dealers, as well as the manufacturers, will make replacement or refund the money on all tubes that prove unsatisfactory in any way. The only requirement is that the tube must not have been burned out.

All Tubes Are Guaranteed to Work in Radio Frequency. Especially Adapted for Neutrodyne, Reflex and Super-Heterodyne Sets.

The following tubes are now on sale:

Type 201A—5 volts, .25 amperes.....$4.00
Amplifier and Detector

Type 199—3-4 volts, .06 amperes.....$4.00
Amplifier and Detector

Type 199A—3-4 volts, .06 amperes.....$4.00
With Standard Base—Amplifier and Detector

Type 12—1½ volts, .25 amperes.....$4.00
Platinum Filament—Amplifier and Detector

Type 200—5 volts, 1 ampere.....$4.00
Detector Tube

If your local dealer cannot supply you, order direct

RADIO TUBE CORPORATION

70 HALSEY STREET NEWARK, N. J.

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

Station and City	Met.	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
CFCN, Calgary, Alta.	440	12:00- 1:00	Silent	11:00- 2:00	Silent	Silent	11:00- 1:00	Silent
CKAC, Montreal, Que.	425	Silent	6:00-10:30	Silent	6:00-10:30	Silent	6:00-10:30	3:30- 4:30
CKCD, Vancouver, B. C.	410	10:30-11:30	10:30-11:30	10:30-11:30	10:30-11:30	10:30-11:30	Silent	Silent
CKY, Winnipeg, Man.	450	Silent	8:15-10:00	Silent	8:15-10:00	8:15-10:00	Silent	7:00-10:00
CYB, Mexico City, Mex.	425	Silent	7:00- 8:30	Silent	7:30- 9:30	Silent	7:00- 8:30	Silent
CYL, Mexico City, Mex.	510	Silent	8:30-10:00	Silent	Silent	8:30-10:00	Silent	Silent
KDKA, E. Pittsburgh, Pa.	326	5:00- 9:00	5:00-11:30	5:00- 9:00	5:00-11:30	5:00- 9:00	5:00- 9:00	6:30- 7:30
KFAE, Pullman, Wash.	330	9:30-10:30	Silent	9:30-10:30	Silent	9:30-10:30	Silent	Silent
KFAF, Denver, Colo.	360	9:00-10:00	9:00-10:00	Silent	8:30- 9:00	9:00-10:00	9:00-10:00	Silent
KFOA, Seattle, Wash.	455	10:30-11:30	Silent	10:30-11:30	Silent	10:30-11:30	Silent	Silent
KFI, Los Angeles, Calif.	469	12:00- 1:00	8:45- 1:00	8:45- 2:00	8:45- 1:00	8:45- 2:00	8:45- 2:00	8:45- 1:00
KFNF, Shenandoah, Ia.	265	Silent	Silent	7:30- 9:00	7:30- 8:30	7:30- 8:30	7:30- 9:00	6:30- 7:30
KGO, Oakland, Calif.	312	Silent	10:00-11:00	Silent	10:00-11:00	Silent	10:00-11:00	Silent
KGU, Honolulu, Hawaii	360	12:00- 1:30	12:00- 1:30	12:00- 1:30	12:00- 1:30	12:00- 1:30	12:00- 1:30	12:00- 1:30
KGW, Portland, Ore.	492	10:00-11:30	9:45-10:30	10:00- 1:00	10:00- 1:00	10:00- 1:30	12:00- 2:00	9:00-10:00
KHJ, Los Angeles, Calif.	395	8:45- 2:00	8:45- 2:00	8:45- 2:00	8:45- 2:00	8:45- 2:00	8:45- 2:00	10:00-12:00
KLX, Oakland, Calif	509	10:00-12:00	9:00- 9:30	10:00-12:00	9:00- 9:30	10:00-12:00	9:00- 9:30	Silent
KPO, San Francisco, Calif.	423	10:00- 1:00	10:00- 1:00	10:00- 1:00	10:00- 1:00	Silent	10:00- 2:00	10:30-12:00
KQV, Pittsburgh, Pa.	360	9:00-10:00	Silent	9:00-10:00	Silent	9:00-10:00	Silent	Silent
KSD, St. Louis, Mo.	546	8:30- 9:30	8:00- 9:00	7:00-10:00	8:00- 9:00	Silent	9:00-10:00	Silent
KYW, Chicago, Ill.	536	Silent	7:00- 9:30	7:00- 2:00	7:00- 9:30	7:00- 2:00	7:00- 9:30	7:00- 8:00
NAA, Radio, Va.	435	5:45- 7:20	6:05- 7:20	6:25- 7:40	5:45- 7:40	7:05- 7:40	Silent	Silent
PWX, Havana, Cuba	400	Silent	Silent	7:30-10:00	Silent	Silent	7:30-10:00	Silent
WBAP, Fort Worth, Texas	476	7:30-10:45	7:30-10:45	7:30-10:45	7:30-10:45	7:30-10:45	7:00- 7:30	11:00-12:00
WBAV, Columbus, O.	390	6:00- 8:00	Silent	Silent	Silent	6:00- 8:00	Silent	Silent
WBZ, Springfield, Mass.	337	5:00- 8:00	6:30- 8:00	5:00- 8:00	6:00- 8:00	5:00-11:00	6:00- 8:00	5:45- 8:00
WCAE, Pittsburgh, Pa.	462	5:30- 9:00	5:30- 9:00	5:30- 9:00	5:30- 9:00	5:30- 9:00	5:30- 9:00	2:00- 5:30
WCAL, Northfield, Minn.	360	Silent	Silent	Silent	9:00-10:00	9:30- 9:30	12:00- 1:00	8:30- 9:30
WCAP, Washington, D. C.	469	Silent	6:30- 9:00	Silent	6:15-11:00	Silent	6:15-11:00	6:20- 9:00
WCBD, Zion, Ill.	345	8:00-10:00	Silent	Silent	8:00-10:00	Silent	Silent	2:30- 5:30
WCX, Detroit, Mich	517	7:30- 9:00	7:30-11:00	7:30- 9:00	7:30- 9:00	7:30- 9:00	Silent	6:15- 7:15
WDAF, Kansas City, Mo.	411	8:00- 1:00	11:45- 1:00	8:00- 1:00	11:45- 1:00	8:00- 1:00	11:45- 1:00	4:00- 5:00
WDAP, Chicago, Ill.	360	Silent	7:00- 1:00	7:00- 1:00	7:00- 1:00	7:00- 1:00	7:00- 1:00	9:15-11:15
WDAR, Philadelphia, Pa.	395	6:30-10:00	6:30- 7:00	6:30-10:00	6:30- 7:00	6:30-12:00	6:30- 7:00	Silent
WEAF, New York, N. Y.	492	6:30- 9:00	6:30- 9:00	6:30- 9:00	6:00-11:00	6:30- 9:00	6:30-11:00	6:20- 9:00
WEAY, Houston, Texas	360	6:00- 7:00	6:00- 7:00	6:00- 7:00	6:00- 7:00	8:00-10:00	8:00-10:00	8:00-10:00
WFAA, Dallas, Tex.	476	8:30- 9:30	8:30-12:00	Silent	8:30- 9:30	8:30- 9:30	8:30-12:00	6:00-11:00
WFI, Philadelphia, Pa.	395	5:30- 6:00	5:30-10:10	5:30- 6:30	5:30- 8:00	5:30- 6:30	5:30-10:10	6:30- 7:30
WGAZ, South Bend, Ind.	360	7:00- 8:30	Silent	7:00- 8:30	Silent	7:00- 8:00	Silent	Silent
WGI, Medford, Mass.	360	Silent	6:00- 7:30	6:30- 8:00	6:00- 7:30	6:30- 8:00	6:30- 8:00	7:30- 9:00
WGN, Chicago, Ill.	370	Silent	6:00-12:00	6:00-12:00	6:00-12:00	6:00-12:00	6:00-12:00	6:00- 9:00
WGR, Buffalo, N. Y.	319	5:30-12:00	5:30- 7:45	5:30-12:00	5:30- 7:45	5:30-12:00	5:30- 7:45	2:00- 4:00
WGY, Schenectady, N. Y.	380	6:45- 9:00	6:45- 9:00	Silent	6:45- 9:00	6:45-10:30	8:30- 9:30	6:30- 7:30
WHA, Madison, Wis.	360	7:30- 8:30	Silent	7:30- 8:30	Silent	7:30- 8:30	Silent	Silent
WHAS, Louisville, Ky.	400	Silent	7:30- 9:00	7:30- 9:00	7:30- 9:00	7:30- 9:00	7:30- 9:00	4:00- 5:00
WHAZ, Troy, N. Y.	380	8:00-10:00	Silent	Silent	Silent	Silent	Silent	Silent
WHB, Kansas City, Mo.	411	7:00- 7:45	7:00-10:00	7:00- 7:45	7:00-10:00	7:00- 7:45	Silent	8:00- 1:00
WHK, Cleveland, O.	283	5:00- 5:30	5:00- 5:30	5:00- 5:30	5:00- 5:30	5:00-10:00	5:00- 5:30	7:00- 9:30
WHN, New York, N. Y.	360	6:30-11:00	8:30-11:00	6:30-11:00	8:30-11:00	8:30-11:00	6:30-11:00	8:30-11:00
WIP, Philadelphia, Pa.	509	5:00- 6:30	5:00-11:00	5:00- 6:30	5:00-10:00	5:00- 6:30	5:00-11:00	8:30-11:00
WJAR, Providence, R. I.	360	Silent	6:00- 7:00	6:00-11:00	Silent	6:00- 9:00	Silent	Silent
WJAX, Cleveland, O.	390	Silent	6:30- 8:30	Silent	7:00- 9:30	Silent	Silent	Silent
WJY, New York, N. Y.	405	Silent	6:30- 9:30	Silent	6:30- 9:15	6:30-11:00	Silent	7:15-10:00
WJZ, New York, N. Y.	455	6:00-10:30	6:00-10:30	6:00-10:30	6:00-10:30	6:00-10:30	6:00-10:30	6:00- 9:30
WKAQ, San Juan, P. R.	360	Silent	7:00- 8:30	Silent	Silent	7:00- 8:30	Silent	Silent
WLAG, Minn.-St. Paul	417	6:15- 7:00	6:15- 7:00	9:30-10:45	6:15- 7:00	9:30-10:45	9:30-12:30	7:45- 9:15
WLW, Cincinnati, O.	309	8:00-10:00	10:00-12:00	8:00-10:00	10:00-12:00	Silent	Silent	7:45- 8:45
WMAQ, Chicago, Ill.	448	Silent	7:00-10:00	7:00-10:00	7:00-10:00	7:00-10:00	7:00-10:00	Silent
WMC, Memphis, Tenn.	500	8:30- 9:30	8:30-12:00	Silent	8:30- 9:30	8:30-12:00	8:30- 9:30	Silent
WNAC, Boston, Mass.	278	5:00- 9:00	7:00- 9:00	5:00- 9:00	7:00- 9:00	5:00- 9:00	8:00- 9:00	6:30- 8:30
WOAI, San Antonio, Texas	385	9:30-10:30	9:30-10:30	Silent	7:30- 8:30	Silent	Silent	9:30-10:30
WOAW, Omaha, Neb.	526	6:00-11:00	6:00-11:00	Silent	6:00-11:00	6:30-11:00	6:00-11:00	9:00-11:00
WOC, Davenport, Ia.	484	8:00-11:00	Silent	8:00- 9:00	9:00-10:00	8:00- 9:00	9:00-10:00	7:00-11:00
WOO, Philadelphia, Pa.	509	6:30-10:00	Silent	6:30-10:00	Silent	6:30-10:00	Silent	Silent
WOQ, Kansas City, Mo.	360	Silent	8:00- 9:30	Silent	8:00- 9:30	Silent	8:00- 9:30	7:00- 7:45
WOR, Newark, N. J.	405	5:15-10:00	5:15- 6:30	5:15-10:00	5:15- 6:30	5:15- 6:30	5:15-10:00	Silent
WOS, Jefferson City, Mo.	441	8:00- 9:30	Silent	8:00- 9:30	Silent	8:00- 9:30	Silent	7:30- 8:30
WRC, Washington, D. C.	469	Silent	7:00-10:00	Silent	7:00-10:00	Silent	7:15-10:00	Silent
WRM, Urbana, Ill.	360	Silent	7:00- 9:30	Silent	8:30- 9:30	Silent	Silent	Silent
WSAI, Cincinnati, O.	309	Silent	7:00-10:00	Silent	8:00-10:00	Silent	10:00- 1:45	Silent
WSB, Atlanta, Ga.	429	8:00-12:00	8:00-12:00	Silent	8:00-12:00	8:00-12:00	8:00-12:00	7:30- 2:00
WSY, Birmingham, Ala.	360	Silent	Silent	Silent	Silent	Silent	Silent	8:00- 9:00
WTAM, Cleveland, O.	390	Silent	Silent	7:00- 9:30	Silent	Silent	8:00-10:00	Silent
WTAS, Elgin, Ill.	286	8:15-12:00	8:15-12:00	8:15-12:00	8:15-12:00	8:15-12:00	8:15-12:00	8:15-12:00
WTAY, Oak Park, Ill.	283	Silent	6:15- 8:15	6:15- 8:15	6:15- 8:15	6:15- 8:15	6:15- 8:15	Silent
WWJ, Detroit, Mich.	517	7:30- 8:30	7:30- 8:30	7:30- 8:30	7:30-11:00	7:30- 8:30	6:00- 7:30	6:30- 7:30

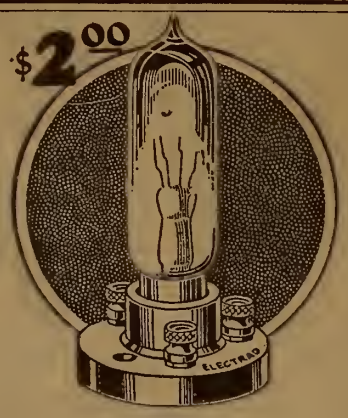
Instructions for Use.—All the hours above are given in Central Standard Time. If your city uses Eastern Time, add one hour to each of the periods stated; if your city uses Mountain Time, subtract one hour; if your city uses Pacific Time, subtract two hours. This table includes only the evening broadcasts,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

It is a waste of time and money for an amateur to try to make head receivers, audio frequency transformers and home-made battery chargers.

Never leave the high-tension battery leads near the filament leads when they are disconnected, as contact will result in the burning out of the tube.

Harkness Reflex New Electrad Diode Tube

Endorsed by Kenneth Harkness



SOCKET 50c

IF YOU are building any Reflex Circuit, be sure to use a Diode Tube as a rectifier.

Diode Tubes are better for all detector purposes. Give greater volume than a crystal. Never get out of adjustment. Stabilize the circuit—overcome distortions, howling, etc. Require no B Batteries. With ordinary care they will burn 600 to 1000 hours.

Sold by most good radio stores. If your dealer cannot supply you, send us $2.50 and we will see that you are supplied.

FREE—If you are buiding any Reflex Circuit, ask your local dealer for our complete and detailed diagrams of the Harkness, and instructions for the use of a Diode Tube in place of a crystal.

ELECTRAD Inc.

NEW YORK CHICAGO

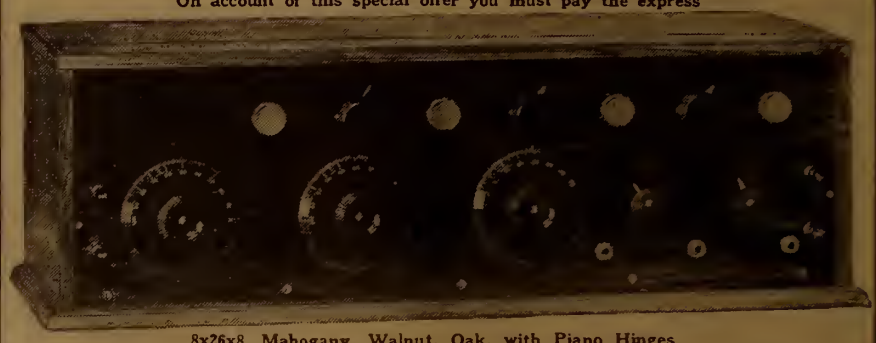
5 Tube Neutrodyne

PAY NO MONEY
Just Pay The Postman

$12.50 CABINET FREE

Special Ten Day Offer with Each Set

On account of this special offer you must pay the express



8x26x8, Mahogany, Walnut, Oak, with Piano Hinges

ALL STANDARD PARTS

WHEN you get this magnificent looking set wired and hooked up, you will be able to hear all stations without interference. All parts are same as illustrated in Radio Digest, Feb. 2nd. Panel is mahogany with beautiful mahogany dials—a set fitted for the most exclusive home.

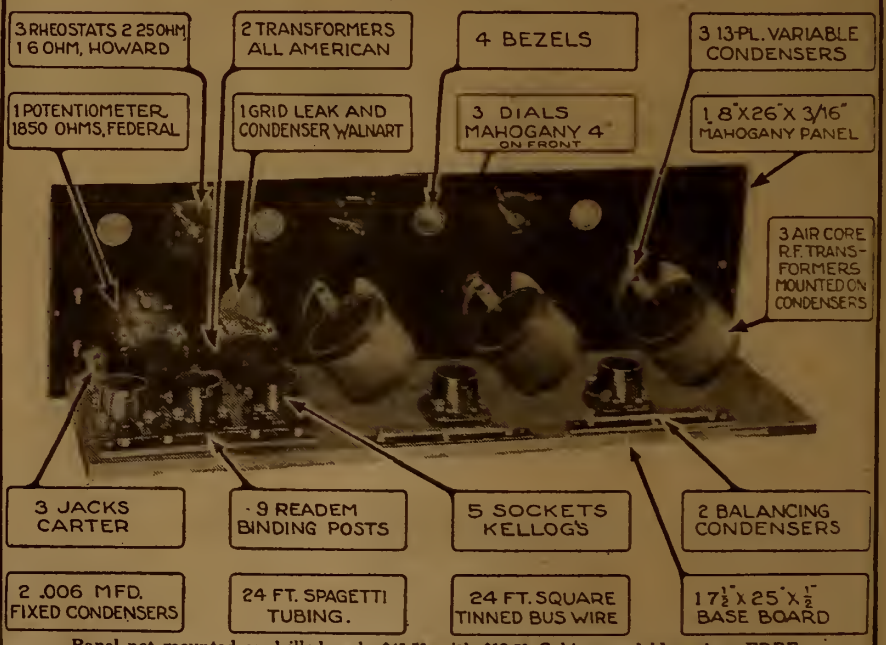
2 Rheostats, 25 ohms, Howard	$ 2.00
1 Rheostat, 6 ohms, Howard	.90
3 Air Core R. F. Transformers, mounted on condensers, and 2 balancing condensers	20.00
1 Potentiometer, 1850 ohms, Federal	1.85
3 Jacks, Carter	2.70
2 .006 Condensers	.40
1 Grid Leak with Condenser, Walnart	.65
5 Sockets, Kellogg's	5.00
2 Transformers, All-American	9.50
9 Readem Binding Posts	.85
1 8x26 Mahogany Panel	3.64
4 Bezels	.80
3 Dials, Mahogany, 4 in.	4.50
1 Baseboard	.50
24 ft. Square Bus Wire	.60
24 ft. Spaghetti	.80
	$54.69
For Ten Days, Cabinet	12.50
	$67.19

BLUE PRINT FREE
EASY TO WIRE

$48.50

SEE BELOW

Mounted on Panel and Baseboard



Panel not mounted or drilled, only $45.50 with $12.50 Cabinet and blueprints FREE.

COMPLETE WITH ALL EQUIPMENT

IN ADDITION TO ABOVE PARTS

5 Tubes	$25.00	2 22½ Volt B Batteries	$ 6.00
1 110 Ampere Storage Battery	18.00		$86.00
1 DeLuxe Homecharger	18.00		
1 Headset	12.00	Loud Speaker	12.50
1 Complete Aerial Equipment	1.50		
1 45 Volt B Battery	5.50	TOTAL	$98.50

The above parts and equipment complete would cost you $159.50! Our Price $125.00

Written Money Back Guarantee with Each Set

Special Sale on Webster Condensers, Fine for Super-Heterodyne

Variable Condenser, .0005 (same as 23 plate), list. $5.50. While they last—Bargain at..... $2.98

Variable Condenser, .001 (same as 45 plate). list, $6.00. Big buy at..... $2.98

We are responsible folks, money cheerfully refunded within ten days if you are not satisfied

All Orders Mailed Promptly. Send Check or Money Order. No Stamps Accepted.

Everything in Radio. Write Us

Quality Merchandise at Low Prices

Economical Radio House

4600 LINCOLN AVENUE, CHICAGO

We Personally Guarantee All Goods

WHAT TO HEAR, WHEN AND WHERE

Tuesday, April 15

CKAC, Montreal, Canada (Eastern, 425), 4:00 p. m., Music; 7:00, Kiddies' stories in French and English; 7:30, Rex Battle and his Mt. Royal Hotel Concert Orchestra, Benjamin Scherzer, violinist; 8:30, French concert, direction of Raoul Vennat; 10:30, John C. Smith and his Mount Royal Hotel Dance Orchestra. Featuring Teddy Brown.

KDKA, E. Pittsburgh, Pa. (Eastern, 326), 12:20 p. m., Lenten services, Trinity church, Rev. Alexander Mann; 5:30, "Jesus Christ, His Only Son," Rev. Hugh Thomson Kerr; 6:15, Dinner concert, Grand Symphony Orchestra; 7:15, "The Importance of Personal Problems in the Field of Public Utilities." A. W. Tobertson; 7:30, Wendall Hall; 8:00, "Humanity," from the Autobiography of Benjamin Franklin, Dr. John Ray Ewers; 8:15, "The Contemporary Novel; What a Novel Is and Why Read It?" Frederick P. Mayer; 8:30, Concert, Mendelsohn Quartet, Marian L. Bomhard, soprano; Ellen Wilcox, contralto; Alfred C. Hagem, tenor; W. D. Stewart, bass; J. K. Milligan, accompanist.

KFAF, Denver, Colo. (Mountain, 360), 8:30 p. m., Speaker, George Holmes, Pres. Kiwanis Club.

KFKB, Milford, Kansas (Central, 286), 8:05 p. m., "Business Methods in Dairying," Prof. H. W. Cave; 8:30, "Marketing the Egg Crop," Prof. L. F. Payne; Vocal solos, Mrs. William T. Miller; Jessie Bogue, Charles Stratton, pianists.

KGO, Oakland, Calif. (Pacific, 312), 8:00 p. m., Arion Trio; Lucy Vance, soprano; Irving Krick, pianist; Glenn Chamberlain, tenor; Blanche A. Hawkins, whistler; Mildred Jensen, accompanist; "My Friend, the Dog," Otto Riehl; William Snow, French horn player; Bruce A. Wilson, saxophonist; "That Something," Guy B. Kibbee.

KGW, Portland, Ore. (Pacific, 492), 12:30 p. m., Concert, Civic Music Club; 3:30, Talk, Jeannette P. Crsmer; 7:45, Talk for farmers, Oregon Agricultural College extension service.

KPD, San Francisco, Calif. (Pacific, 423), 1:00-2:00 p. m., Rudy Seiger's Fairmout Hotel Orchestra; 2:30-3:30, Organ recital, Theodore J. Irwin; 4:30-5:30, Rudy Seiger's Fairmont Hotel Orchestra; 5:30-6:30, Children's hour stories, "Big Brother" of KPO, Book of Knowledge; Jack Costa, pianist, 10 years; 6:30-7:00, "Cleveland Six" Orchestra, Will Gunzendorfer, director; 7:00-7:30, Rudy Seiger's Fairmont Hotel Orchestra; 8:00-10:00, Program, management, Mme. Stella Vought; 10:00-11:00, E. Max Bradfield's Versatile Band.

KSD, St. Louis, Mo. (Central, 546), 8:00 p. m., Studio program, Ica Pfisterer, soprano; Marietta Schumacher, contralto; Beatrice Knetsger, pianist.

KYW, Chicago, Ill. (Central, 536), 11:35 a. m., Table talk, Mrs. Anna J. Peterson; 2:35 p. m., Studio program; 4:00, "Bringing the World to America." "Our World"; 6:18, "Astronomy," Rev. D. J. McHugh; 6:45, Bedtime story, "Uncle Bob," Walter Wilson; 7:00, Dinner music, Congress Hotel, Joska DeBabary's Orchestra, Clyde Doerr's Orchestra; 8:20, American Farm Bureau Federation speakers, "The Farmer's Taxes," H. W. Moorhouse; "The Home You Loved to Live In," K. J. T. Ekblawof; 8:48, Musical program, Chicago Musical College, D. Paul Brietwiser.

WAAM, Newark, N. J. (Eastern, 255), 7:00-7:30 p. m., "Star Spangled Banner," Bluecrest Dance Orchestra; 7:30-8:00, Jimmy Clark and His Broadway Melody Entertainers; 8:00-8:15, Ailce Carter and Jimmy Johnstone; 8:15-8:30, Arundei Cotter, of Wall Street Journal, talking on Samuel Vauclair, president of the Baldwin Locomotive Works; 8:30-8:45, Mercedes Gilbert, monologist; 8:45-9:00, Irving Bachelor and Leo St. Cloud, duets; 9:00-9:30, Continuation program by Bluecrest Dance Orchestra; 9:30-9:45, "Paintings and Their Place in the Home," talk by Iola Dalton Kire; 9:45-10:00, Robertson kiddies, Edna and May; 10:00-10:30, American Warblers; 10:30-11:00, George Williams, John Hill and the Trianon Melody Ensemble; 11:00-11:15, Chas. Le Roy, pianist; 11:15-11:30, Bob Schafer and Dave Ringle, songbirds.

WAAW, Omaha, Neb. (Central, 360), 8:00 p. m., Lenten services, conducted by Rev. E. T. Otte, pastor of St. Paul's Lutheran Church, of Omaha.

WBAH, Minneapolis, Minn. (Central, 417), 12:30-1:30 p. m., Musical programs, Jean Eatinger, pianist; Russell Murphy, baritone; 7:00-7:30, Musical, Minneapolis Boy Scouts.

WBAP, Fort Worth, Texas (Central, 476), 7:30-8:30 p. m., Concert, E. Clyde Whitlock, violinist and pupils; 9:30-10:45, Concert, auspices Mrs. Louis Morris, vocalist.

WBAV, Columbus, Ohio (Eastern, 390), 12:00 m., Piano music, Ila Lorbach Oweus.

WBZ, Springfield, Mass. (Eastern, 337), 7:00 p. m., "The Fruit Garden," William H. Wolff; 7:30, Bedtime story for the Kiddies; 7:40, Concert, Benjamin Buxton, pianist; 8:30, Concert, Boston University Musical Clubs.

WCAE, Pittsburgh, Pa. (Eastern, 462), 4:30 p. m., Sunshine Girl; 6:30, Diuner concert, William Penn Hotel; 7:30, Uncle Kaybee; 7:45, Theatrical review; 8:30, Musical program, students, Prof. Joseph H. Moore.

WCAL, Northfield, Minn. (Central, 360), 9:00 p. m., Esther Ringstad, soprano; Marcella Rogness, pianist; Arnold Hamre, tenor; Evelyn Neste, Judith Haldorson, accompanists.

WCX, Detroit, Mich. (Eastern, 517), 6:00 p. m., Dinner concert, Hotel Tuller; 8:15, Lenten speaker, Rev. John A. McClory, S. J.; 10:00, Red Apple Club.

WDAF, Kansas City, Mo., Star (Central, 411), 3:30-4:30 p. m., Musical matinee, Joseph Black's Sexton Cafe Concert Orchestra; 6:00-7:00, School of the Air; Piano tuning-in number, Duo-Art; Address, speaker, National Live Stock and Meat Board; The Tell-Me-a-Story Lady; Music, Fritz Hanlein's Trianon Ensemble; 11:45 p. m.-1 a. m., Nighthawk Frolic, "The Merry Old Chief" and Coon-Sanders Orchestra.

Headliners of the Week

NO DOUBT, many Radiophans living out in the country far from civilization are following with interest the courses given them through the courtesy of KFKB and the Kansas State Agricultural College. Two lectures are given *Tuesday* for the dairy farmer.

This week is Easter week and all stations are respectfully offering their microphones for the purpose of carrying Easter thoughts to the listener in. WTAM is planning such a program *Wednesday evening.* Rev. DuMoulin will talk, L. W. Zimmerman will give a reading, Richard Finnegan, the boy soprano, will sing.

WGY is offering every *Thursday* a series of book reviews. The books talked about are always non-fiction, so that here is your chance to become a highbrow.

Friday, the cantata "Seven Last Words of Jesus," will be broadcast from the Christ Church Cathedral by KSD. This music is very lovely and let us hope the ether carries it to all of you. Friday afternoon WMAQ begins a series of dressmaking lessons, so stand by, ladies.

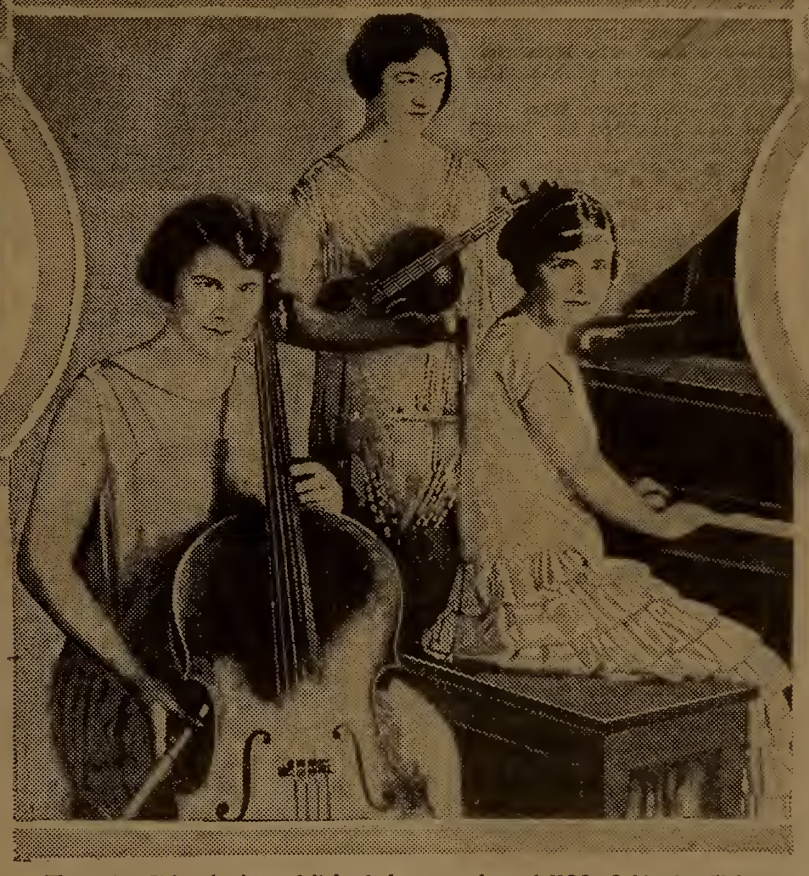
The *Saturday* program given by CKAC will be given by the Frontenac Breweries Band and Artists direct from the Frontenac Breweries. Enough said.

Wake up early *Sunday* morning and tune in for WCAL. They are offering an Easter Morning service at 6:00 a. m.

Monday, KGW is giving the joint harp recital of Ruth Lorraine Close and Helen Martin and those who have not heard them must be sure to tune in.

Fishermen who have planned to catch trout during their vacation in the Denver mountains should certainly get the hints offered through KFAF *Tuesday* by R. G. Parvin, State Fish and Game Commissioner.

L. R. Tucker, a Big Brother, who reads stories from the Book of Knowledge from 5:30 to 6:30 p. m. on Mondays, Tuesdays, Wednesdays and Thursdays. This is broadcast from KPO, Hale Bros., San Francisco.



The Arion Trio who have delighted the many fans of KGO, Oakland, will be heard again on Tuesday evening, April 15. The members of the trio from left to right are: Margaret Avery, cello; Josephine Holuh, violin, and Joyce Barthelson, piano.

Leonore Pilgrim Schwab will be in charge of the program presented by the Pilgrim family from WLW, Cincinnati, on Tuesday evening, April 15. In addition to being in charge of the program, Miss Schwab, who has a very pleasing soprano voice, will sing several selections.

WDAP, Chicago, Ill. (Central, 370), 7:00-8:00. p. m., Drake Concert Ensemble and Blackstone Quintet; 8:00-8:30, Ralph Emerson, organist; 10:00, Rosemary Hughes, Vorice Worthy, Fred Agard, Jack Chapman's Orchestra.

WDAR, Philadelphia, Pa. (Eastern, 395), 11:45 a. m., Daily Almanac; 12:02 p. m., Organ recital, Stanley Theater; Dinner music, Arcadia Concert Orchestra; 2:00, Piano recital, Edna Finestone; Arcadia Cafe Concert Orchestra; 4:30, Recital, Max Eisenberg, tenor; 7:30, Dream Daddy's bedtime stories; 7:50, Play review, Arnold Abbott.

WEAF, New York, N. Y. (Eastern, 492), 11:30 a. m., Motion picture talk; 11:45, Board of Education; 12:00 noon, Lenten church services; 4:00 p. m., Blue Horse Instrumental Quartette; 5:00, Children's hour stories; 7:30, Thornton Fisher; 7:40, Christina Thompson, pianist; 8:00, Corn Products Refining Orchestra; 8:30, Republican State Convention; 9:45, Claire Lampman, contralto; 10:00, Everready program.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., Address, DeWitt McMurray; 8:30-9:30, Nash Symphony Orchestra; 11:00-12:00, Piano recital, Katherine B. Peeples and assisting musicians.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Meyer Davis Bellevue Stratford Concert Orchestra; 9:00, Philadelphia Musical Club; Women's Symphony Orchestra of Phila.; Mabel Swint Ewer, president; J. W. G. Lehman, conductor; Florence Haenle, soloist; 6:00, Sunny Jim, the Kiddies' Pal; 6:30, Meyer Davis Bellevue Stratford Concert Orchestra; 8:00, Lenten Cantata by Charles H. Maskell; choir Mt. Hermon Reformed Church; 8:30, Wilson A. Chest, tenor; Henry L. Booth, barltone; 10:30, Charlie Kerr and his Symphonic Dance Orchestra.

WGI, Medford Hillside, Mass. (Eastern, 360), 12:00 m., Selection on Ampico in Chickering; Chat with Ladies, Marjorie Drew; Selections on Brunswick; 7:00 p. m., Meeting of the Amrad Big Brother Club; 7:30, "Africa from Cape Town to the Congo," as seen by a Commercial Traveler, A. S. Flint; Musicale.

WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1:00 p. m., George Albert Bouchard, organist; 2:30-4:00, The Radio Dealers' Musical program; 6:00-7:30, Chamber music recital.

WGY, Schenectady, N. Y. (Eastern, 380), 2:00 p. m., "The Decorations of the White House," Mrs. Capitola Ashworth; 6:30, Dinner concert, Instrumental Trio of Hotel Teu Eyck; 7:45, "The Present Day Undergraduate," Dean Edward Ellery; 8:00, Scotch program, Pipers, Campbell MacRae, Willism I. Riddell; Jean H. Gray, contralto; Robert MacNeish, tenor; Mrs. Harry Bertram, soprano; Robert Stewart, baritone.

WHAA, Iowa City, Iowa (Central, 484), 8:00 p. m., Interpretative reading of "Romeo and Juliet." Helene Blattner, Vance Morton.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Strand Theater Orchestra; Walnut Theater Orchestra; Alamo Theater Organ; 7:30-9:00, Louisville Flute Club; Reading, An Interesting Historical Episode.

WHB, Kansas City, Mo., Sweeney School (Central, 411), 12:35-1:00 p. m., Popular program, Sweency Radio Orchestra; 2:00-3:00, Ladies' hour program, Sweeney Radio Orchestra; 3:00 p. m., Weather and market information; 7:00-8:00, Musical numbers, Sweeney Radio Orchestra; Talk on "Gardens," Mrs. Paul Briggs; 8.00-10:00, Sweeney Radio Orchestra and program by assisting artists.

WIP, Philadelphia, Pa. (Eastern, 509), 1:00 p. m., Organ recital, Karl Bonawitz; 3:00, Six Saxophone Serenaders, Philadelphia Dental Trio, William Rothner, Samuel Slopkin and Irving W. Capelman, assisted by Matilda Broadman; 6:05, Dinner music, Dick Regan and his WIP Symphony Orchestra; 7:00, Uncle Wip'a bedtime atories; Piano duet, Franklin Faddes and E. Kottcamp; 8:15, Philadelphia Police Band, direction Lieutenant Joseph Kiefer; 9:15, Mme. Lyd Rogister, cellist; Caroline Neebe, pianist; Chas. J. Smithwell, basso; 10:15, Ted Weems and his Cafe L'Aiglou Orchestra.

WJAX, Cleveland, Ohio (Eastern, 390), 7:30 p. m., Concert program arranged by the Cleveland News-Leader; Bedtime story, E. G. Johnson; Radio Talk Cartoon, Don Palmer; 8:00 p. m., Robinson's Circus, broadcast from the ringside in Public Auditorium.

WJY, New York, N. Y. (Eastern, 405) 7:30 p. m., "Selma Lagerlof;" 8:00, "Broadcasting Broadway," Bertha Brainard; 8:15, Evelyn Schiff, soprano; 8:35, New York University concert; Albert Stoessel, violinist; Mme. Kathryn Bacon, pianist; 10:00, Humorous readings, T. Constance McClure; 10:15, Paul Morenzo, tenor; Athens Buckley, soprano.

WJZ, New York, N. Y. (Eastern, 455), 12:00 m., Lenten service, Trinity church, Rev. Charles Fiske; 1:00 p. m., Henry Van Der Zandeu's Hotel Ambassador Trio; 2:00, New York Board of Education; 3:00, Special afternoon concert, Wanamaker Auditorium; 4:00, Elinor Gunn's fashion talk; 4:15, "Right Habits of Reading," Prof. Howard R. Driggs; 4:45, "Home Beautiful," Dorothy Ethel Walsh; 5:00, Chateau music program; Harry Rocco, baritoue; Miss Phillips, soprano; Anthony Gale, pianist; Louis Levlue violinist; 7:00, J. K. Hamilton, tenor; 7:15, Supper music, Paul Specht's Alamac Hotel Orchestra; 8:15, "How to Analyze Yourself," Norman T. Raymond; 8:30, Narinska, pianist; 9:00, "How Tea and Coffee Put Punch in the Menu," Anne Lewis Pierce; 9:15, U. S. Army Night; 10:30, Dance music, Hotel Astor Grill Orchestra, A. Eps, leader.

WLAG, Minneapolis-St. Paul, Minn. (Central, 417), 10:45-11:15 a. m., Houshold hints; 11:35 a. m.-12:00 m., Surprise hour; 2:00-2:30 p. m., "Federal Aid," Mrs. Frank E. Loehr; 2:40-4:00, Daylight concert; 4:00-4:30, WLAG Players presenting "Suicides;" 5:30-6:00 p. m., Children's stories, Macalester College Girls; 6:00-6:15, "Archery," H. H. McChesney; 6:15-7:00, Dinner hour concert St. Paul Hotel Orchestra, Sam Heiman, director; 7:30-8:15, Farm lectures, "U. S. Veteran's Bureau," Chas. A. Reese; "Marketing of Hay," H. L. Elliott.

WLW, Cincinnati, Ohio (Central, 309), 4:00 p. m., Topics of interest to women; 10:00, Entertainment, Band of the Hamilton County Knights of the Ku Klux Klan; Leonore Pilgrim Schwab presents the Pilgrims; Master Norman Pilgrim, trumpetist; Eva Pilgrim, pianist, Garth Pilgrim, cornetist, Masked Serenaders.

WMAQ, Chicago, Ill. (Central, 447.5), 4:20 p. m., Items of interest to women; 4:30, Pupils Glen Dillard Gunn School of Music; 5:00, Weeky Child Life talk for children, 7:00, Travel talk, Clara E. Laughlin, Program, Loyola University; 8:00, Talk, Harry Harmon; 8:20, Americanization lessons, 8:50, La Salle Orchestra; 9:10, Lecture, University of Chicago, 9:30, Lyon & Healy program.

WMC, Memphis, Tenn. (Central, 500), 8:00 p. m., "Uncle Sam in Europe," Dr. Albert Bushnell Hart, Ill. Pipe organ, Prof. H. O. Nichols.

WOAW, Omaha (Central, 526), 6:00 p. m., Lions Club program; 9:00, Vocal students of J. Edward Carnal.

WDC, Davenport, Iowa (Central, 484), 12:00 p. m., Chimes concert; 3:30, "Rheumatism," A. G. Heinrichs; 5:45, Chimes concert.

WDO, Philadelphia, Pa. (Eastern, 509), 11:00 a. m., Organ recital, Mary E. Vogt, 12:02 p. m., Wanamaker Crystal Tea Room Orchestra, Robert E. Golden, director; 4:45, Organ recital, Mary E. Vogt.

WOQ, Kansas City, Mo., Western Radio Co. (Central, 360), 7:00-7:45 p. m., Edison Recreation program; 8:00-10:00, Special program arranged and presented by Hal Kiefer and O. J. Ochs.

WSB, Atlanta, Ga. (Central, 429), 12:00 m., Entertainment, 3:30-4:00 p. m., Howard Theater overture and prologue; 5:00, Music, 5:30, Bonnie Barnhardt's songs and bedtime story; 8:00-9:00, Yarrab Temple Million Dollar Shrine Band; 10:45-11:45, DeMolay "On to Washington" concert.

WWJ, Detroit, Mich. (Eastern, 517), 8:00 a. m., Setting-up exercises, R. J. Horton; 9:45, Fred Shaw pianist; 12:00 m., Edward Barnes, baritone; LeRoy DeTurk, tenor; 3:00 p. m., News Orchestra; 7:00, News Orchestra; Thaddeus Wronski, vocalist.

Wednesday, April 16

CKAC, Montreal, Canada (Eastern, 425), 1:45 p. m., Mt. Royal Hotel Concert Orchestra; 4:30, Mt. Royal Hotel Dance Orchestra.

KDKA, E. Pittsburgh, Pa. (Eastern, 326), 12:20 p. m., Lenten services, Trinity Church, Rev. Alexander Mann; 5:30, "The Communion of Saints," Rev. Hugh T. Kerr; 6:15, Dinner concert, Pittsburgh Athletic Association Orchestra; 7:15, "The City Rightfully," Dr. Carl Wallace Petty; 7:30, Wendell Hall; 8:00, Program, arranged by the United Synagogue of America; 8:30, Concert of Spanish music, KDKA Little Symphony Orchestra, Trio, Helen Clough, soprano, Ashley Brockett, baritone, Ada Virasoro de Narud, reader; Gunnar Narud, pianist.

KFAE, Pullman, Wash. (Pacific, 330), 7:30 p. m., "Soils," Prof. George Severance; "Casualties During the War," Prof. A. B. Pence, "Reparations and War," Dr. F. F. Potter; Reading, Leone Webber; "Home Gardening Pointers," M. D. Armstrong, "Potatoes for Seed," George L. Zundel; Music.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., Detective stories by Detective Nick Harris, Concert; 8:00-9:00, Evening Herald concert; 9:00-10:00, Examiner concert; 10:00-11:00, Concert presented through courtesy by Hollywoodland Community Orchestra; 11:00-12:00, Ambassador-Max Fischer Cocoanut Grove Orchestra.

KFKB, Milford, Kansas (Central, 286), 8:05 p. m., "Orderly Marketing of Kansas Wheat," Prof. R. M. Green; 8:30, Timely topics; Boyd Ringo, pianist, Faculty Trio; Vocal solos, Edna Ellis.

KFDA, Seattle, Wash. (Pacific, 455), 8:30 p. m., Sherman, Clay & Co. presents Seattle's most popular orchestras.

KGW, Portland, Ore. (Pacific, 492), 12:30 p. m., Concert, Darby's Orchestra; 3:30, Children's program, 8:00, Orchestra concert; 9:00, Alexander Hamilton Institute business talk, James Albert; 10:00, Dance music George Olsen's Metropolitan Orchestra.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Program presenting Arthur Raymond Hill, tenor, and Bill Hatch, pianist; Garden talk by Fred C. McNabb of the Aggeler & Musser Seed Co.; 2:30-3:30, Program presented by courtesy of Barker Brothers; 6:45-7:30, Children's program, presenting Catherine Craig, reader 15 years, Seida Anthony, pianist 13 years, pupil of Kenneth E. Campbell; Dick Winslow, juvenile reporter; 8:00-10:00, Program through courtesy of Estelle B. Mills, Studebaker Radio Orchestra, of Long Beach; Dr. Mars F. Baumgardt.

KLX, Oakland, Calif. (Pacific, 509), 8:00-10:00 p. m., Studio program, Wiley B. Allen Co., Suprano duets, Charlotte Hatch, Bernice Hackett, Mildred Hackett, pianist; Octo Linquist, tenor; Dean Donaldson, violinist; Stanley Painter, baritone; Myrth Lucy, soprano; Maybell Sherburne West, pianist; Reading, Anne Brigman; Aurelia Frazee, pianist.

KPD, San Francisco, Calif. (Pacific, 423), 1:00-2:00 p. m., Rudy Seiger's Fairmont Hotel Orchestra, 2:30-3:30, California Collegians; Victor Towtley, tenor; Theodore J. Irwin, accompanist; Barron Hartsough, pianist; 4:30-5:30, Rudy Seiger's Fairmont Hotel Orchestra; 5:30-6:30, Children's hour, "Big Brother," of KPO; Eleanor Berland, pianist; 7:00-7:30, Rudy Seiger's Fairmont Hotel Orchestra; 8:00-11:00, E. Max Bradfield's Versatile Band.

KSD, St. Louis, Mo. (Central, 546), 6:30 p. m., Program, Abergh's concert ensemble; 9:00, Studio program, Tyrolean music, John Buecher, Albers Knettel, tenors; Rudolph Schneider, Carl Spalinger, bassos; Olga Bierman, yodler; Zithers, Martin Kiefer, Mrs. Gries, Hugo Eisler; Fred Kiefer, violinist, Karl Hahn, pianist; 11:00, Hotel Statler dance music, Rodeuich's Orchestra.

KYW, Chicago, Ill. (Central, 536), 11:35 a. m., Table talk, Mrs. Anna J. Peterson, 6:00 p. m., Symphonous, Prof. A. A. Brasch; 6:45, Children's story, "Uncle Bob" 7:00, Dinner concert, C

(Continued on page 16)

EARL CARROLL'S "VANITIES" ON A

First Act of "Vanities"

MUSICAL comedy enthusiasts and the world in general will have an opportunity to hear Earl Carroll's "Vanities" next Tuesday night, April 22, at 8:15 Central time, when Station KYW, Chicago, broadcasts the entire first act direct from the Colonial theater, where the "Vanities" will have opened the night previous. KYW uses a wave length of 536 meters. The program of the first act is given so that listeners can follow the action more closely.

The program will begin at 8:15 with a short talk by Mr. Carroll, probably the only producer and manager who admits that broadcasting is a great business getter for a show. The great success of the "Vanities" over many other well-known musical comedies, should be a point in Mr. Carroll's favor. His praise of Radio and the story of the fight he has had in the support of his belief, are given elsewhere in this paper. The program should be over by 10 p. m., Central time.

Scene 1—The Birth of a New Revue

The Composer.....L. Barton Evans
The New Born.....Mlle. Renova
The Cohan Revue..... Polly Lux
The Winter Garden.....DeLorez
White's Scandals.....Vera King
Greenwich Village Follies.....
.....Lota Cheeke
The Music Box.....Edith Parker
Ziegfeld Follies.....Betty Fitch

Scene 2

Musical Number, "Girls Were Made for Dancing," sung by Frank Blyler with Margaret Davies, assisted by Amy Frank, Lucille Moore and girls, followed by Al Thomas and Olga Borowska.

Scene 3

Baritone Solo.....J. Frank Leslie

Scene 4

A Singing Lesson.....Irene Ricardo
Harry Burns and Chas. Senna.

Scene 5—"The Soul of a Harp"

My string of pearls upon a harp belong
A golden harp of melody and song;
And as I play the string of pearls,
A vision comes of lovely girls,
I see a girl, but who knows if what I behold
Is not the soul that dwells within my harp of gold?

The Singer.....Ruth Oswald
The Harpist.....Carlena Diamond
The Child.....Elsie Neal
The Vision.....Amy Frank
Olga Borowska, Lucille Moore, Amy Rivere
(Staged by Senia Gluck)

Scene 6—The New Scene—Comedy Sketch

The Hero.....Don Barclay
The Heroine.....Margaret Davies
The Director.....Harry Burns
The Villain.....Charles Callahan

Scene 7—The Silver Garden

"The Band Plays Home, Sweet Home".....L. Barton Evans and Dorothy Knapp
"Pretty Peggy".....Peggy Joyce
Assisted by her Collegians

Scene 8

Travesty.....Don Barclay
Harry Burns, Charles Senna, Al Thomas, Charles Callahan, Al Clair

Scene 9

Vocal Selection.....J. Frank Leslie

Scene 10

"Cretonne Girl".....John Byam
Assisted by Margaret Davies and Cretonne Girls

Scene 11—Joe Cook, The Humorist
(Presenting a portion of his "One Man Vaudeville Show")

Scene 12—The Slave Mart
(Conceived and Arranged by Renoff)

Premiere Danseuse.....Renova
Violet Bristow, Olga Borowska, Jean Watson, Elsie Neal and Corps de Ballet
The Slave Dealer.....Renoff

Scene 13—Finale of the Furs

"When the Snowflakes Fall".....John Byam
Snow Dears.....Margaret Davies and Claire Elgin
Dance of the Snowballs.....
.....Vanities Dancing Girls
Baby Lamb.....Cardinal Pearls
Baby Lambs...(From Left to Right)
Misses O'Reilly, Cheeke, Lux, Brown
Squirrel.....Carlena Diamond
Squirrels.....(From Left to Right)
Misses Butler, Gillingham, Parker, Latham
Mole.....Dorothy Knapp
Moles.....(From Left to Right)
Misses Jackson, Patterson, Washburn, Miller
Seal.....Claire Elgin
Seals.....(From Left to Right)
Misses Borrows, Hyde, Harrisson, Palmer
Sable.....Margaret Davies
Sables.....(From Left to Right)
Misses Carr, Powell, King, Greenwalt
Ermine.....Ruth Oswald
Ermines.....(From Left to Right)
Misses Black, DeLorez, Fitch, Larson
Chinchilla, "Queen of All".....
.....Peggy Joyce

Characteristic poses of Earl Carroll (ight and left), young owner and producer of "Vanities," the first act of which will be broadcast from KYW, April 22.

Claire Elgin, below, feature dancer with Earl Carroll's "Vanities," whose dancing will NOT be heard.

Ruth Oswald, below, is prima donna in Earl Carroll's "Vanities."

Wednesday, April 16

(Continued from page 15)

Hotel, Joska DeBabary's Orchestra, Clyde Doerr's Orchestra; 8:00, Radio surprise, Morgan L. Eastman; Sammy Stewart and hts Knights of Syncopation; 9:05, Program, Unton Trust Co.; 9:15, Talk, auspices of the Federal Health Bureau; 10:00-2:00 a. m., Midnight revue, W. Remington Welch, organist; Herbie Mintz, piantst.

WBAH, Minneapolis, Minn. (Central, 417), 12:30-1:30 p. m., Dick Long's Trio; Mrs. A. B. May, reader; 7:00-7:30 p. m., Lectures program, Dr. J. W. Holland.

WBAP, Fort Worth, Tex. (Central, 476), 7:30-8:30 p. m., Concert, Sam S. Losh, baritone; 9:30-10:45, Concert, George Freeman's Sooner Serenaders.

WBAV, Columbus, Ohio (Eastern, 390), 12:00 m., Piano music, Ila Lorbach Owens.

WBZ, Springfield, Mass. (Eastern, 337), 6:00 p. m., Dinner concert, WBZ String Orchestra; 7:00, "Medical Section of the Organized Reserves," Major Charles A. Thuis; 7:30, Bedtime story for the kiddies; 7:40, Chamber music, WBZ String Orchestra; Mrs. Dorothea Waite, soprano; 8:30, Meeting of the National Republican Club.

WCAE, Pittsburgh, Pa. (Eastern, 462), 3:30 p. m., Piano recital, Fred Rosenfeld; 4:30, Uncle "Kaybee;" 6:30, Dinner concert, William Penn Hotel; 7:30, Sunshine Girl; 7:45, Theatrical review; 8:30, Musical program.

WCX, Detroit, Mich. (Eastern, 517), 4:00 p. m., Music; 6:00, Dinner concert, Hotel Tuller; 8:00, Music, Dolores Hackett.

WOAF, Kansas City, Mo., Star (Central, 411), 3:30-4:30 p. m., Musical matinee, Johnnie Campbell's Kansas City Club Orchestra; 6:00-7:00, School of the Air; Piano tuning-in number, Duo-Art; Address, speaker, Health Conservation Association; Tell-Me-a-Story Lady; Fritz Hanleln's Trianon Ensemble; 8:00-9:15, Program by the studenta of the Kansas City (Kan.) University Fine Arts Department; 11:45 p. m.-1:00 a. m., Nighthawk frolic, "Merry Old Chief" and Coon-Sanders Orchestra.

WDAP, Chicago, Ill. (Central, 360), 7:00-8:30 p. m., Drake Ensemble and Blackstone Quintet; 10:00, John Stamford, Ralph Emerson, organist; Jack Chapman Orchestra.

WDAR, Philadelphia, Pa. (Eastern, 395), 11:45 a. m., Daily Almanac; 12:02, Organ recital, Stanley Theater; Dinner music, Arcadta Cafe Concert Orchestra; 2:00, Arcadia Cafe Concert Orchestra; 4:30, Mah Jong Lessons, Evelyn Merrihew; 7:30, Dream Daddy's bedtime stories; 8:00, Arcadia Cafe Concert Orchestra; 8:30, "Care of Children." Mrs. Louis Love; 10:10, Howard Lanin's Arcadia Cafe Dance Orchestra.

WEAF, New York, N. Y. (Eastern, 492), 11:00 a. m., Mabel Empie, soprano; 11:15, John Martin; 11:30, New York Tuberculosis Society; 12:00 m., Lenten church services; 4:00 p. m., Montmartre Orchestra; 5:00, Talk by Mary Paddon; 5:15, John H. Eckles, tenor, and Blanche Eckles, soprano; 7:00, Synagogue services; 7:30, Thornton Fisher; 7:50, American Agriculturist; 8:00, Columbia University; 8:20, Marjorie Horton Haskell, soprano, and Paul Haskell, tenor; 8:50, Program by Greeting Card Association; 9:00, [illegible] program; 10:00, Salvation Army Band.

WEAO, Columbus, Ohio (Eastern, 360), 4:00 p. m., Agricultural lecture, Ohio State University faculty member; Musical program.

WFAA, Dallas, Texas (Central 476), 12:30-1:00 p. m., Musical recital, the Red-Headed Girl of the Journal.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Meyer Davis Bellevue Stratford Concert Orchestra; 3:00, March, Junior High School Orchestra of Easton, Pa., A. J. Fregans, director; 6:00, Sunny Jim's bedtime stories; 6:30, Meyer Davis Bellevue Stratford Concert Orchestra.

WGI, Medford Hillside, Mass. (Eastern, 360), 12:00 m., Selection on the Ampico in Chickering; Chat with ladies, Marjorie Drew; Selections on Brunswick; 7:00 p. m., Meeting of the Amrad Big Brother Club; Message to Camp Fire Girls, Chas. W. Casson, "Big Smoke;" 7:30, Concert, Revere High School Orchestra.

WGR, Buffalo, N. Y. (Eastern), 319), 12:30-1:00 p. m., George Albert Bouchard, organist; 2:30-4:00, The Radio Dealers musical program; 6:30-7:30 and 11:30, Vincent Lopez Hotel Statler Orchestra; 8:50, Address, "Swindler," John N. Garver, secretary, Buffalo Better Business Commission; 9:00, Concert, direction Edgar Messersmith.

WGY, Schenectady, N. Y. (Eastern, 380), 6:30 p. m., "Adventure Story," Youth's Companion.

WHA, Madison, Wis. (Central, 360), 7:30 p. m., "Better Times with More Alfalfa," Prof. L. H. Graber.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Walnut Theater Orchestra; 7:30-9:00, Mrs. Emory Nold, soprano; Reading, Gordon B. Seppenfield; Martin H. Berger, tenor; Mrs. Thomas D. Herrick, accompanist; Agricultural tabloid talk, faculty of the State Agricultural College; Frank Holland, tenor.

WHB, Kansas City, Mo., Sweeney School (Central, 411), 12:35-1:00 p. m., Popular music, Sweeney Radio Orchestra; 2:00-3:00, Ladies' hour program, Sweeney Radio Orchestra; 3 p. m., Weather and market information; 7:00-8:00, Sweeney Radio Orchestra.

WIP, Philadelphia, Pa. (Eastern, 509), 1:00 p. m., Gimbel Brothers Tea Room Orchestra, Ray Steen, director; 6:05, St. James Hotel Dinner Dance Orchestra; 7:00, Uncle Wip's bedtime stories.

WJZ, New York, N. Y. (Eastern, 455), 12:00 m., Lenten service, Trinity Church, Rev. Charles Fiske; 1:00 p. m., Nantze's Schraff's Tea Room Orchestra; 2:00, New York Board of Education; 3:00, Landau and His Harbor Inn Serenaders; 4:00, Elinor Gunn's lashion talk; 4:10, "Peeps at People," Edythe H. Browne; 4:20, "Interior Decorating," Good Housekeeping; 4:30, Tea concert, Hotel Commodore; 5:30, Lecture, Dr. Herman H. Horne; 7:00, Story Book Lady; 7:30, Dance program, Irving Selzer and his Cafe Boulevard Orchestra; 7:45, The Progress of the World, a Review of Reviews talk; 8:00, Dance program, Irving Selzer and his Cafe Boulevard Orchestra; 8:30, "The City Record," Hon. Peter J. Brady; 8:45, Marian Christian, soprano; Clinton Sommer, pianist; 9:00, "Romantic Castles of Europe," Wert Barnitz; 9:15, Wallace J. Drewes, pianist; 9:30, New York University Glee Club; 10:30, Dance program, Enid Coleman's Trocadero Orchestra.

WLAG, Minneapolis-St. Paul, Minn. (Central, 417), 10:45-11:15 a. m., Household hints; 11:35-12:00 m., Surprise hour; 2:00-2:30 p. m., "Dressmaking," Mme. Myrtle Saperston; "Hairdressing," Maude Hart; 2:40-4:00 p. m., Daylight concert; 4:00-4:30, Magazine reading; 5:30-6:00, Children's stories, Mrs. Robert Cargill; 6:00-6:30, Sport hour, "Construction and Purpose of Signs," E. R. Kelley; "Cleanup Week Talk;" 7:30-8:15, Farm lectures, "Came to Scoff, but Remained to Spray," A. G. Ruggles; "Making Minnesota Blossom," Mrs. John Howard Todd; "Feeding Baby Chicks," E. H. Smith; 9:15, Business message; 9:30, Musical program, Exchange Club of St. Paul; 10:45, Casino Orchestra from St. Paul Hotel, Sam Heiman, director.

WLW, Cincinnati, Ohio (Central, 309), 4:00 p. m., Program for the Shut-Ins," Wurlitzer Concert Company; 7:15, Selections from "If Wishes Were Horses," musical play, Junior Show Shop Players; 8:00, "All About Stamp Collecting," E. B. Power; 8:15, Choir concert, "The Crucifixion," Choirs of St. Mark's Evangelical Church and Plymouth Congregational Church; 8:45, "Medicine in the Days of King Tutankhamen," Dr. Caswell A. Mayo; 9:00, Warner and Swone Coon Dog Orchestra.

WMAQ, Chicago, Ill. (Central, 447.5), 1:00 p. m., Speeches, Chicago Association of Commerce; 2:35, Lyon & Healy program; 4:20, Items of Interest to women; 4:30, Pupils Cosmopolitan School of Music; 7:00, Stories for the children, Georgene Faulkner, story lady; 7:30, Weekly lecture from Northwestern University; 8:40, La Salle Hotel Orchestra; 9:00, Talks, various Chicago charities; 9:15, Program, Florence Nelson, soprano.

WOC, Davenport, Iowa (Central, 484), 12:00 m., Chimes concert; 3:30 p. m., Lecture, C. A. Russell; 6:30, Sandman's visit; 8:30, Musicale, Erwin Swindell, musical director; Fern Dameron, soprano; Paul Ochel-tree, tenor; Margaret O'Donnell, soprano; Haut Deth-lefs, violin-concertina.

WOO, Philadelphia, Pa. (Eastern, 509), 11:00 a. m., Organ recital, Mary E. Vogt; 12:02 p. m., Wanamaker Crystal Tea Room Orchestra, Robert E. Golden, director; 4:45, Organ recital, Mary E. Vogt; 7:30, Havana Casino Orchestra from Sylvania Hotel, Vincent Rizzo, director; 8:15, Organ recital, Mary E. Vogt; 9:00, WOO Orchestra, Robert E. Golden, director; 10:02, Kentucky Kernals Dance Orchestra from Adelphia Hotel.

WOQ, Kansas City, Mo. (Central, 360), 7:00-8:00 p. m., Edison Recreation program.

WOS, Jefferson City, Mo. (Central, 440.9), 8:00 p. m., "Should Missouri Farmers Fertilize the Corn Crop?" M. F. Miller; 8:20, Barn dance program, Bill Caton, old-time colored fiddler; his partner, Ola Gathright, guitarist.

WTAM, Cleveland, Ohio (Eastern, 390), 3:00 p. m., Musical selections and Easter Chimes, WTAM Symphony Orchestra; Easter story reading, Alleth Willard; Solo, Dick Finnegan, boy soprano; Trio, Nell Steck, harpist, Ben Silverburg, violin, Max Schmitt, cello; Solo, Edna Dunham Willard, soprano; Reading, "The Story of the Cross," L. W. Zimmerman; solo, Edna Dunham Willard, soprano; Address, Right Rev. Frank DuMoulin, Bishop Coadjutor of Ohio; Harp solo, Nell Steck; Solo, Arthur M. Parry, baritone; Solo, Florence Wasson; Trio, Nell Steck, harpist, Ben Silverburg, violin, Max Schmitt, cello; Solos, Florence Wasson and Arthur Parry.

WWJ, Detroit, Mich. (Eastern, 517), 8:00 a. m., Setting-up exercises, R. J. Horton; 12:00 m., Goldkette's Orchestra; 3:00 p. m., News Orchestra; 7:00, Newsboys' Band, Jackson, Mich.; Vocal selections, pupils of Blanch Bliss Lyons.

Thursday, April 17

CKAC, Montreal, Canada (Eastern, 425), 4:00 p. m., Weather, stock, news, music; 8:30, Canadian National Railway Artists; Talk, official.

KOKA, E. Pittsburgh, Pa. (Eastern, 326), 12:20 p. m., Lenten services, Trinity church; 5:30, "The Forgtveness of Sins," Rev. Hugh T. Kerr; 6:15, Dinner concert, KDKA Little Symphony Orchestra; 7:30, Wendall Hall; 8:00, Farm program; 8:30, "The Seven Last Words," Choir Ensemble Society; 11:30, Concert.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., Y. M. C. A., concert and sales lecture; 8:00-9:00, Ambassador Hotel concert; 9:00-10:00, Examtner concert; 10:00-11:00, Concert presented by Celeste Rhyas, pianist.

KFKB, Millord, Kansas (Central, 286), 8:05 p. m., "What Shall the Baby Wear?" Mary Worcester; 8:30, "Line and Form," Prof. Araminta Holman; Thelma Coffin, pianist; Vocal solos, Sheldon Storer; Dorothy Hall, vtolinist.

KFSG, Los Angeles, Calif. (Pacific, 278), 3:30-4:30 p. m., Organ recital through courtesy of Prof. Wm. J. Kraft, Jean de Chauvent, B. E. Ballard and others; 6:30-7:00, Children's hour, Bible stories; 8:00-8:25, Boy talks, by Thos. B. Brown, Boy Scout commander; 9:15, Revival service, conducted by Almee Semple McPherson; 9:15-10:00, Special program presented by students of the Echo Park Evangelistic and Missionary Training Institute and the Angelus Temple choir of sixty voices; 10:02-10:10, The family altar and prayer; The Angelus Temple chtmes.

KGO, Oakland, Calif. (Pacific, 312), 8:00 p. m., Bohemian Trio; East Bay Serenaders, Walter H. Bundy, director; Mrs. A. W. Lawson, soprano; Euphonium solo, George M. Flint; Joseph Kearns, bass; Mrs. Adnee Hall, soprano; J. Carlton Hollenbeck, pianist; Irwin Johnson, baritone; Readings, Dorothy Boardman.

KGW, Portland, Ore. (Pacific, 492), 12:30 p. m., Concert; 3:30, Woman's story program; 8:00, Accordion solos, Johnny Sylvester; 8:15, Studio program of dance music, George Olsen's Metropolitan Orchestra; 10:00, Dance music, George Olsen's Metropolitan Orchestra.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Program presenting Dorothy Bell Robinson, Hawaiian guitar; Edward Murphey, basso balladist; 2:30-3:30, Program through courtesy of Barker Brothers; 6:45-7:30, Children's program, presenting Jane Adele Riley, reader, age 5 years; Virginia Eberle, pianist, age 10 years; Nancy Parent, pianist, 13 years; Katherine Girard, soprano, age 11 years; Rita Cummings, soprano, age 12 years.

KPO, San Francisco, Calif. (Pacific, 423), 1:00-2:00 p. m., Rudy Seiger's Fairmont Hotel Orchestra; 2:30-3:30, Matinee program, Mme. Martha Fawkes-Haun, reader; Mme. Gilbert Moyle, pianist; 4:30-5:30, Rudy Seiger's Fairmont Hotel Orchestra; 5:30-6:30, Children's hour stories, "Big Brother" of KPO, Book of Knowledge; 7:00-7:30, Rudy Seiger's Fairmont Hotel Orchestra; 8:00-9:00, Organ recital, Theodore J. Irwin; 9:00-10:00, Program by the Cap and Bells, Mabel Radki, coutralto; Mrs. Clyde N. White, accompanist; John Afendras, violinist; Helen O'Neal, accompanist; 10:00-11:00, E. Max Bradfield's Versatile Band.

KYW, Chicago, Ill. (Central, 536), 11:35 a. m., Table talk, Mrs. Anna J. Peterson; 6:45 p. m., Children's bedttme story, "Uncle Bob;" 7:00, Dinner concert, Joska DeBabary's Orchestra, Clyde Doerr's Orchestra; 7:35, Sport talk, Leo Fisher; 8:00, Twenty minutes of good reading, Rev. C. J. Pernin; 8:20, Whiting Community Choral, Morgan L. Eastman, conductor; John Stamford, tenor; Dorothy Wilkins, soprano; Sallie Menkes, pianist; Thora Martens, contralto.

WAAW, Omaha, Neb. (Central, 360), 8:00 p. m., Talk, W. J. Martin; Sunday school lesson, Rev. E. M. Brown.

WBAH, Minneapolis, Minn. (Central, 417), 12:30-1:30 p. m., Dick Long's Trio; Mabel Hedquist, pianist; 9:30-11:00 p. m., Passover Feast services—"First Passover Talk," Rabbi C. David Matt; Marion Bearnstein Bearman, violinist; Louise Lupien Jenkins, accompanist; Cantor Eli Kreidberg, soloist; Adelline Wagner, soprano; Mrs. Louise Himmelman, accompanist; auspices United Synagogues of America.

WBAP, Fort Worth, Texas (Central, 476), 7:30-8:30 p. m., Concert, old-time fiddlers of Strawn, E. L. Tucker, director; 9:30-10:45, Owen Crockett's Yeomen Orchestra.

WBAV, Columbus, Ohio (Eastern, 390), 12:00 m., religious service, Dr. S. S. Palmer, pastor Broad Street Presbyterian Church, speaker; sacred music; news.

WBZ, Springfield, Mass. (Eastern, 337), 7:00 p. m., Music talk, Robert Elisha Stanley Olmsted, Musical formas; The Suite; Sonata and Symphonic Treatment; 7:30, Bedtime story for the kiddies; 7:40, Concert, Spencer Terry, baritone; Mrs. Spencer Terry, soprano; 8:30, Meeting of the Publicity Club; 9:00, Concert, Massachusetts Institute of Technology.

WCAE, Pittsburgh, Pa. (Eastern, 462), 4:30 p. m., The Sunshine Girl; 6:30, Dinner concert, William Penn Hotel; 7:30, Uncle "Kaybee;" 7:50, Travel talk, Rev. Clyde L. Nevins; 8:30, Musical program.

WCBO, Zion, Ill. (Central, 345), 8:00 p. m., Mixed quartet; Euphonium solo, William C. Dunn; Glenn R. Sparrow, tenor; Reading, Mrs. Blanche R. Kesler; Song Bells solos, George Beem; Mrs. Mayfield, soprano; Tenor and baritone duet, G. R. Sparrow, J. L. Bishop; John Mehaffey, ptanist; Florence Farrar contralto.

WCX, Detroit, Mich. (Eastern, 517), 2:20 p. m., Sunday School Lesson, Rev. Glenn Atkins; 4:15, Music; 6.00, Dinner concert, Hotel Tuller; 8:30, Ford Band, Acadia auditorium.

WOAF, Kansas City, Mo., Star (Central, 411), 3:30-4:30 p. m., Musical matinee, D. Ambert Haley Orchestra; 6:00-7:00, School of the Air; Piano tuning-in number, Duo-Art; Address, speaker from William Jewell College, Liberty, Mo.; Reading, Miss Cecile Burton; Tell-Me-a-Story Lady; Fritz Hanlein's Trianon Ensemble; 11:45 p. m.-1 a. m., Nighthawk Frolic, "Merry Old Chief" and the Coon-Sanders Orchestra.

WDAP, Chicago, Ill. (Central, 360), 7:00-8:00 p. m., Drake Ensemble and Blackstone Quintet; 8:00-8:30, Ralph Emerson, organist; 10:00, Tom Mallee, Jack Little, Jack Chapman's Orchestra.

WDAR, Philadelphia, Pa. (Eastern, 395), 11:45 a. m., Daily Almanac; 12:02, Organ recital, Stanley Theater; Arcadia Cafe Concert Orchestra; 2:00, Arcadia Cafe Concert Orchestra; 4:30, Omicron Chapter of Mu Phi Sorority; Helen Merryman, contralto; Arline Smith, accompanist; 7:30, Dream Daddy's bed time stories.

WEAF, New York, N. Y. (Eastern, 492), 11:30, Talk on "Oren Control"; 12:00 noon, Lenten church services; 4:00 p. m., George Keane, baritone; 4:15, Frances Kirsch, soprano; 4:45, Billy Wynne and his orchestra; 7:00, N. Y. Fed. of Churches; 7:30, Thornton Fisher;

FROM KYW TUESDAY, APRIL 22

Pretty Peggy Joyce, below, and humorous Joe Cook, right, stars of "Vanities." Pretty Peggy is wearing her famous chinchilla robe and a MILLION dollars worth of jewels.

7:40, Vee Lawnhurst, pianist; 8:00, "How to Plant the Home Grounds"; 8:20, Bank of America; 8:30, Hunter College musical program; 9:20, Oratorio Society of Christian Science Inst.; 10:30, Sarah Edwards, contralto; 11:00, Vincent Lopez Orchestra.

WEAO, Columbus, Ohio (Eastern, 360), 8:00 p. m., Talk, "Home Reading Courses by College of Agriculture," J. E. McClintock; Concert, Columbus Grand Opera Company.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., "Dallas in Old Days and Dallas Up to Date," Epps G. Knight; 6:30-9:30, Musical recital, Ella Stegall Williams and assisting musicians; 6:45-7:00, Boy Scout program; 11:00-12:00, Musical recital, Circle Theatre Orchestra.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Meyer Davis Bellevue Stratford Concert Orchestra; 3:00, Loretta Kerk, pianist; 6:05, Sunny Jim's bedtime stories; 6:30, Meyer Davis Bellevue Stratford Concert Orchestra; 7:00, "Weymann Five" Orchestra; 8:00, Boy Scouts Radio meeting; 10:10, Charlie Kerr and his Symphonic Dance Orchestra.

WGI, Medford Hillside, Mass. (Eastern, 360), 12:00 m., Selection on Ampico in Chickering; Chat with Ladies, Marjorie Drew; Selections on Brunswick; 7:00 p. m., Meeting of the Amrad Big Brother Club; 7:30, Musicale, popular song hits.

WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1:00 p. m., George Albert Bouchard, organist; 2:30-4:00, The Radio Dealers' Musical program; 6:00-7:30, Chamber music recital, featuring Ann Joseffer, violinist.

WGY, Schenectady, N. Y. (Eastern, 380), 2:00 p. m., "Spring House Cleaning," Mrs. Edward P. Pressey; 6:30, Dinner music, Romano's Orchestra; 7:45, Radio drama, "Passers By," WGY Players; A Few Moments with New Books, William Jacoh; WGY Players.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Walnut Theater Orchestra; 7:30-9:00, Ella Sharrard Violin Quartette; Four-minute digest of International Sunday School lesson; Four-minute Radio Forum talk.

WHB, Kansas City, Mo., Sweeney School (Central, 411), 12:35-1:00 p. m., Popular program, Sweeney Radio Orchestra; 2:00-3:00, Ladies' hour program, Sweeney Radio Orchestra; 3:00 p. m., Weather and market information; 7:00-7:45, Solos by members Sweeney Radio Orchestra; 8:00-10:00, Program of vocal and instrumental solos interspersed by selections, Sweeney Radio Orchestra.

WIP, Philadelphia, Pa. (Eastern, 509), 1:00 p. m., Gimbel Brothers Tea Room Orchestra; Ray Steen, director; 3:00, Program for Two Pianos. Pearl Heehner and Emily Sellers; Grace H. Taylor, elocutionist; 6:05, Harold Leonard's Redjackets from Club Madrid; 7:00, Uncle Wip's bedtime stories; 8:00, Philadelphia composer recital; 9:30, "Timely Talks to Motorists" by Eugene Hogle, of Automobile Club of Philadelphia; Philadelphia Music Pageant, Fullerton L. Waldo; 10:05, Radio Vocal Lesson by Herbert Wilbur Greene; 11:15, Ted Weems and his Cafe L'Aiglon Orchestra.

WJAX, Cleveland, Ohio (Eastern, 390), 8:00 p. m., Concert, Hotel Cleveland Orchestra. Ivan Franclsci, director; Piano solo, Mrs. R. A. Carle; Violin solo, Mrs. Frederic M. Nicolaus; Songs and ballads, Viola Miller, sololst; Monologs, Messers. W. N. Rossington, A. E. Pill and Jimmy Hindson; Solos, Jimmy Hindson; A. E. Pill, baritone; W. N. Rossington; Scraps, Messers. Rossington, Pill and Hindaon.

WJY, New York, N. Y. (Eastern, 405), 7:30 p. m., "Food Supply and Distrihution to Greater New York," William T. Donnelly; 7:45, Josephine Evans, soprano; 8:05, "Golf," Innis Brown; 8:20, Sterling Male Quartet; 8:45, "South American Jungles at Night," Harold E. Anthony; 9:00, The White Way Trio; 9:30, Ralph L. Grosvenor, baritone; 10:00, Montague Newman, violinist; Mrs. J. W. Anderson, soprano; 10:40, J. Vincent Moore Entertainers.

WJZ, New York, N. Y. (Eastern, .455), 12:00 m., Lenten service, Trinity Church, Rev. Charles Fiske, minister; 1:00 p. m., Pennsylvania Concert Orchestra; 2:00, New York Board of Education; 3:00, Afternoon Auditorium concert, Wanamaker Auditorium; 4:00, Elinor Gunn's Fashion talk; 4:10, "Joys of Collaboration," Harriet Ford; 4:20, "Food for the Middle Years," Winifred S. Gibbs; 4:30, "Fashions," Harper's Bazaar; 4:45, Ella Schreiber, soprano; 5:00, Regalhuto Sisters, pianists; 5:15, Ella Schreiber, soprano; 7:00, Uncle Dave Cory's "Jack Rabblt Stories"; 7:30, Time's "Top Question Game"; 7:45, Emily V. Ebert, soprano; 8:00, "Socialism," Dr. Henry P. Fairchild; 8:30, Wanamaker organ recital, Wanamaker Auditorium; 9:15, At Home with J. Andrew White and his guest, O. O. MacIntyre; 9:30, Bordentown Male Quartet; 10:30, Dance program, Theodore's Hotel Majestic Orchestra.

WLAG, Minneapolis-St. Paul, Minn. (Central, 417), 10:45-11:15 a. m., Household hints; 11:35-12:00 m., Surprise hour; 2:00-2:30 p. m., "Forty Wiggles," Tess Cooperman; 2:40-4:00, Daylight concert; 4:00-4:30, Magazine reading; 5:30-6:00, Children's stories, Ellen Nye; 6:00-6:15, "Health Exposltions," Dr. John M. Lajoie; 6:15-7:00, Dinner concert, Traffic Club Orchestra; 7:30-8:15, Farm lectures, "Has Drainage Been Overdone," Dalton G. Miller.

WLW, Cincinnati, Ohio (Central, 309), 4:00 p. m., Adelalde Apfel, pianist; 10:00, Concert, Junior faculty, Cincinnatl Conservatory, Mrs. Sayler Wright, vocalist; Songs, Corrinne M. Lawson; Mrs. Jemmie Vardeman, pianist; Reading, "Sundried," Margaret L. Spaulding; Duet, Mrs. Wright, Mrs. Phau; Heiman Weinstein, violinst; Songs, Mrs. Mary Towsley Phau; 11:00, Doherty's Melody Boys.

WMAQ, Chicago, Ill. (Central, 447.5), 4:20 p. m., Items of interest to women; 4:30, Illinois Federation of Women's Clubs; 7:00, Boy Scouts' weekly talk; Talk, Rockwell R. Stephens; Humorous readings, Golda Brant; 8:40, La Salle Orchestra; 9:00, Lecture from U. of Chicago; 9:15, Program.

WMC, Memphis, Tenn. (Central, 500), 8:30 p. m., Chisca Hotel Philharmonic Orchestra.

WOAW, Omaha, Neb. (Central, 526), 6:00 p. m., Child's story hour, Grace Sorenson; 6:30, Goldenrod nrchestra, Wallace Johnston, manager; 9:00, Regular monthly meeting of World Radio Camp, E. E. May; 9:30, Musical program, Kiwanls club; "Kiwanls," F. O. Rutledge; Dr. J. D. Bellamy, tenor; Mrs. F. M. Carpenter, violinist; Vocalist, Mrs. Helen Crone; Vocalist, Jim Ahlgren; W. W. Benedict, pianist; "The Sunny Side of Life," Rev. H. H. Pittman; Quartet; Vocalist, Mrs. E. E. May; "Our National Anthem," E. R. Ferguson.

WOC, Davenport, Iowa (Central, 484), 12:00 m., Chimes concert; 3:00 p. m., "Hypochlorhydria," Karl G. Stephan; 5:45, Chimes Concert; 6:30, Sandman's Visit; 9:00, Orchestra program, The Palmer School Radio Orchestra, Erwin Swindell, conductor.

WOO, Philadelphia, Pa. (Eastern, 509), 11:00 a. m., Organ recital, Mary E. Vogt; 12:02 p. m., Wanamaker Crystal Tea Room Orchestra, Robert E. Golden, director; 4:45, Organ recital, Mary E. Vogt.

WOQ, Kansas City, Mo., Western Radio Co. (Central, 360), 7:00-8:00 p. m., Edison Recreation program, Agriograms and information talks; 8:00-10:00, Regular Benzo Gaa Co. program.

WRC, Washington, D. C. (Eastern, 469), 6:00 p. m., Children's hour, Peggy Alhion; 7:45, Talk on motoring, auspices of the American Automobile Association; 8:00, Dance program, Better Ole Orchestra; 8:45, Song recital, Raymond G. Moore, haritone; 9:00, Lillian Harmon Burke, pianist; 9:15, The Lee House Trio; 9:30, Easter Oratorio, "The Atonement," R. Dean Shure, Choir of the Mount Vernon Place M. E. Church.

WWJ, Detroit, Mich. (Eastern, 517), 8:00 a. m., Setting-up exercises, R. J. Horton; 12:00 m., Edward Barnes, haritone; LeRoy DeTurk, tenor; 3:00 p. m., News Orchestra; 5:00, Basehall scores; 7:00, News Orchestra; William Baggott, pianist and baritone; Edwin Baggott, haritone; Richard Baggott, tenor; Jack Baggott, bass; 10:00, Goldkette's Orchestra.

Friday, April 18

KDKA, E. Pittsburgh, Pa. (Eastern, 326), 12:20 p. m., Good Friday services, Rev. Percy G. Kammerer, Trinity Church; 5:30, "The Life Everlasting," Rev. Hugh T. Kerr; 6:15, Organ recital. Cameo Motion Picture Theater; 7:15, Sunday School lesson, Dr. R. L. Lanning; 7:30, Wendell Hall; 8:00, Good Friday services, First Baptist Church, Rev. Carl Wallace Petty; 9:15, Concert, Mrs. James H. Green, director; Christine Adams, cellist.

KFAE, Pullman, Wash. (Pacific, 330), 7:30 p. m., "The Growth of International Interdependence," Prof. F. R. Yoder; "Alfalfa in Rotation with Wheat Benefited by Gypsum," Prof. R. P. Cope; "Value of a Milk Campaign," Mary Sutherland; Varsity Quartet; Song hits, Fred Marshall; Book chat, Alice L. Webb.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., Vocal and instrumental concert; 8:00-9:00, Evening Herald concert; 9:00-10:00, Examiner concert; 10:00-11:00, Concert of vocal and instrumental numbers arranged by Harry Porter; 11:00-12:00, Concert by the Ambassador-Max Fischer Cocoanut Grove Orchestra.

KFKB, Milford, Kansas (Central, 286), 8:05 p. m., "Kansas Roads," Prof. C. H. Scholer; 8:30, "Problems in Rural Electrification," Prof. J. L. Brenneman; Elsie H. Smith, pianist; Vocalist, Prof. Ira Pratt; Robert Gordon, cellist.

KFOA, Seattle, Wash. (Pacific, 455), 8:30 p. m., Leo Feist night, a program of late song hits of the Leo Feist Puhlishing Company, arranged by Lew Mahan.

KFSG, Los Angeles, Calif. (Pacific, 278), 3:30-4:30 p. m., Special musical program under direction of Gladwyn N. Nichols; 6:30-7:00, Children's hour; International Sunday School lesson for April 20th, reviewed by Mrs. M. Kennedy; 8:00-9:15, Revival services by Aimee Semplo McPherson; 9:15-10:00, Concert program by the Angelus Temple Band and Crusaders; 10:02-10:10, Family altar, prayer and Chimes.

KGW, Portland, Ore. (Pacific, 492), 12:30 p. m., Program, Peck Holton's Orchestra; 3:30, Lecture, Father B. Colley; 8:00, Lecture, Extension Division of University of Oregon; 10:30, Hoot Owls.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Program presenting the Farrar Sisters, Captalu W. F. Cannon of the Los Angeles Motor Patrol; 2:30-3:30, Program presented through courtesy of Barker Brothers; 6:45-7:00, Children's program presenting Kathryn Stillwell, mezzo-soprano; The weekly visit of Richard Headrick, screen juvenile; 7:00-7:30, Organ recital from First Methodist Episcopal Church, Arthur Blakeley, organist; 8:00-10:00, Program presented through courtesy of the Wiley B. Allen Music Company; Studebaker Radio Orchestra of Long Beach, Calif.

KLX, Oakland, Calif. (Pacific, 509), 8:00-10:00 p. m., KLX Concert Trio; Vocal solos, Mme. Dorothy Raegan Talbot; Harriet French, violinist; Joziena Vander Ende, cellist; Original Serenaders.

KLZ, Denver, Colo. (Mountain, 360), 7:30 p. m., "Denver Climate," J. M. Schierer, meteorologist.

KPO, San Francisco, Calif. (Pacific, 423), 1:00-2:00 p. m., Rudy Seiger's Fairmont Hotel Orchestra; 2:30-3:30, Organ recital, Theodore J. Irwin; 4:30-5:30, Rudy Seiger's Fairmont Hotel Orchestra.

KSD, St. Louis, Mo. (Central, 546), 12:00 m., Good Friday "Tre Ore" service, Church of St. Francis Xavier; 8:00, "Seven Last Words of Jesus," Mercadente, Christ Church Cathedral.

KYW, Chicago, Ill. (Central, 536), 11:35 a. m., Table talk, Mrs. Anna J. Peterson; 6:00 p. m., Spanish leasons, Prof. A. A. Braachi; 6:45, Children's bedtime story, "Uncle Bob," Dinner concert, Congress Hotel, Joska DeBabary's Orchestra; Clyde Doerr's Orchestra; 10:00-2:00 a. m., Midnight revue, W. Remington Welch, organist.

WAAW, Omaha, Neb. (Central, 360), 8:00 p. m., Bridge talk, Mrs. Guy Purdue; 8:25, Special Good Friday service, First Lutheran church, Rev. W. A. Siebert, pastor.

WBAH, Minneapolis, Minn. (Central, 417), 12:30-1:30 p. m., Dick Long's Trio and soloist; 7:00-7:30 p. m., Pierrot and Plerette Review.

WBAP, Fort Worth, Texas (Central, 476), 7:30-8:30 p. m., Concert, Junior Euterpean Club; 9:30-10:45, Concert, artists of Texas Christian University.

WBAV, Columbus, Ohio (Eastern, 390), 12:00 m., Plann music, Ila Lorbach Owens; News; 8:00 p. m., Dispatch Little Symphony Orchestra; Miss Marcella Hartman, soprano.

WBZ, Springfield, Mass. (Eastern, 337), 6:00 p. m., Dinner concert, WBZ Orchestra; 7:00, Dramatized story, Youth's Companion; Current book review, R. A. MacDonald; 7:30, Bedtime atory for the Kiddies; 7:40, Vesper services, Boston Herald-Traveler; 11:00, Program, Chamber music, WBZ Orchestra; Mrs. Harry G. Kitson, soprano.

WCAE, Pittsburgh, Pa. (Eastern, 462), 4:30 p. m., Sunshine Girl and Uncle Kaybee; 6:30, Dinner concert, William Penn Hotel; 7:30, Uncle Kaybee; 8:30, Musical program, William Fogerty, bsritone; Mrs. C. A. Kinnard, soprano.

WCAL, Northfield, Minn. (Central, 360), 8:30 p. m., "Rereading the Ancient Classics," Dr. George Welda Spohn.

WCX, Detroit, Mich. (Eastern, 517), 4:15 p. m., Music; 6:00, Dinner concert, Hotel Tuller; 8:30, Special Good Friday program.

WDAF, Kansas City, Mo., Star (Central, 411), 3:30-4:30 p. m., Musical matinee, Leo R. Davis "Request" Orchestra; 6:00-7:00, School of the Air; Piano tuning-in number, Duo-Art; Address, speaker, Kansas City Children's Bureau; Tell-Me-a-Story Lady; Fritz Hanlein's Trianon Ensemble, 8:00-9:15, Program of old-time songs arranged and presented by O. J. Ochs; 11:45 p. m.-1 a. m., Nighthawk Frolic. "The Merry Old Chief" and the Coon-Sanders Orchestra.

WDAP, Chicago, Ill. (Central, 360), 7:00-8:30 p. m., Drake Ensemble and Blackstone Quintet; 10:00, Cambridge Sisters, William Benson, Ralph Emerson, organist; Jack Chapman's Orchestra.

WDAR, Philadelphia, Pa. (Eastern, 395), 11:45 a. m., Daily Almanac; 12:02, Organ recital, Stanley Theater; Arcadia Cafe Concert Orchestra; 2:00, Arcadia Concert Orchestra; 4:30, Edna Finestone, pianist; 7:30, Dream Daddy's bedtime stories; 8:30, WDAR Male Quartette; Playlet by WDAR Players, direction Walter Greenough; 10:10, Howard Lanin's Dance Orchestra; Special "Morning Glory Club" program; Musical comedy features from Philadelphia's leading theaters.

WEAF, New York, N. Y. (Eastern, 492), 11:00 a. m., Eugenie Farrar, pianist; 11:10, E. Ruth Anderson; 11:25, Talk hy Minnie Vining Kennedy; 12:00 noon, Lenten church services; 4:00 p. m., Hazel Ione Moses, harpist; 4:40, Wynona George Clayton, soprano; 5:00, Children's hour stories; 7:00, Gladys Gayreau and 30 violins; 7:30, Thornton Fisher; 8:00, Comtesse Morichard lo Fevre de Montagny, dramatic soprano; 8:30, Syhil Sanderson Fagen, whistler, and George Osborne, violinist, and George Ballard, tenor; 9:00, Astor Coffee Orchestra.

WEAO, Columbus, Ohio (Eastern, 360), 4:00 p. m., Agricultural lecture, Ohio State University faculty member; Musical program.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., Address, Dr. Robert Stewart Hyer; 8:30-9:30, Musical recital, Dr. Richard Mandell, Denton, Texas, and assisting musicians.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Meyer Davis Bellevue Stratford Concert Orchestra; 6:05, Sunny Jim's bedtime stories; 6:30, Meyer Davis Bellevue Stratford Concert Orchestra.

WGI, Medford Hillside, Mass. (Eastern, 360), 12:00 m., Selection on Ampico in Chickering; Chat with Ladies, Marjorie Drew; Sedections on Brunswick; 7:00 p. m., Meeting of the Amrad Big Brother Club; 7:30, Selected verses by Charles L. H. Wagner, Radin poet; Musicale; Talk, Chas. C. Farlngtou.

WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1:00 p. m., George Albert Bouchard, organist; 2:30-4:00, The Radio Dealers' Musical program; 6:30-7:30 and 11:30, Vincent Lopez Hotel Statler Orchestra; 8:50, Address, "All About Stamp Collecting," by E. B. Powers; 9:00, Concert, direction of Richmond Clothes. Buffalo atore; 11:00-11:30, Good Friday service, H. F. Wind, city superintendent, Lutheran Institutional Missions.

WGY, Schenectady, N. Y. (Eastern, 380), 12:00-3:00 p. m., Good Friday service; 6:30, Children's program; 7:35, Health talk, N. Y. State Department of Health; 7:45, "Bermuda," Dr. Sigel Roush; WGY Orchestra; Edward A. Rice, violinist; Peter Schmidt, clarinetist; 10:30, Rice String Quartet; Leah Zeh, soprano; Edward A. Rice, Tom DeStefano, violinists.

WHA, Madison, Wis. (Central, 360), 7:30 p. m., Readings from Literature, Miss M. M. McCarthy.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Walnut Theater Orchestra, Walter Davison, director; 7:30-9:00, Concert, auspices, George Piggott; Frank R. Dollens, tenor; Reading, Betty Lewis.

WHB, Kansas City, Mo., Sweeney School (Central, 411), 12:35-1:00 p. m., Popular program, Sweeney Radio Orchestra; 2:00-3:00, Ladies' hour program, Sweeney Radio Orchestra; 3:00, Weather and market information; 7:00-8:00, Special program of vocal and instrumental solos by various entertainers.

WHK, Cleveland, Ohio (Eastern, 283), 9:00 p. m., Dance program arranged by the Cleveland Radio Dealers' Association; Music by Louis Rich and his Orchestra; solo numbers, favorite entertainers.

WIP, Philadelphia, Pa. (Eastern, 509), 1:00 p. m., Gimbel Brothers' Tea Room Orchestra; Ray Steen, directors; 3:00, William H. Corrog, baritone; 6:05, Dinner music, Jordan-Lewis Dance Orchestra; 7:00, Uncle Wip's bedtime stories.

WJY, New York, N. Y. (Easterns, 405), 7:30, Rebecca Rosen, pianist; 7:50, "Income Taxes." Frank Shivit; 8:00, "Olivet to Calvary," Choir of Church of the Heavenly Rest.

WJZ, New York, N. Y. (Eastern, 455), 12:10 p. m., Friday noon hour of music, Brick Presbyterian Church; 1:00 p. m., Henry Van Der Zanden's Hotel Ambassador Trio; 2:00, Hotel Astor organ recital, Leo Riggs; 4:00, Ellnor Gunn's Fashion talk; 4:10, Amy Wegner, soprano; 4:25, "Canned Goods," R. B. Kingman; 4:40, "Concerning the Young Child," Adeline Ries; 4:50, Arts and Decorations; 5:15, "Systematic Psychology," Dean James E. Lough; 7:00, Bedtime stories, Thornton Burgess; 7:10, Aslang Lie Eide, soprano; Halfred Nelson, accompanist; 8:00, Good Friday service, West End Presbyterian Church. Dr. G. Campbell Morgan, pastor; 9:30, Robert Sanchez, tenor; Alma Milstead, soprano; 9:45, Edna MacNary, pianist; 10:15, Emma J. DuBois, trumpeter.

WLAG, Minneapolis-St. Paul, Mino. (Central, 417), 10:45-11:15 a. m., Household hints; 11:35-12:00 m., Surprise hour; 2:00-2:30 p. m., Talk for Community Fund; 2:40-4:00, Daylight concert, Dream Orchestra; 4:00-4:30, Magazine reading; 5:30-6:00, Weekly meeting, Radin Health & Toothbrush Club of America, Dr. F. W. Pepper, president; 6:00-6:30, "Choosing the Right Word," C. W. Woodward; "Radio," Ray R. Sweet; 7:30-8:15, Farm lectures, "How to Cook Fish in the Woods," Matt Saarl; 9:15, Business message; 9:30-10:45, Elks Chorus.

WLW, Cincinnati, Ohio (Central, 309), 4:00 p. m., "Journalism," T. C. O'Donnell, editor of Writers' Digest.

WMAQ, Chicago, Ill. (Central, 447.5), 2:35 p. m., Concert, Lyon & Healy recital hall; 4:20, Items of interest to women; 4:30, Pupils, Bush conservatory; 5:00, Dressmaking lessons, Mme. Elizabeth Bell; 7:00, Weekly "Wide-Awake Club," Mrs. Frances M. Ford; 7:30, Music memory contest. Mrs. Marx E. Oberndorfer; 8:00, Americanization lessons; 8:40, LaSalle Orchestra; 9:00, "The Unexplored River," John T. Zimmer; 9:15, Musical program, Bush Conservatory.

WMC, Memphis, Tenn. (Central, 500), 8:30 p. m., "Passing the Buck," Hon. Josephus Daniels; 11:00, Midnight frolic.

WOAW, Omaha, Neb. (Central, 526), 6:30 p. m., Dinner program, West Sisters' String Quartet; 9:00, "The Seven Last Words of Christ," sacred cantata, Lowe Avenue Presbyterian Church choir; Althea Stelyer, soprano; Dr. J. W. Dindinger, bass; M. V. Johnson, tenor; Johanna Anderson, director; Enid Lindberg, accompanist.

WOC, Davenport, Iowa (Central, 484), 12:00 m., Chimes concert; 3:00 p. m., "Muscles and How They Act," R. G. Maybach; 5:45, Chimes concert; 6:30, Sandman's Visit; 8:00, Musical program, Erwin Swindell, musical director, hy the Orchestra of the Reorganized Church of Jesus Christ.

WOO, Philadelphia, Pa. (Eastern, 509), 11:00 a. m., Organ recital, Mary E. Vogt; 12:03 p. m., Wanamaker Crystal Tea Room Orchestra, Robert E. Golden, director; 4:45, Organ recital, Mary E. Vogt; 7:30, Hotel Adelphia Concert Orchestra; 8:30, Special program from Fox Theater; 9:30, Organ recital, Mary E. Vogt; 10:03, Kentucky Kernels Dance Orchestra from Adelphia Hotel.

WOQ, Kansas City, Mo., Western Radio Co. (Central, 360), 7:00-7:45 p. m., Edison Recreation program, vocal solos, orchestra numbers, service reports.

WOS, Jefferson City, Mo. (Central, 440.9), 8:00 p. m., Program, Jefferson City Rotary Club Boys' Band.

WRC, Washington, D. C. (Eastern, 469), 3:00 p. m., Fashion Developments of the Moment, Women's Wear; 3:10, Song recital, Arthur McCormick, baritone; 3:30, "Beauty and Personality," Elsie Pierce; 3:35, Ethel Grant, pianist; 3:50, Magazine of Wall Street.

Where to Hear Concerts

THESE are the stations for music lovers to dial, and you can hear, providing you dial correctly and read the programs carefully, everything from jazz to opera.

Tuesday: KDKA, KFKB, KFI, KFSG, KGO, KHJ, KPO, KSD, KYW, WAAM, WAAW, WBAH, WBAP, WBZ, WCAE, WCX, WDAF, WDAP, WEAF, WFAA, WFI, WGN, WGY, WHAS, WHB, WIP, WJAX, WJY, WJZ, WLAG, WLW, WMAQ, WMC, WOAW, WOO, WOR, WSB, WWJ.

Wednesday: KDKA, KFKB, KFAE, KFI, KFNF, KFOA, KFSG, KGW, KHJ, KLX, KPO, KSD, KYW, PWX, WAAM, WAAW, WBAP, WBZ, WDAF, WDAP, WDAR, WCAE, WCX, WEAF, WEAO, WFI, WGAZ, WGI, WGN, WHAS, WHB, WHN, WIP, WJZ, WLAG, WLW, WMAQ, WOC, WOO, WOR, WOS, WSB, WTAM, WWJ.

Thursday: CKAC, KDKA, KFI, KFKB, KFSG, KGO, KGW, KHJ, KLZ, KPO, KSD, KYW, WAAM, WBAH, WBAP, WBZ, WCAE, WCAL, WCBD, WCX, WDAF, WDAP, WDAR, WEAF, WEAO, WFAA, WFI, WGI, WGN, WGY, WHAS, WHB, WHN, WIP, WJAX, WJY, WJZ, WLAG, WLW, WMAQ, WMC, WOAW, WOC, WOO, WOR, WSB, WWJ.

Friday: KDKA, KFAE, KFI, KFKB, KFOA, KFSG, KHJ, KGW, KLX, KPO, KYW, WBAH, WBAP, WBAV, WBZ, WCAE, WCAL, WCX, WDAF, WDAR, WEAF, WEAO, WFAA, WFI, WGAZ, WGI, WGN, WGY, WHAS, WHB, WHK, WHN, WIP, WJY, WJZ, WLAG, WMAQ, WMC, WOAW, WOC, WOO, WOR, WSB, WWJ.

Saturday: CKAC, KDKA, KFI, KFNF, KFSG, KGO, KHJ, KPO, KSD, KYW, PWX, WBZ, WCAE, WCAL, WDAF, WDAP, WDAR, WEAF, WFAA, WFI, WGI, WGN, WHAS, WHK, WHN, WIP, WJZ, WLAG, WMAQ, WMC, WOAW, WOC, WOO, WOR, WSB, WTAM, WWJ.

Sunday: WHK, KFI, KFNF, KFSG, KGW, KPO, KHJ, WHK, KYW, WBAP, WCAE, WCAL, WDAP, WDAR, WEAF, WFAA, WGI, WGN, WGY, WHK, WHN, WIP, WLAG, WOC, WSB.

Monday: KDKA, KFAE, KFI, KFKB, KPO, WAAM, WAAW, WBAH, WBAP, WBAV, WBZ, WCAE, WCBD, WDAF, WDAR, WEAF, WFI, WGY, WHAZ, WIP, WLAG, WLW, WMC, WOAW, WOC, WOO, WOR, WOS, WSB, WWJ.

Tuesday: KFKB, KGO, KPO, WHAS, WMAQ, WOAW, WAAW, WDAF, WEAF, WFI, WIP, WOO, WLW, WGY, WSB.

(Continued on page 18)

EARL CARROLL'S "VANITIES" ON AIR FROM KYW TUESDAY, APRIL 22

First Act of "Vanities"

MUSICAL comedy enthusiasts and the world in general will have an opportunity to hear Earl Carroll's "Vanities" next Tuesday night, April 22, at 8:15 Central time, when Station KYW, Chicago, broadcasts the entire first act direct from the Colonial theater, where the "Vanities" will have opened the night previous. KYW uses a wave length of 536 meters. The program of the first act is given so that listeners can follow the action more closely.

The program will begin at 8:15 with a short talk by Mr. Carroll, probably the only producer and manager who admits that broadcasting is a great business getter for a show. The great success of the "Vanities" over many other well-known musical comedies, should be a point in Mr. Carroll's favor. His praise of Radio and the story of the fight he has had in the support of his belief, are given elsewhere in this paper. The program should be over by 10 p. m., Central time.

Scene 1—The Birth of a New Revue

The Composer.....L. Barton Evans
The New Born.....Mlle. Renova
The Cohan Revue.....Polly Lux
The Winter Garden.....Mlle. DeLorez
White's Scandals.....Vera King
Greenwich Village Follies.....
.....Lota Cheeke
The Music Box.....Edith Parker
Ziegfeld Follies.....Betty Fitch

Scene 2

Musical Number, "Girls Were Made for Dancing," sung by Frank Blyler with Margaret Davies, assisted by Amy Frank, Lucille Moore and girls, followed by Al Thomas and Olga Borowska.

Scene 3

Baritone Solo.....J. Frank Leslie

Scene 4

A Singing Lesson.....Irene Ricardo
Harry Burns and Chas. Senna.

Scene 5—"The Soul of a Harp"

My string of pearls upon a harp belong
A golden harp of melody and song;
And as I play the string of pearls,
A vision comes of lovely girls.
I are a girl, but who knows if what I beheld
Is not the soul that dwells within my harp of gold?

The Singer.....Ruth Oswald
The Harpist.....Carlena Diamond
The Child.....Elsie Neal
The Vision.....Amy Frank
Olga Borowska, Lucille Moore,
Amy Rivere
(Staged by Senia Gluck)

Scene 6—The New Scene—Comedy Sketch

The Hero.....Don Barclay
The Heroine.....Margaret Davies
The Director.....Harry Burns
The Villain.....Charles Callahan

Scene 7—The Silver Garden

"The Band Plays Home, Sweet Home".....L. Barton Evans and Dorothy Knupp
"Pretty Peggy".....Peggy Joyce
Assisted by her Collegians

Scene 8

Travesty.....Don Barclay
Harry Burns, Charles Senna, Al Thomas, Charles Callahan, Al Clair

Scene 9

Vocal Selection.....J. Frank Lealle

Scene 10

"Crotonne Girl".....John Byam
Assisted by Margaret Davies and Cretonne Girls

Scene 11—Joe Cook, The Humorist
(Presenting a portion of his "One Man Vaudeville Show")

Scene 12—The Slave Mart
(Conceived and Arranged by Renoff)
Premiere Danseuse.....Renova
Violet Bristow, Olga Borowska, Jean Watson, Elsie Neal and Corps de Ballet
The Slave Dealer.....Renoff

Scene 13—Finale of the Furs
"When the Snowflakes Fall".....
.....John Byam
Snow Bears.....Margaret Davies and Claire Elgin
Dance of the Snowballs.....
.....Vanities Dancing Girls
Baby Lamb.....Cardinal Pearls
Baby Lambs.....(From Left to Right)
Misses O'Reilly, Cheeke, Lux, Brown
Squirrel.....Carlena Diamond
Squirrels.....(From Left to Right)
Misses Butler, Gillingham, Parker, Latham
Mole.....Dorothy Knapp
Moles.....(From Left to Right)
Misses Jackson, Patterson, Washburn, Miller
Seal.....Claire Elgin
Seals.....(From Left to Right)
Misses Borrows, Hyde, Harrisson, Palmer
Sable.....Margaret Davies
Sables.....(From Left to Right)
Misses Carr, Powell, Klug, Greenwall
Ermine.....Ruth Oswald
Ermines.....(From Left to Right)
Misses Black, DeLorez, Rich, Larson
Chinchilla, "Queen of All".....
.....Peggy Joyce

Characteristic poses of Earl Carroll (right and left), young owner and producer of "Vanities," the first act of which will be broadcast from KYW, April 22.

Claire Elgin, below, feature dancer with Earl Carroll's "Vanities," whose dancing will NOT be heard.

Pretty Peggy Joyce, below, and humorous Joe Cook, right, stars of "Vanities." Pretty Peggy is wearing her famous chinchilla robe and a MILLION dollars worth of jewels.

Ruth Oswald, below, is prima donna in Earl Carroll's "Vanities."

Wednesday, April 16

(Continued from page 15)

Hotel, Jocks DeBabary's Orchestra, Cafe Odet Orchestra, 8:30; Dudley Marquis, Morgan C. Eastman; Sammy Stewart and his Knights of Syncopation, 9:00. Program, Union Trust Co.; 9:15, Talk, singles of the Festival Health Contest; 9:30, Talk, Parent-Teacher night revue, W. Heuington Welch, organist; Herbie Mintz, pianist.

WBAH, Minneapolis, Minn. (Central, 417). 12:30-1:30 p. m., Dick Lang's Trio; Mrs. A. B. May, reader; 7:00-7:30 p. m., Lecture program, Dr. J. W. Holland.

WBAP, Fort Worth, Tex. (Central, 476). 3:30-8:30 p. m., Concert. 8:30, Dan Moody, 10:30-12:45, Concert, George Freeman's Sooner Serenaders.

WBAV, Columbus, Ohio (Eastern, 3901, 12:00 m., Piano music, Ila Leibach Orcus.

WBZ, Springfield, Mass. (Eastern, 337). 6:00 p. m., Dinner concert, WJZ String orchestra; 7:00, "Medical Section of the American Legion," Dr. Frank Crane; A. Thale; 7:30, Bedtime story for the kiddies; 7:40, Chamber music, WJZ String Orchestra; Mrs. Dorothea Wallace, soprano; 8:30, Address, National Republican Club.

WCAE, Pittsburgh, Pa. (Eastern, 462). 3:30 p. m., Piano recital, Fred Rosenfeld; 4:30, Uncle "Kayben"; 6:30, Dinner concert, William Penn Hotel; 7:30, Sunshine Girls; 7:45, Theatrical review; 8:30, Musical program.

WCK, Detroit, Mich. (Eastern, 517). 4:00 p. m., Music; 6:00, Dinner concert, Hotel Tuller; 8:30, Music, Delores Haskell.

WDAF, Kansas City, Mo., Star (Central, 411). 3:30-4:30 p. m., Musical matinee, Leo B. Dalle "Serenata"; Kansas City Club Orchestra; 9:00-7:00, School of the Air; Piano tuning in minutes, Hugo Arl; Address, speaker, Health Department; Physical Well-Being, speaker, Health Department; Talk, Frita Buhlein's Trianon Ensemble; 8:00-8:15, Bedtime by the Minister of the Sunshine Circle (Kansas University Fine Arts Department; 11:15 p. m., 1:00 a. m., Nighthawk frolic, "Merry Old Chief" and Coon-Sanders Orchestra.

WDAP, Chicago, Ill. (Central, 380). 7:00-8:30 p. m., Drake Ensemble and Blackstone Quintet; 10:00, John Richard, Ralph Emerson, organist; Jack Chapman Orchestra.

WDAR, Philadelphia, Pa. (Eastern, 393). 11:15 a. m., Daily Almanac; 12:02, Organ recital, Stanley Theater; Dinner music, Arcadia Cafe Concert Orchestra; 2:00, Arcadia Cafe Concert Orchestra; 3:30, Math Song Lessons, Evelyn Merrihew, 7:30, Bryant Dadd's book time stories; 8:00, Arcadia Cafe Concert Orchestra; 8:30, "Cave Children," Louis Gaston Dance program, Emil Coleman's Orchestra; 10:10, Howard Lanin's Arcadia Cafe Dance Orchestra.

WEAF, New York, N. Y. (Eastern, 492). 11:00 a. m., Mabel Emplo, soprano; 11:15, John Merrill; 11:30, New York Tuberculosis Society; 12:00 m., Interdenominational church services; 4:00 p. m., Montmartre Orchestra; 5:00, Talk by Mary Paddon; 5:15, John B. Kelley, tenor, and Blanche Kelley, soprano; 7:00, Synagogue services; 7:30, Thornton Fisher; 7:50, American Association of Dentists; 8:00, Columbia University; 8:20, Marjorie Horton Haskell, soprano, and Paul Haskell, tenor; 8:50, Program by Sterling Coal Association; 9:00, Chicle program; 10:00, Salvation Army Band.

WEAO, Columbus, Ohio (Eastern, 360). 4:00 p. m., Agricultural lecture, Ohio State University faculty member; Concert, Hotel Deshler.

WFAA, Dallas, Texas (Central 476). 12:30-1:00 p. m., Musical recital, the Red-Headed Girl of the Journal, Mrs. A. B. Pegan, director; 6:00, 7:00 p. m., Meyer Davis Bellevue Stratford Concert Orchestra; 8:00, Merch, Junior High School Orchestra of Easton, Pa., A. B. Pegan, director; 8:00, Bedtime stories; 8:30, Meyer Davis Bellevue Stratford Concert Orchestra.

WGI, Medford Hillside, Mass. (Eastern, 360). 12:00 m., Selection on the Amplco in Chickering; Chat with Radio, Marjorie Advena Sedan; Musical Numbers; 1:00 p. m., Meeting of the Amrad Hig Brother Club; Lesson, "How to Tune Your Sets, Chas. W. Cassino, "Hig Smoke"; 3:30, Concert, Hill Section Orchestra.

WGS, Buffalo, N. Y. (Eastern, 319). 12:30-1:00 p. m., Organ recital, Alberto Hourglass organist; 5:30-6:00, The Radio Dealers musical program; 6:30-7:30, 11:30, Vincent Lopez Hotel Statler Orchestra; 8:50, Address, Hotel Statler Secretary, Buffalo Chamber of Commerce; Business Commission; 9:00, Concert, Direction Ernest Messerschmitt.

WGY, Schenectady, N. Y. (Eastern, 380). 6:30 p. m., "Adrenaline Story," Youth's Companion.

WHA, Madison, Wis. (Central, 940). 1:30 p. m., "Better Times with More Alfalfa," Prof. R. H. Crabee.

WHAS, Louisville, Ky. (Central, 400). 4:00-5:00 p. m., Talent, Theater Orchestra; 7:30-9:00, Mrs. Emory Sold, soprano; Reading, Loredon A. Sergeshill; Martin H. Berger, tenor; Mrs. Thomas D. Herrick, accompanist; Educational talk, Frank Bolland, faculty State Agricultural College; Frank Bolland, tenor.

WHB, Kansas City, Mo., Sweeney School (Central, 411). 12:30-1:00 p. m., Organ recital by Sweeney Radio Orchestra; 2:00-3:00, Ladies' hour program, Sweeney Radio Orchestra; 7:00 p. m., Weather and market information; 7:05-8:00, Sweeney Radio Orchestra.

WIP, Philadelphia, Pa. (Eastern, 509). 1:00 p. m., Olmsel Brothers Tea Room orchestra, Ray Steed, director; 6:00, Aunt Jane's Nursery; Dinner Dance Orchestra; 7:00, Uncle Wip's bedtime stories.

WJZ, New York, N. Y. (Eastern, 455). 12:00 m., Lenten services, Trinity Church; Rev. Charles Fiske Fiske, pastor; 4:00 p. m., Nanette's Schraft's Tea Room Orchestra; 5:00, New York Board of Education; 5:30, Landau and His Harbor Inn Novelers; 6:00, Big Brother Elmer Talk; 6:10, "Peeps at People," Edythe H. Browne; 6:20, "Interior Decorating"; Good Housekeeping; 4:36, Tea concert, Hotel Commodore; Story Book Lady; 5:30, Herman H. Horne; 7:00, Story Book Lady; 7:30, Dance program, Irving Aaronson and His Commanders Orchestra; 7:45, The Progress of the World—a Review of Reviews talk; 8:00, Dance program Irving Aaronson and His Cafe Boulevard Orchestra; 9:30, "The City Record," Hon. Peter J. Brady; 8:45, Martian Christian, organist; Hinton Sononey, pianist; 9:00, "Romantic Castles of Italy," Mrs. Wm. Wood Prince; Wallace J. Proctor, pianist; 9:30, New York University Glee Club; 10:00, Dance program, Emil Coleman's Treasure Orchestra.

WLAG, Minneapolis-St. Paul, Minn. (Central 417). 10:15 a. m., Morning Melodies; 11:30, Noon-day Musicale; 12:00 p. m., Noonday Concert; 1:00, Matinee; 2:00, Surprise hour; 2:00-2:30 p. m., "Dressmaking"; Mrs. Myrtle Sapersteen; "Hairdressing" Maude Hare; 2:40-4:00 p. m., Daylight concert, 4:00-4:30, Magazine reading; 5:30-8:00, Children's stories, Mrs. Robert Carroll; 6:00-6:30, Concert Instructions and Purpose of Signs," E. R. Kelley; "Cleaning Week Talk"; 7:30-8:15, Farm lectures, "Came to Seed" but Remained to Spray," A. H. Rugger; "Making Minnesota Blossom," Mrs. John Howard Todd; "Feeding Baby Chicks," E. H. Smith; 9:15, Business message; 9:30, Musical program, Exchange Club of St. Paul; 10:45, Casino Orchestra from St. Paul Hotel, Sam Friman, director.

WLW, Cincinnati, Ohio (Central, 309). 4:00 p. m., Program for the Shut-Ins," Warlitzer Concert Company; 7:15, Selections from "If Wishes Were Horses," musical play, Junior Show Shop Players; 8:00, "All About Stamp Collecting," E. B. Power; 8:15, Choir concert, "The Crucifixion," Choirs of St. Mark's Evangelical Church and Plymouth Congregational Church; 8:45, "Medicine in the Days of Art and Swope Coon Dog Orchestra.

WMAQ, Chicago, Ill. (Central, 447.5). 1:00 p. m., Speeches, Chicago Association of Commerce; 2:35, Lyon & Healy program; 4:20, Items of Interest to women; 4:30, Pupils Cosmopolitan School of Music; 7:00, Stories for the children, Georgene Faulkner, story lady; 7:30, Weekly lecture from Northwestern University; 8:10, La Salle Hotel Orchestra; 9:00, Talks, various Chicago charities; 9:15, Program, Florence Nelson, soprano.

WOC, Davenport, Iowa (Central, 484). 12:00 m., Chimes concert; 3:30 p. m., Lecture, C. A. Russell; 6:30, Sandman's visit; 6:35, Musicale, Erwin Swindell, musical director; Fern Dameron, soprano; Paul Ochefive, tenor; Margaret O'Donnell, soprano; Haut Deshlofs violin-concerting.

WOO, Philadelphia, Pa. (Eastern, 509). 11:00 a. m., Organ recital, Mary T. Quigley, organist; 12:02 p. m., Skeeker Crystal Tea Room Orchestra, Robert E. Golden, director; 2:45, Organ recital, Mary E. Vogt; 7:30, Havana Casino Orchestra from New York; 8:00, Current Topics, director; 8:15, Organ recital, Mary E. Vogt; 9:00, WOO Orchestra, Robert E. Golden, director; 10:02, Kentucky Kernals Dance Orchestra from Philadelphia Hotel.

WOQ, Kansas City, Mo. (Central, 360). 7:00-8:00 p. m., Edison Recreation program.

WOS, Jefferson City, Mo. (Central, 440.9). 8:00 p. m., "Should Missouri Reform Criminal Procedure?" Judge M. F. Miller; 8:20, Barn dance program, Bill Cason, old-time colored fiddler; his partner, Ola Oatbright, guitarist.

WTAM, Cleveland, Ohio (Eastern, 390). 8:00 p. m., Musical program, Cleveland Automobile Club; Philharmonic Orchestra; Easter story reading, Alleth Willard; Solo, Dick Finnegan, boy soprano; Trio, Neil Steck, harpist, Ben Silberfarb, violinist, Mrs. Chilson Leonard, pianist; Mezzo Soprano, Mrs. Chilson Leonard; Solo, Edna Dunham Willard, soprano; Reading, "The Story of the Cross," W. Wymberman; solo, Edna Dunham Willard, soprano; Address, Right Rev. Bishop DuMoulin, Bishop Coadjutor of Ohio; Harp solo, Neil Steck; Solo, Arthur M. Parry, baritone; Solo, Florence Wasson; Trio, Neil Steck, harpist, Ben Silberfarb, violin, Max Schmitt, cello; Solos, Florence Wasson and Arthur Parry.

WWJ, Detroit, Mich. (Eastern, 517). 8:00 a. m., Studio concert, Hotel Tuller Orchestra; 12:00 m., Goldkette's Orchestra; 2:00 p. m., News Items; 4:00, Seven boys' Band, Jackson, Mich.; Vocal selections, pupils of Blanch Bliss Lyons.

Thursday, April 17

CKAC, Montreal, Canada (Eastern, 425). 4:00 p. m., Weather, stock, news, music; 8:30, Canadian National Railway Artists' Talk, official.

KDKA, E. Pittsburgh, Pa. (Eastern, 326). 12:20 p. m., Lenten services, Trinity church; 5:30, "The Forgiveness of Sins," Rev. Hugh F. Kerr; 6:15, Dinner concert, KDKA Little Symphony Orchestra; 7:30, Wendell Hall, the Red-Headed Musical Fool; 8:00, "Last Words," Choir Ensemble Society; 11:30, Concert.

KFI, Los Angeles, Calif. (Pacific, 469). 6:45-7:30 p. m., Y. M. C. A. concert; Biltmore Hotel Orchestra; Ambassador Hotel concert; 9:00-10:00, Examiner concert; 10:00-11:00, Concert presented by Celeste Rhagan, pianist.

KFKB, Millard, Kansas (Central, 286). 8:05 p. m., "What Should Every Veteran Have," Mary Worcester; 8:30, "Line and Form," Prof. Stanislaw Hinderlong Gallo, pianist; Vocal solos, Sheldon Storer; Dorothy Hall, violinist.

KFSG, Los Angeles, Calif. (Pacific, 278). 3:30-4:30 p. m., Organ recital through courtesy of Prof. Wm. J. Kraft; 6:30, Bedtime stories by Uncle Ballads and others; 6:30-8:00, Children's hour, Bible stories, 8:00-8:25, Boy talks, by Thos. H. Brown, Boy Scout commissioner; 9:15, Talks by Dr. Charles Gilbert Ames, Semple McPherson; 9:15-10:00, Special program presented by students of the Echo Park Evangelistic and Missionary Training Institute and the Angelus Temple choir of girls' voices; 10:02-10:10, The family altar and prayer, The Glen Rondo chimes.

KGO, Oakland, Calif. (Pacific, 312). 5:00 p. m., Breakfast Talk, Earl Hay Serenaders, Walter H. Huntly, director; Mrs. A. Wallace J. Proctor, soprano; Euphonium solo, George M. Flint; Joseph Sharp, bass; Miss Alice Ball soprano; Carlton Hollenbeck, pianist; Irwin Johnson, baritone; Readings, Dorothy Hoardman.

KGW, Portland, Ore. (Pacific, 492). 12:30 p. m., Concert; 3:30, Woman's store program; 4:00, Accordion solos, Johnny Schuster; 8:15, Studio program of classic music, George Olsen's Metropolitan Orchestra; 10:00, Dance music George Olsen's Orchestra.

KHJ, Los Angeles, Calif. (Pacific, 395). 12:30-1:15 p. m., Program presented by Sorority Bell Robinson, Hawaiian guitar; Edward Murphey, bass baritone; 2:30-3:30, Program through courtesy of Barker Brothers; 6:45-7:30, Children's program, presenting Jane Adele Riley, reader, age 5 years; Virginia Eberle, pianist, age 10 years; Nancy Parent, pianist, 13 years; Katherine Girard, soprano, age 11 years; Rita Cummings, soprano, age 12 years.

KPO, San Francisco, Calif. (Pacific, 423). 1:00-2:00 p. m., Rudy Seiger's Fairmont Hotel Orchestra; 2:30-3:30, Matinee Program, Alma Martha Fawikes-Haun, reader; Rudolph Gilbert Meyle, pianist; 6:00-6:30, Rudy Seiger's Fairmont Hotel Orchestra; 6:30-6:45, Big Brother's hour stories, "Big Brother" of KPO, Book of Knowledge; 6:45-7:30, Rudy Seiger's Fairmont Hotel Orchestra; 8:00-9:00, Organ recital, Theodore J. Irwin; 9:00-10:00, Program by the Cap and Bells, Mabel Rudolph, contralto; Mrs. Corie Cogill Miller, accompanist; John Afendras, violinist; Helen O'Neal, accompanist; 10:00-11:00, E. Max Bradfield's Versaille Band.

KYW, Chicago, Ill. (Central, 536). 11:35 a. m., Table talk, Mrs. Anna J. Peterson; 6:00 p. m., Dinner concert, bedtime story, "Uncle Bob;" 7:00, Dinner concert, Joska DeBabary's Orchestra; Clyde Doerr's Orchestra; 7:25, Sports talk, Hugh S. Fullerton; 7:40, Twenty minutes of good reading, Rev. C. J. Pernin; 8:20, Whiting Community Choral, Morgan L. Eastmen, conductor; Mrs. Stanford Conover, soprano; Address, Right Rev. Bishop Muldoon, Bishop Coadjutor of Ohio; Harp solo, Neil Steck; Solo, Arthur M. Parry, baritone; Solo, Florence Wasson; Trio, Neil Steck, harpist, Ben Silverberg, violin, Max Schmitt, cello; Solos, Florence Wasson and Arthur Parry.

WWJ, Detroit, Mich. (Eastern, 517). 8:00 a. m., Studio concert, Hotel Tuller Orchestra; 12:00 m., Goldkette's Orchestra; 2:00 p. m., News Items; 4:00, Seven boys' Band, Jackson, Mich.; Vocal selections, pupils of Blanch Bliss Lyons.

Tuesday: CKAC, KFI, KPO, KYW, WDAP, WFI, WIP, WJZ, WLW, WMAQ, WOR, WWJ.

Wednesday: CKAC, KGW, KHJ, KSD, KYW, WEAF, WDAP, WFI, WJZ, WLW, WOR, WOS, WWJ.

Thursday: CKAC, KFI, KGW, KPO, KYW, WDAP, WEAF, WFI, WIP, WJZ, WLW, WMAQ, WOR, WWJ.

Friday: CKAC, KPO, KYW, WEAF, WFI, WIP, WJZ, WLW, WMAQ.

Saturday: KFI, KHJ, KGW, KPO, KYW, WDAP, WEAF, WFI, WIP, WJZ, WLW, WMAQ, WOR, WTAM, WWJ.

Monday: CKAC, KPO, KYW, WHAZ, WIZ, WCAE, WCAL, WCK, WDAP, WEAF, WEAO, WFAA, WFI, WGR, WGY, WHAS, WHB, WHN, WIP, WJZ, WJR, WJY, WLW, WMAQ, WMC, WOAW, WOC, WOO, WOR, WSB, WWJ.

Where to Hear Concerts

THESE are the stations for music lovers to dial, and you can hear, providing you dial correctly and read the programs carefully, everything from jazz to opera.

Tuesday: KDKA, KFKB, KFI, KFSG, KHJ, KPO, KSD, KYW, WAAM, WAAW, WFAB, WHAP, WIZ, WCAE, WCK, WDAF, WDAP, WEAF, WFAA, WFI, WGN, WHY, WHAS, WHB, WFI, WJAN, WJY, WJZ, WLAG, WLW, WMAQ, WMC, WDAW, WOO, WOR, WSB, WWJ.

Wednesday: KDKA, KFKB, KFAE, KFI, KFNF, KFOA, KFSG, KGW, KHJ, KLN, KPO, KSD, KYW, PWX, WAAM, WAAW, WFAB, WHAP, WDAF, WDAP, WDAH, WCSH, WCN, WEAF, WEAO, WFI, WGR, WGY, WHAS, WHB, WHN, WIP, WJZ, WLAG, WLW, WMAQ, WMC, WOAW, WOC, WOO, WOR, WSB, WTAM, WWJ.

Thursday: CKAC, KDKA, KFI, KFKB, KFSG, KGO, KGW, KHJ, KLZ, KPO, KSD, KYW, WAAM, WBAH, WHAP, WBZ, WCAE, WCAL, WCHD, WCN, WDAF, WDAP, WDAH, WEAF, WEAO, WFAA, WFI, WGR, WGN, WGY, WHAS, WHB, WHN, WIP, WJAN, WJY, WJZ, WLAG, WLW, WMAQ, WMC, WOAW, WOC, WOO, WOR, WSB, WWJ.

Friday: KDKA, KFAE, KFI, KFKB, KFOA, KFSG, KHJ, KGW, KLN, KPO, KYW, WBAH, WHAP, WBAV, WHZ, WCAE, WCAL, WCK, WDAF, WEAF, WFI, WIP, WOO, WLW, WGY, WBR.

Saturday: CKAC, KDKA, KFI, KFNF, KFSG, KGO, KHJ, KPO, KSD, KYW, PWX, WBZ, WCAE, WCAL, WDAP, WDAF, WDAH, WEAF, WFI, WHJ, WHN, WHAS, WHK, WHN, WIP, WJZ, WLAG, WJAQ, WMC, WOAW, WOC, WOO, WOR, WSB, WWJ.

Sunday: CKAC, KDKA, KFI, KFNF, KFSG, KGW, KPO, KHJ, WHK, KYW, WHAP, WCAE, WCAL, WDAP, WDAH, WEAF, WFI, WHJ, WHN, WIP, WJZ, WLAG, WJAQ, WMC, WOAW, WOC, WOO, WOR, WSB, WWJ.

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Tuesday: KFKB, KGO, KPO, WHAS, WMAQ, WOAW, WBAW, WDAF, WEAF, WFI, WIP, WOO, WLW, WGY, WBR.

Friday, April 18

KOKA, F. Pittsburgh, Pa. (Eastern, 3261). 12:20 p. m., Lenten services, First Presbyterian church; 5:30, "The Key," 6:15, Organ recital, Carmeo Moore; Dinner concert, Stanley Theater Orchestra; 7:30, Weekly Health Talk; 7:35, Hermosita Trio; Bigel Rosch, violinist; Sonora, violinist; Vocalist, Mrs. Helen Crane; Vocalist, Jim Ahlgren; W. W. Benedict, pianist; "The Sunny Side of Life," Rev. H. H. Hitchman; Quartet; Vocalist, Mrs. E. E. Mey; "Our National Anthem," R. H. Ferguson.

WGC, Davenport, Iowa (Central, 484). 12:00 m., Chimes concert; 3:00 p. m., "Mother Goose Land," Mrs. Ruth Gaylord; 6:30, Bedtime stories; 6:35, Musicale, Erwin Swindell, musical director; Fern Dameron, soprano; Paul Ochefive, tenor; Margaret O'Donnell, soprano; Haut Deshlofs violin-concerting.

WGO, Philadelphia, Pa. (Eastern, 509). 11:00 a. m., Organ recital, Mary T. Quigley, organist; 12:02 p. m., Skeeker Crystal Tea Room Orchestra, Robert E. Golden, director; 2:45, Organ recital, Mary E. Vogt; 7:30, Havana Casino Orchestra from New York; 8:00, Current Topics, director; 8:15, Organ recital, Mary E. Vogt; 9:00, WOO Orchestra, Robert E. Golden, director; 10:02, Kentucky Kernals Dance Orchestra from Philadelphia Hotel.

WGR, Buffalo, N. Y. (Eastern, 319). 12:30-1:00 p. m., Organ recital, Alberto Hourglass organist; 5:30-6:00, The Radio Dealers musical program; 6:30-7:30, 11:30, Vincent Lopez Hotel Statler Orchestra; 8:50, Address, Hotel Statler Secretary, Buffalo Chamber of Commerce; Business Commission; 9:00, Concert, Direction Ernest Messerschmitt.

WGY, Schenectady, N. Y. (Eastern, 380). 6:30 p. m., "Adrenaline Story," Youth's Companion.

WHA, Madison, Wis. (Central, 940). 1:30 p. m., "Better Times with More Alfalfa," Prof. R. H. Crabee.

WHAS, Louisville, Ky. (Central, 400). 4:00-5:00 p. m., Talent, Theater Orchestra; 7:30-9:00, Mrs. Emory Sold, soprano; Reading, Loredon A. Sergeshill; Martin H. Berger, tenor; Mrs. Thomas D. Herrick, accompanist; Educational talk, Frank Bolland, faculty State Agricultural College; Frank Bolland, tenor.

WHB, Kansas City, Mo., Sweeney School (Central, 411). 12:30-1:00 p. m., Organ recital by Sweeney Radio Orchestra; 2:00-3:00, Ladies' hour program, Sweeney Radio Orchestra; 7:00 p. m., Weather and market information; 7:05-8:00, Sweeney Radio Orchestra.

WIP, Philadelphia, Pa. (Eastern, 509). 1:00 p. m., Olmsel Brothers Tea Room orchestra, Ray Steed, director; 6:00, Aunt Jane's Nursery; Dinner Dance Orchestra; 7:00, Uncle Wip's bedtime stories.

WJZ, New York, N. Y. (Eastern, 455). 12:00 m., Lenten services, Trinity church; Rev. Charles Fiske Fiske, pastor; 4:00 p. m., Nanette's Schraft's Tea Room Orchestra; 5:00, New York Board of Education; 5:30, Landau and His Harbor Inn Novelers; 6:00, Big Brother Elmer Talk; 6:10, "Peeps at People," Edythe H. Browne; 6:20, "Interior Decorating"; Good Housekeeping; 4:36, Tea concert, Hotel Commodore; Story Book Lady; 5:30, Herman H. Horne; 7:00, Story Book Lady; 7:30, Dance program, Irving Aaronson and His Commanders Orchestra; 7:45, The Progress of the World—a Review of Reviews talk; 8:00, Dance program Irving Aaronson and His Cafe Boulevard Orchestra; 9:30, "The City Record," Hon. Peter J. Brady; 8:45, Martian Christian, organist; Hinton Sononey, pianist; 9:00, "Romantic Castles of Italy," Mrs. Wm. Wood Prince; Wallace J. Proctor, pianist; 9:30, New York University Glee Club; 10:00, Dance program, Emil Coleman's Treasure Orchestra.

WLAG, Minneapolis-St. Paul, Minn. (Central 417). 10:15 a. m., Morning Melodies; 11:30, Noon-day Musicale; 12:00 p. m., Noonday Concert; 1:00, Matinee; 2:00, Surprise hour; 2:00-2:30 p. m., "Dressmaking"; Mrs. Myrtle Sapersteen; "Hairdressing" Maude Hare; 2:40-4:00 p. m., Daylight concert, 4:00-4:30, Magazine reading; 5:30-8:00, Children's stories, Mrs. Robert Carroll; 6:00-6:30, Concert Instructions and Purpose of Signs," E. R. Kelley; "Cleaning Week Talk"; 7:30-8:15, Farm lectures, "Came to Seed" but Remained to Spray," A. H. Rugger; "Making Minnesota Blossom," Mrs. John Howard Todd; "Feeding Baby Chicks," E. H. Smith; 9:15, Business message; 9:30, Musical program, Exchange Club of St. Paul; 10:45, Casino Orchestra from St. Paul Hotel, Sam Friman, director.

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WOQ, Kansas City, Mo. (Central, 360). 7:00-8:00 p. m., Edison Recreation program.

WOS, Jefferson City, Mo. (Central, 440.9). 8:00 p. m., "Should Missouri Reform Criminal Procedure?" Judge M. F. Miller; 8:20, Barn dance program, Bill Cason, old-time colored fiddler; his partner, Ola Oatbright, guitarist.

WTAM, Cleveland, Ohio (Eastern, 390). 8:00 p. m., Musical program, Cleveland Automobile Club; Philharmonic Orchestra; Easter story reading, Alleth Willard; Solo, Dick Finnegan, boy soprano; Trio, Neil Steck, harpist, Ben Silberfarb, violin, Mrs. Chilson Leonard, pianist; Mezzo Soprano, Mrs. Chilson Leonard; Solo, Edna Dunham Willard, soprano; Reading, "The Story of the Cross," W. Wymberman; solo, Edna Dunham Willard, soprano; Address, Right Rev. Bishop DuMoulin, Bishop Coadjutor of Ohio; Harp solo, Neil Steck; Solo, Arthur M. Parry, baritone; Solo, Florence Wasson; Trio, Neil Steck, harpist, Ben Silberfarb, violin, Max Schmitt, cello; Solos, Florence Wasson and Arthur Parry.

WWJ, Detroit, Mich. (Eastern, 517). 8:00 a. m., Studio concert, Hotel Tuller Orchestra; 12:00 m., Goldkette's Orchestra; 2:00 p. m., News Items; 4:00, Seven boys' Band, Jackson, Mich.; Vocal selections, pupils of Blanch Bliss Lyons.

(Continued on page 18)

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Words of Christ," sacred cantata, Lowe Avenue Presbyterian Church choir; Althea Stelyer, soprano; Dr. J. W. Dindinger, bass; M. V. Johnson, tenor; Johanna Anderson, director; Enid Lindberg, accompanist.

WOC, Davenport, Iowa (Central, 484), 12:00 m., Chimes concert; 3:00 p. m., "Muscles and How They Act," R. G. Maybach; 5:45, Chimes concert; 6:30, Sandman's Visit; 8:00, Musical program, Erwin Swindell, musical director, by the Orchestra of the Reorganized Church of Jesus Christ.

WOO, Philadelphia, Pa. (Eastern, 509), 11:00 a. m., Organ recital, Mary E. Vogt; 12:03 p. m., Wanamaker Crystal Tea Room Orchestra, Robert E. Golden, director; 4:45, Organ recital, Mary E. Vogt; 7:30, Hotel Adelphia Concert Orchestra; 8:30, Special program from Fox Theater; 9:30, Organ recital, Mary E. Vogt; 10:03, Kentucky Kernels Dance Orchestra from Adelphia Hotel.

WOQ, Kansas City, Mo., Western Radio Co. (Central, 360), 7:00-7:45 p. m., Edison Recreation program, vocal solos, orchestra numbers, service reports.

WOS, Jefferson City, Mo. (Central, 440.9), 8:00 p. m., Program, Jefferson City Rotary Club Boys' Band.

WRC, Washington, D. C. (Eastern, 469), 3:00 p. m., Fashion Developments of the Moment, Women's Wear; 3:10, Song recital, Arthur McCormick, baritone; 8:..0, "Beauty and Personality," Elsie Pierce; 3:35, [illegible] Grant, pianist; 3:50, Magazine of Wall Street.

(Continued on page 18)

Director; Radio solo, Mrs. R. A. Carle; Violin solo, Mrs. Frederic M. Nicolaus; Songs and ballads, Viola Miller, soloist; Monologs, Messers. W. N. Rossington, A. E. Pill and Jimmy Hindson; Solos, Jimmy Hindson; A. E. Pill, baritone; W. N. Rossington; Scraps, Messers. Rossington, Pill and Hindson.

WJY, New York, N. Y. (Eastern, 405), 7:30 p. m., "Food Supply and Distribution to Greater New York," William T. Donnelly; 7:45, Josephine Evans, soprano; 8:05, "Golf," Innis Brown; 8:20, Sterling Male Quartet; 8:45, "South American Jungles at Night," Harold E. Anthony; 9:00, The White Way Trio; 9:30, Ralph L. Grosvenor, baritone; 10:00, Montague Newman, violinist; Mrs. J. W. Anderson, soprano; 10:40, J. Vincent Moore Entertainers.

WJZ, New York, N. Y. (Eastern, 455), 12:00 m., Lenten service, Trinity Church, Rev. Charles Fiske, minister; 1:00 p. m., Pennsylvania Concert Orchestra; 2:00, New York Board of Education; 3:00, Afternoon Auditorium concert, Wanamaker Auditorium; 4:00, Elinor Gunn's Fashion talk; 4:10, "Joys of Collaboration," Harriet Ford; 4:20, "Food for the Middle Years," Winifred S. Gibbs; 4:30, "Fashions," Harper's Bazaar; 4:45, Ella Schreiber, soprano; 5:00, Regalbuto Sisters, pianists; 5:15, Ella Schreiber, soprano; 7:00, Uncle Dave Cory's "Jack Rabbit Stories"; 7:30, Time's "Pop Question Game"; 7:45, Emily V. Ebert, soprano; 8:00, "Socialism," Dr. Henry P. Fairchild; 8:30, Wanamaker organ recital, Wanamaker Concert, Mrs. James H. Green, director; Christine Adams, cellist.

KFAE, Pullman, Wash. (Pacific, 330), 7:30 p. m., "The Growth of International Interdependence," Prof. F. R. Yoder; "Alfalfa in Rotation with Wheat Benefited by Gypsum," Prof. R. P. Cope; "Value of a Milk Campaign," Mary Sutherland; Varsity Quartet; Song hits, Fred Marshall; Book chat, Alice L. Webb.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., Vocal and Instrumental concert; 8:00-9:00, Evening Herald concert; 9:00-10:00, Examiner concert; 10:00-11:00, Concert of vocal and instrumental numbers arranged by Harry Porter; 11:00-12:00, Concert by the Ambassador-Max Fischer Cocoanut Grove Orchestra.

KFKB, Milford, Kansas (Central, 286), 8:05 p. m., "Kansas Roads," Prof. C. H. Scholer; 8:30, "Problems In Rural Electrification," Prof. J. L. Brenneman; Elsie H. Smith, pianist; Vocallst, Prof. Ira Pratt; Robert Gordon, cellist.

KFOA, Seattle, Wash. (Pacific, 455), 8:30 p. m., Leo Feist night, a program of late song hits of the Leo Feist Publishing Company, arranged by Lew Mahan.

KFSG, Los Angeles, Calif. (Pacific, 278), 3:30-4:30 p. m., Special musical program under direction of Gladwyn N. Nichols; 6:30-7:00, Children's hour; International Sunday School lesson for April 20th, reviewed by Mrs. M. Kennedy; 8:00-9:15, Revival services by Aimee Semple McPherson; 9:15-10:00, Dream Daddy's bedtime stories; 8:30, WDAR Male Quartette; Playlet by WDAR Players, direction Walter Greenough; 10:10, Howard Lanin's Dance Orchestra; Special "Morning Glory Club" program; Musical comedy features from Philadelphia's leading theaters.

WEAF, New York, N. Y. (Eastern, 492), 11:00 a. m., Eugenie Farrar, pianist; 11:10, E. Ruth Anderson; 11:25, Talk by Minnie Vining Kennedy; 12:00 noon, Lenten church services; 4:00 p. m., Hazel Ione Moses, harpist; 4:40, Wynona George Clayton, soprano; 5:00, Children's hour stories; 7:00, Gladys Gayreau and 30 violins; 7:30, Thornton Fisher; 8:00, Comtesse Morichard le Fevre de Montagny, dramatic soprano; 8:30, Sybil Sanderson Fagen, whistler, and George Osborne, violinist, and George Ballard, tenor; 9:00, Astor Coffee Orchestra.

WEAO, Columbus, Ohio (Eastern, 360), 4:00 p. m., Agricultural lecture, Ohio State University faculty member; Musical program.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., Address, Dr. Robert Stewart Hyer; 8:30-9:30, Musical recital, Dr. Richard Mandell, Denton, Texas, and assisting musicians.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Meyer Davis Bellevue Stratford Concert Orchestra; 6:05, Sunny Jim's bedtime stories; 6:30, Meyer Davis Bellevue Stratford Concert Orchestra.

WGI, Medford Hillside, Mass. (Eastern, 360), 12:00 m., Selection on Ampico in Chickering; Chat with Ladies, Marjorie Drew; Sedections on Brunswick;

Saturday, April 19

(Continued from page 17)

CKAC, Montreal, Canada (Eastern, 425), 7:00 p. m., Kiddies' stories in French and English; 7:30, Rex Battle and his Mt. Royal Hotel Concert Orchestra; Nap. Dansereau, cellist, Rex Battle, pianist; 8:30, Frontenac Breweries' Band and Artists direct from Frontenac Breweries; 10:30, Joseph C. Smith and his Mt. Royal Hotel Dance Orchestra; George Fisburg, pianist.

CKCH, Ottawa, Canada (Eastern, 435), 8:00 p. m., Chateau Laurior Orchestra; Miss G. Stringer, soprano; Mrs. H. J. Cloran, harpist; H. H. Clarke, bass; Pianoforte solo, Mrs. W. J. Atkinson; Chateau Laurier Orchestra.

KDKA, E. Pittsburgh, Pa. (Eastern, 326), 12:20 p. m., Lenten services, Trinity Church, Rev. F. C. Lauderburn; 1:30, Concert, Daugherty's Orchestra; 6:15, Westinghouse Band, T. J. Vastine, conductor; 7:30, Story, Dr. David Land; 7:45, "Last Minute Helps to Teachers of Adult and Secondary Classes," Carmen Carver Johnson; 8:00, "Mary's Lamb," Dramatic League of Pittsburgh; 8:30, Westinghouse Band; Mrs. Frank M. Myler, contralto; George L. Arms, baritone.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., Popular concert; 8:00-9:00, Vocal and instrumental concert; 9:00-10:00, Examiner concert; 10:00-11:00, Concert presented by Ann Risher.

KGD, Oakland, Calif. (Pacific, 312), 8:00 p. m., "The Piper." KGO Players; Arion Trio.

KGW, Portland, Ore. (Pacific, 492), 3:30 p. m., Children's program; Story, Aunt Nell; 10:00, Dance Music, George Olsen's Metropolitan Orchestra.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Program presenting Floryane Thompson, soprano; 1:45, Special program presenting Dr. Mayer Winkler, Rabbi of Sinai congregation; 2:30-3:30, Program through courtesy of Barker Brothers; 6:45-7:30, Children's program, presenting Billy Anderson, 4 years, Jack Cullen, 13 years, and Richard Cullen, 11 years, violinists; Mary Katherine Link, pianist, age 8 years, pupil of Marguerite Hauber; 8:00-10:00, Program presented through courtesy of the Glendale Realty Board, E. Morgan Isaac, speaker; Pizzicato Quartet.

KPO, San Francisco, Calif. (Pacific, 423), 1:00-2:00 p. m., Rudy Seiger's Fairmont Hotel Orchestra; 2:30-3:30, Junior Musical of San Francisco, Mrs. Bermingham, pres.; 3:30-5:30, E. Max Bradfield's Versatile Band; 8:00-12:00, Art Weidner's Fairmont Hotel Orchestra; KPO Trio.

KSD, St. Louis, Mo. (Central, 546), 8:00 p. m., Missouri Theater Orchestra concert and specialties.

KYW, Chicago, Ill. (Central, 536), 11:35 a. m., Table talk, Mrs. Anna J. Peterson; 6:45 p. m., Children's bedtime story, "Uncle Bob;" 7:00; Dinner concert, Congress Hotel, Joska DeBabary's Orchestra; Clyde Doerr's Orchestra; 8:00, Hulda Hartz, soprano; Bruce Wainman, baritone; Rose Chricus, pianist; Sophie Miller, soprano; Sallie Menkes, accompanist; Prof. John Wheeler, astrologer; 9:05, "Under the Evening Lamp," Youth's Companion; 10:00-12:00, Late show.

WBAH, Minneapolis, Minn. (Central, 417), 12:30-1:30 p. m., Children's vaudeville; 7:00-7:30, Council of Churches.

WBAP, Fort Worth, Texas (Central, 476), 7:00-7:30 p. m., Review, Interdenominational Sunday School Lesson and Radio Bible Class, Mrs. W. F. Barnum.

WBAV, Columbus, Ohio (Eastern, 390), 12:00 m., Piano music, Ila Lorbach Owens; News.

WBZ, Springfield, Mass. (Eastern, 337), 7:00 p. m., Dinner concert, Hotel Kimbal Trio; 7:30, Bedtime story for the kiddies; 7:40, Concert, Smith College Trio; 8:30, Tschaikowsky Quartet.

WCAE, Pittsburgh, Pa. (Eastern, 462), 3:30 p. m., Special musical program; 6:30, Dinner concert, William Penn Hotel; 7:30, Uncle Kaybee; 7:45, Popular songs, Lew Kennedy; Irene Setzler, pianist; 8:30, Musical program.

WCAL, Northfield, Minn. (Central, 360), 12:00 midnight, Concert.

WCX, Detroit, Mich. (Eastern, 517), 4:15 p. m., Albion College Glee Club; 6:00, Dinner concert, Hotel Tuller.

WDAF, Kansas City, Mo., Star (Central, 411), 3:30-4:30 p. m., Musical matinee, Riley-Ehrhart dance and concert orchestra; 6:00-7:00, School of the Air; Piano tuning-in number, Duo-Art; Address Edgar Linton, writer and lecturer of Kansas City; Tell-Me-a-Story Lady; Fritz Hanlein's Trianon Ensemble; 11:45 p. m.-1 a. m., Nighthawk frolic, "Merry Old Chief," and the Coon-Sanders Orchestra; Louis Forbstein's Royal Syncopators.

WDAP, Chicago, Ill. (Central, 360), 7:00-8:30 p. m., Drake Ensemble and Blacksone Quintet; 10:00, Tom Mallee, Jack Little, Harmony Girls, Bob Brown, Betty Holmes, Jack Chapman's Orchestra.

WDAR, Philadelphia, Pa. (Eastern, 395), 11:45 a. m., Daily Almanac; 12:02, Organ recital; Stanley Theater; 12:30, Arcadia Cafe Concert Orchestra; 2:00, Arcadia Cafe Concert Orchestra; 4:30, Cotton Pickers' Orchestra; 7:30, Dream Daddy's bedtime stories.

WEAF, New York, N. Y. (Eastern, 492), 1:45 p. m., After-luncheon speeches from Foreign Policy Association; 4:00, Mount Royal Orchestra; 5:00, Helen Larkin, soprano; 7:00, Raymond Baird, saxophonist; 7:15, Alice Ralph Wood, soprano, and Mrs. Francis W. Hafner, pianist; 8:00, Billy Jones and Ernest Hare; 8:30, Brooklyn Eagle News review; 9:00, Evercady program; 10:00, Josiah B. Free, baritone; 10:30, Health speakers; 11:00, Vincent Lopez Orchestra.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., Address, Capt. S. C. Kile, Supt. United States Veterans' Bureau; 8:30-9:30, Piano recital, Viola Beck Van Katwijk; 11:00-12:00, Dance music by Adolphus Hotel Orchestra, Lawrence Morrell, director.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Meyer Davis Bellevue Stratford Concert Orchestra; 6:05, Sunny Jim's bedtime stories; 6:30, Meyer Davis Bellevue Stratford Concert Orchestra; 8:00, Medical talk, Dr. Charles F. Nassau; 9:00, International Sunday School Lesson, Dr. W. T. Ellis; 10:10, Charlie Kerr and his Symphonic Dance Orchestra from Majestic Hotel.

WGI, Medford Hillside, Mass. (Eastern, 360), 12:00 m., Wilfred J. Kelley broadcasting Paul Revere's message; 7:00 p. m., Meeting of the Amrad Big Brother Club; 7:30, Patriotic program; Musicale.

WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1:00 p. m., George Albert Bouchard, organist; 2:30-4:00, The Radio Dealers musical program; 6:00-7:30, Chamber music recital, featuring Grace Atwood, reader.

WGY, Schenectady, N. Y. (Eastern, 380), 9:30 p. m., Dance music, Romano's Orchestra.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Walnut Theater Orchestra; Benedict Pike, violinist; 7:30-9:00, Concert, auspices Reginald Billin; Reading, "An Interesting Historical Episode."

WHB, Kansas City, Mo., Sweeney School (Central, 411), 12:35-1:00 p. m., Popular program, Sweeney Radio Orchestra; 2:00-3:00, Ladies' hour program, Sweeney Radio Orchestra; 3:00, Weather and market information.

WIP, Philadelphia, Pa. (Eastern, 509), 1:00 p. m., Gimbel Brothers Tea Room Orchestra; Recital, Karl Bonawitz; 3:00, WIP Male Quartet; 6:05, Harold Leonard's Redjackets from Club Madrid; 7:00, Uncle Wip's bedtime stories; 9:30, Talk, "Spring Preparation of Tennis Courts," A. W. Basford; 10:10, Harold Leonard's Redjackets from Club Madrid.

WJZ, New York, N. Y. (Eastern, 455), 3:00 p. m., Popular songs, L. Wolfe Gilbert; 3:15, George E. Planck, tenor; Erva Giles, accompanist; 3:30, Chet Frost's Bostonians; 4:00, Hotel Belmont Stringed Ensemble, Harry Lerner, leader; 5:00, Cordes Marks, Dance Orchestra; 7:00, Howard Garis' "Uncle Wiggily Stories;" 7:10, Songs, Mary Ellis, Rudolf Friml; 7:30, Leake and Watts Boys' Band; 8:00, Hon. Florello H. La Guardia; 8:30, "Ben Disraeli," George L. Chesterton; 8:45, Mayor Hylan's People's Concert; 9:55, Eunice Howard, Georgiana Martinez, pianists; 10:30, "Is Jazz the Great American Art?" Gilbert Seldes.

WLAG, Minneapolis-St. Paul, Minn. (Central, 417), 10:45-11:15 a. m., Household hints; 11:35-12:00 a. m., Surprise hour; Meeting Postcard Club, E. R. Buell, president; 7:30-8:15 p. m., Business message; 9:15-10:15, Musical program, Great Northern Glee Club; 10:15-12:30, Dance program, Casino Orchestra from St. Paul Hotel, Sam Helman, director; A. E. Salinger, baritone; Wm. Herrmann, accompanist.

WMAQ, Chicago, Ill. (Central, 447.5), 8:00 p. m., Band concert, 132d Infantry Band; 9:00, Balaban & Katz Chicago Theater revue.

WMC, Memphis, Tenn. (Central, 500), 8:30 p. m., Program, Britling Cafeteria, Prof. Chin Chin, director.

WOAW, Omaha, Neb. (Central, 526), 6:30 p. m., Dinner program, Blackstonian orchestra; 9:00, Program, arranged by Clinton R. Miller; Phyllis Wheeler, pianist; D'Anna Donnelly, soprano; Strawn Sisters, instrumental trio; Louise Schnauber, violinist; Jean Stirling, pianist; Mrs. Charles C. Cope, Jr., soprano; Ray Sage, baritone; Gus Swanson, bass; Recitation, Charles R. Docherty; E. L. Kester, baritone.

Where to Hear Dramas

DRAMAS, humorous, serious, musical comedies and even operettas are broadcast during the week and below are the stations and dates.

Tuesday: KHJ, A Play, Pasadena Community Broadcasters; WLAG, "Suicides," WLAG Players.

Wednesday: WLW, "If Wishes Were Horses," Junior Show Shop Players.

Thursday: WGY, "Passers By," WGY Players.

Friday: WDAR, Playlet, WDAR Players.

Saturday: KGO, "The Pipers," KGO Players.

WOC, Davenport, Iowa (Central, 484), 12:00 m., Chimes concert; 3:30 p. m., "Synthetic Perfumes and Flowers," C. C. Hall; 5:45, Chimes concert; 6:30, Sandman's visit; 9:00, Musical selections, the Palmer School Radio Orchestra, Erwin Swindell, conductor; V. B. Rochte, baritone solist.

WOO, Philadelphia, Pa. (Eastern, 509), 11:00 a. m., Organ recital, Mary E. Vogt; 12:02 p. m., Wanamaker's Crystal Tea Room Orchestra, Robert E. Golden, director; 4:45 p. m., Organ recital, Mary E. Vogt.

WDQ, Kansas City, Mo., Western Radio Co. (Central, 360), 7:00-7:45 p. m., Edison recreation program, service announcements and educational talk; 8:00-9:30, Regular Hanley Photo and Radio Shop program, Dillard-Gregg Novelty Orchestra; 11:00 p. m.-12:00 m., church services, Unity School of Christianity.

WOS, Jefferson City, Mo. (Central, 440.9), 11:00 p. m., Special program, Glee Club of Westminster College of Fulton.

WRC, Washington, D. C. (Eastern, 469), 6:00 p. m., Children's hour, Peggy Albion; 7:45, Bible talk, auspices of the Men's Organized Bible Class; 8:00, Dance program, McWilliams' orchestra; 9:00, Piano recital; 9:15, Song recital, Anna Brett Summy, contraltor; 9:30, Violin recital; 10:00, Song recital.

WTAM, Cleveland, Ohio (Eastern, 390), 8:00 p. m., Dance program by WTAM Dance Orchestra, assisted by Y. M. C. A. Minstrels; Solos by Joseph Kuhn, Edson Hill, Jack Clemmons, Tom Lydyard, and Gerald Forstner.

WWJ, Detroit, Mich. (Eastern, 517), 8:00 a. m., Setting-up exercises, R. J. Horton; 12:00 m., Edward Barnes, baritone; LeRoy DeTurk, tenor; 3:00 p. m., News Orchestra; 7:00, News Orchestra.

Sunday, April 20

CKAC, Montreal, Canada (Eastern, 425), 4:30 p. m., Sacred concert.

KDKA, E. Pittsburgh, Pa. (Eastern, 326), 11:00 a. m., Services, Point Breeze Presbyterian church, Rev. Percival H. Barker; 2:45 p. m., Concert; 4:00, Organ recital, Dr. Charles Heinroth; 4:45, Vesper services, Shadyside Presbyterian Church, Rev. Hugh T. Kerr; 6:30, Dinner concert, Pittsburgh Athletic Association Orchestra, Gregorio Scalzo, director; 7:45, Services, Calvary Episcopal church, Rev. E. J. Van Etten; 9:15, Open forum, Rev. John Ray Ewers.

KFI, Los Angeles, Calif. (Pacific .469), 10:00-10:45 a. m., Service by the L. A. Church Federation; 4:00-5:00 p. m., Vesper concert by courtesy of Federated Church Musicians; 6:45-7:30, Concert; 8:00-9:00, Ambassador Hotel concert; 9:00-10:00, Examiner concert, 10:00-11:00, Orcheatra concert.

KFSG, Los Angeles, Calif. (Pacific, 278), 10:30 a. m.-12:30 p. m., Entire devotional service by Aimee Semple McPherson; 2:30-4:30 p. m.; Entire devotional message of worship by Aimee Semple McPherson; 6:30-6:55, Children's hour, conducted by Mrs. M. Kennedy; 7:00-10:00, Special concert of sacred music, followed by revival services conducted by Aimee Semple McPherson; 10:02-10:10, The family altar and prayer, conducted by the pastor; Angelus Temple chimes will ring KFSG off the air.

KGW, Portland, Ore. (Pacific, 492), 6:00 p. m., Church services, First Presbyterian church, Rev. Harold Leonard Bowman, pastor; 7:00, George Olsen's Concert Orchestra; 8:00, "Seven Last Words of Christ." St. Mary's Cathedral Choir.

KHJ, Los Angeles, Calif. (Pacific, 395), 10:00 a. m., Sermon in KHJ Studio; 10:30 a. m.-12:30 p. m., Organ recital and service from First Methodist Episcopal Church, Arthur Blakeley, organist, Rev. E. E. Helms, pastor; 7:00-7:30, Organ recital from First Methodist Episcopal church, Arthur Blakeley, organist; 8:00-10:00, Special de luxe program.

KPO, San Francisco, Calif. (Pacific, 423), 11:00 a. m.-12:00 m., Radio church services, "Easter Questions Divinely Answered," Rev. W. C. Sherman; Etta Wilson, soprano; Norman Simon, baritone; Festo Aspre, violinist; College Male Quartet; 8:30-10:00, Rudy Seiger's Fairmont Hotel Orchestra.

KYW, Chicago, Ill. (Central, 536), 7:00 p. m., Chicago Sunday Evening Club; Mrs. Rose Lutiger Gannon, vocalist; Stanley, organist; choir of 100; Informal Biblo talk, Clifford W. Barnes; Address, Rev. Charles W. Gilkey.

WAAW, Omaha, Neb. (Central, 360), 8:00 p. m., Bridge service, Cross Lutheran church, Rev. Titus Lang, pastor.

WBAP, Fort Worth, Texas (Central, 476), 11:00 a. m.-12:15 p. m., Services, First Methodist church, Rev. J. W. Bergin, pastor; 4:00-5:00, Organ concert, Margaret Agnew White; 11:00-12:00, Popular concert, Fred Cahoon's WBAP Southern Serenaders Orchestra.

WCAL, Northfield, Minn. (Central, 360), 6:00 a. m., Easter morning service, Dr. L. W. Boe, speaker; Grace Holstad, soprano; Ella Hjertaas, contralto; R. Comfort Hinderlie, pianist; 8:30 p. m., Sacred program, Dra. Martin Hegland, speaker; Adolph Engstrom, tenor; Mrs. Neil Drake, pianist; Mrs. Adolph Egstrom, accompanist.

WCX, Detroit, Mich. (Eastern 517), 10:00 a. m., Services Central M. E. Church, Dr. Lynn Harold Hough, pastor; Guy C. Filkins, organist; Hudson Quartets; 2:00 p. m., Radio chapel services.

WDAF, Kansas City, Mo., Star (Central, 411), 4:00-5:00 p. m., Vesper service by the choir and pastor of University Methodist church, Kansas City, Kas.

WDAP, Chicago, Ill. (Central, 360), 5:00-6:00 p. m., Ralph Emerson, organist; 9:15, Phyllis Serndold, soprano.

WDAR, Philadelphia, Pa. (Eastern, 395), 2:00 p. m., Arcadia Cafe Concert Orchestra, direction Feri Sarkozi, in program of popular classical selections.

WEAF, New York, N. Y. (Eastern, 492), 2:45 p. m., New York Federation of Churches; 3:45, Dr. S. Parkes Cadman; 7:20, Capitol Theatre Orchestra; 9:00 Skinner organ recital.

WFAA, Dallas, Texas (Central, 476), 6:00-7:00 p. m., Radio Bible class, Dr. William M. Anderson, Jr.; 9:00-9:30, Universal Male Quartet, Maurice Peterman, leader; 9:30-11:00, Popular music, Jack Gardner's Orchestra.

WFI, Philadelphia, Pa. (Eastern, 395), 7:30 p. m., Services from Arch Street Presbyterian church.

WGI, Medford Hillside, Mass. (Eastern, 360), 4:00 p. m., Concert, Miriani Bunson and assisting artists; 8:30, Concert, choir of West Medford Baptist church, C. E. Dockrill.

WGR, Buffalo, N. Y. (Eastern, 319), 3:00 p. m., Easter service, Rev. Don Tullis, executive secretary, Buffalo Federation of Churches, speaker; 4:00, Robert M. Munn, organist.

WGY, Schenectady, N. Y. (Eastern, 380), 11:00 a. m., Services, St. Peters Episcopal church, Rev. Charles E. Harriman, pastor; Dr. Frank Sill Rogers, organist; 2:30 p. m., WGY Symphony Orchestra; Carl N. Jester, tenor; 4:00, St. Peter's Episcopal church; 7:30, Madison Avenue Reformed church, Rev. Richard E. Locke, pastor; Florence Jubb, organist.

WHAA, Iowa City, Iowa (Central, 484), 9:00 p. m., Familiar hymns, Mrs. George C. Albright.

WHAS, Louisville, Ky. (Central, 400), 9:57 a. m., Organ music; 10:00, Church service, Rev. Dr. Richard T. Gilleaple; Margaret McLeish, organist; 4:00-5:00, Concert, Mrs. Jane Webster Murrell.

WHB, Kansas City, Mo., Sweeney School (Central, 411), 2:00-3:00 p. m., Classical program, Sweeney Radio Orchestra, special sermonette; 8:00-10:00, Church aerrices, Independence Boulevard Christian church, followed by musical numbers, Sweeney Radio Orchestra; 12 m.-1 a. m., Special program, Sweeney Radio Orchestra, for extreme west listeners.

WHK, Cleveland, Ohio (Eastern, 283), 8:00 p. m., Selections, WHK Orchestra; Solo numbers, favorite entertainers.

WLW, Cincinnati, Ohio (Central, 309), 9:30 a. m., School, Editorial staff of Sunday School Publications, Methodist Book Concern; 11:00, Services, Church of the Covenant, Dr. Frank Stevenson, minister; 7:30 p. m., Church services, First Presbyterian church, Rev. Fred K. McMillan, minister; 8:15, Concert, Western and Southern Orchestra, William Kopp, director.

WOQ, Kansas City, Mo., Western Radio Co. (Central, 360), 11:00 a. m., Regular church service broadcast by remote control; 7:00-9:00, Classical program of violin, piano and vocal numbers.

WOS, Jefferson City, Mo. (Central, 440.9), 7:30 p. m., Church services, First Christian church, Rev. Robert M. Talbert, pastor; Prof. Siebert Price, organist; Mrs. Fred Beagle, violinist.

WWJ, Detroit, Mich. (Eastern, 517), 5:00 p. m., News Orchestra; 7:30, Services, St. Paul's Cathedral.

Monday, April 21

CKAC, Montreal, Canada (Eastern, 425), 1:45 p. m., Mt. Royal Hotel Concert Orchestra; 4:00, Weather, news, stocks; 4:30, Mount Royal Hotel Dance Orchestra.

KDKA, E. Pittsburgh, Pa. (Eastern, 326), 12:15 p. m., Noon concert; 6:15, Organ recital, Howard Webb, 7:15, "A Look Ahead Toward Oncoming Events," "Our World;" 7:30, Children's period; 8:00, Radio Girl Scout Meeting, Laura Holland, director; 8:15, "Political Parties from Grant to Wilson," Dr. John W. Oliver; 8:30, KDKA Little Symphony Orchestra.

KFAE, Pullman, Wash. (Pacific, 330), 7:30 p. m., Agricultural engineering talk, Prof. C. C. Johnson; "The Peace Movement to 1914," Prof. C. H. Woody; "Cow Testing and Its Value," Don G. Magruder; Mrs. La Verne Askin Kimbrough, contralto; Mrs. Ruth Keiser, pianist.

KFAF, Denver, Colo. (Mountain, 360), 8:30 p. m., "Fishing in Colorado," R. G. Parvin, State Fish and Game Commissioner.

KFI, Los Angeles, Calif. (Pacific, 469), 8:00-9:00 p. m., Evening Herald concert; 9:00-10:00, Examiner concert; 10:00-11:00, Ambassador-Max Fischer Cocoauut Grove Orchestra.

KFOA, Seattle, Wash. (Pacific, 455), 8:30 p. m., Pacific States Electric Company program presenting Bab's B.B. Ladies' Orchestra, Margaret Dicken, leader.

KGW, Portland, Ore. (Pacific, 492), 3:30 p. m., Literary program, Portland Library Association; 7:00, Talk, Florence Holmes Gerke; 8:00, Joiut harp recital, Ruth Lorraine Close, Helen Martin; 9:30, Portland Civic Music Club.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Special Concert program.

KPO, San Francisco, Calif. (Pacific, 423), 1:00-2:00 p. m., Rudy Seiger'a Fairmont Hotel Orchestra; 2:30-3:30, Jack Fait'a Entella Cafe Orchestra; 4:30-5:30, Rudy Seiger's Fairmont Hotel Orchestra; 5:30-6:30, "Big Brother" of KPO; Natalie Heymann, violincellist; 7:00-7:30, Rudy Seiger'a Fairmont Hotel Orchestra; 8:00-9:00, Theodore J. Irwin, organist; Mme. Natalie Albini, soprano; Mrs. Raymond Marshall, soprano; 9:00-10:00, Neyda Houx, soprano; Nazaretti Regoli, tenor; Miss Cole, Mischa Lhevine, pianist; Lilly Stadd, soprano; 10:00-11:00, E. Max Bradfield's Versatile Band.

WAAW, Omaha, Neb. (Central, 360), 7:30-9:00 p. m., Roy Watsou's Wild Rose Orchestra; Charles Lang, baritone; Clara Stieden, Laurette Voss.

WBAH, Minneapolis, Minn. (Central, 417), 12:30-1:30 p. m., Dick Long's Trio and soloist; 9:30-11:00 p. m., Minneapolla Chapter Isaak Walton League of America, Out-door American Radio program, A. M. Wilcox, director.

WBAP, Fort Worth, Texas (Central, 476), 7:30-9:30 p. m., Concert, John Tarleton College; 9:30-10:45, Concert, Orchestra of Bowie.

WBAV, Columbus, Ohio (Eastern, 390), 12:00 m., Piano music, Ila Lorbach Owens; News; 8:00 p. m., WBAV Orchestra, direction Miss Frances Handibeau.

WCBD, Zion, Ill. (Central, 345), 8:00 p. m., Vocal duets, Mrs. J. D. Thomas, Mrs. H. E. Mayfield; Mark Whitside, baritone; Esther Wlemand, soprano; Mrs. Ruth Pihl, soprano; Arthur Rendall, clarinetist.

WCX, Detroit, Mich. (Eastern, 517), 4:15 p. m., Music; 6:00, Dinner concert, Hotel Tuller; 8:30, Musical program.

WDAF, Kansas City, Mo., Star (Central, 411), 3:30-4:30 p. m., Musical matinee, Milo Finley's Orchestra; 6:00-7:00 p. m., School of the Air; Piano tuning-in number, Duo-Art; Address, speaker, the University of Kansas; Address, personal message from Roger Babson, business authority; Tell-Me-a-Story Lady; Fritz Hanlein's Trianon Ensemble; 8:00-9:15 p. m., Classical program arranged and presented by students of the St. Agnes Academy; 11:45 p. m.-1 a. m., Nighthawk Frolic, "Merry Old Chief" and Coon-Sanders Orchestra.

WDAR, Philadelphia, Pa. (Eastern, 395), 11:45 a. m., Daily Almanac; 12:02 p. m., Organ recital, Stanley Theater; 12:30, Arcadia Cafe Concert Orchestra; 2:00, Arcadia Cafe Concert Orchestra; 4:30, Edna Finestone, pianist; 7:30, Dream Daddy's bedtime stories; 8:00, Talk by Samuel Lacier; Special features from Stanley Theater; Stanley Symphony Orchestra, direction Josef Pasternack; 10:10, Howard Lanin's Arcadia Cafe Dance Orchestra.

WEAF, New York, N. Y. (Eastern, 492), 4:00 p. m., Carlo Restivo, accordion; 4:30, Lemuel Kilby, baritone; 5:00, Mothera' program; 7:00, Veruice Gay, pianist; 7:30, Thornton Fisher; 7:40, Charles Wold and his Musical Glasses; 8:00, Talk on clocks; 8:10, Pat O'Reilly, baritone; 8:30, Program by Hall & McNamara; 8:40, Jane Thomas, lyric soprano; 8:50, Talk by Lawyers Mortgage Co.; 9:00, Vernice Gay, pianist; 9:30, Gypsy String Ensemble.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., Address, Prof. J. D. Boon, "Practical Astronomy"; 8:30-9:30, Hugh Slocum and his dancing orchestra.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Meyer Davis Bellevue Stratford Concert Orchestra; 6:00, Sunny Jim's bedtime stories; 6:30, Meyer Davis Bellevue Stratford Concert Orchestra.

WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1:00 p. m., George Albert Bouchard, organist; 2:30-4:00, The Radio Dealers' Musical program; 6:30-7:00 and 11:30, Vincent Lopez Hotel Statler Orchestra (individual artists' night); 8:50-9:00, Address, "Public School Finance," Charles B. Hill; 9:00-9:10, Piano solo, Ruth Beuthel; 9:10-8:20, Soprano solo, Gertrude Snyder; 9:20-9:30, Tenor, solo, Irving Liberman, piano and violin accompaniment; 9:30-9:35, Piano solo, Ruth Beauthel; 9:10-9:20, Soprano solo, Gertrude Snyder; 9:45-10:15, C. Leone and John Drello, vocal duets in Italian with guitar accompaniment; 10:15-10:30, Tenor solo, Irving Liberman; 10:30-10:45, Reading, Esthermae Clark; 10:45-11:00, Bsritone solos, C. L. Gifford.

WGY, Schenectady, N. Y. (Eastern, 380), 2:00 p. m., "Fashion Don'ts for Full Figures," Robert L. Smith; 7:45, Albany Brass Quartet; Estelle Rogers, soprano; Cornet and trombone duet, Robert Maitland, Fred Malpass; Frederick Clinnick, cornetist.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Walnut Theater Orchestra; Strand Theater Orchestra.

WHAZ, Troy, N. Y. (Eastern, 380), 9:00 p. m., Concert, Beman Park Neighborhood Association, women's quartet; 9:45, Gardeu talk, John Jeannin, Jr.; 10:00, Concert, Troy Salvation Army Silver Band.

WHB, Kansas City, Mo., Sweeney School (Central, 411), 12:35-1:00 p. m., Popular program, Sweeney Radio Orchestra; 2:00-3:00 p. m., Ladies' hour program, Sweeney Radio Orchestra; 7:00-7:45 p. m., Educational program for children, Lenore Anthony, "Book of Knowledge Lady."

WIP, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Gimbel Brothers' Tea Room Orchestra; 3:00, Easter Cantata; 0:05, "Baseball Dope" by Monte Cross, 6.15 p. m., St. James Hotel Dinner Dance Orchestra; 7:00, Uncle Wip's bedtime stories.

WLAG, Minneapolis-St. Paul, Minn. (Central, 417), 10:45-11:15 a. m., Household hints; 11:35-12:00 m., Surprise hour; 2:00-2:30 p. m., "20th Century Housekeeping," Bernice Bell; 2:40-4:00, Daylight concert; 4:00-4:30, Magazine reading; 5:30-6:00, Children's hour, Tess Cooperman; 6:00-6:15, "Sport Review," John Getchell; 6:15-7:00, Dinner concert; 7:30-8:15, Farm lectures, "Area Plan for Eradicating Tuberculosis," W. A. Peck; "Modern Banking," J. G. MacLane.

WLW, Cincinnati, Ohio (Central, 309), 8:00 p. m., Concert, Lions Club Quartet; Edgar Guest's poema, Margaret M. Bryan; Prize Chorus of the Evanston Mother's Club; 9:30, Crosley theatrical review; Woody Meyer's Cincinnati Dance Orchestra.

WMAQ, Chicago, Ill. (Central, 447.5), 4:30 p. m., Concert.

WMC, Memphis, Tenn. (Central, 500), 8:30 p. m., Hotel Gayoso Orchestra.

WOD, Philadelphia, Pa. (Eastern, 509), 11:00 a. m., Organ recital, Mary E. Vogt; 12:02 p. m., Wanamaker Crystal Tea Room Orchestra, Robert E. Golden, director; 4:45, Organ recital, Mary E. Vogt; 7:30, Hotel Adelphia Concert Orchestra; 8:00, Health Talk, direction Bureau of Public Health of Philadelphia; 9:10, Fox Theater Grand Orchestra, Erno Rapee, director; 10:30, Havana Casino Dance Orchestra, Vincent Rizzo, director.

WOQ, Kansas City, Mo., Western Radio Co. (Central, 411), 7:00-8:00, Edison Recreation program.

WOS, Jefferson City, Mo. (Central, 440.9), 8:00 p. m., Missouri State Prison Orchestra; Harry M. Snodgrass, pianist, "King of the Ivories."

WWJ, Detroit, Mich. (Eastern, 517), 8:00 a. m., Setting-up exercises, R. J. Horton; 12:00 n., Music; 3:00 p. m., News Orchestra; 7:00, Musical program.

Tuesday, April 22

CKAC, Montreal, Canada (Eastern, 425), 4:00 p. m., Music; 7:00, Kiddies' stories in French and English; 7:30, Rex Battle and his Mt. Royal Hotel Concert Orchestra; Herbert Spencer, organist; 8:30, La "Presse" studio variety entertainment; 10:30, Joseph C. Smith and his Mt. Royal Hotel Dance Orchestra.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., Concert; 8:00-9:00, Ambassador-Max Fischer Cocoanut Grove Orchestra; 9:00-10:00, Examiner concert; 10:00-11:00, Concert.

KGO, Oakland, Calif. (Pacific, 312), 8:00 p. m., Paradise Hawaiian Trio; Geraldine Jackson, soprano; William and Bonita Keasbey, pianists; Reading, "The Forgotten Actor," Richard Mill; The Rose Florence Ladies' Quartette; "The Joys of Spring," Otto Biehl; Leslie H. Jackson, baritone; Norma MacPherson, pianist; Vocal selections, Reva T. Ker, Irene Carroll, Janie Johnston, Emily Beal; Lenore Keithley, vocalist; Martha Jalava, vocalist.

KGW, Portland, Ore. (Pacific, 492), 12:30 p. m., Concert, Civic Music Club of Portland; 3:30, Talk, Jeanette P. Cramer; 7:45, Talk for farmers, Oregon Agri. College extension service.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Concert; 2:30-3:30, Matinee Musicale through courtesy of Barker Brothers; 6:45-7:30, Children's program; Bedtime story, "Uncle John"; 8:00-10:00, Special De Luxe program of vocal and instrumental selections.

KPO, San Francisco, Calif. (Pacific, 423), 1:00-2:00 p. m., Rudy Seiger's Fairmont Hotel Orchestra; 2:30-3:30, Organ recital, Theodore J. Irwin; 4:30-5:30, Rudy Seiger's Fairmont Hotel Orchestra; 5:30-6:30, Stories from the Book of Knowledge, Big Brother of KPO; 6:30-7:00, "Cleveland Six" Orchestra; 7:00-7:30, Rudy Seiger's Fairmont Hotel Orchestra; 8:00-10:00, Orpheus Club of Oakland; 10:00-11:00, E. Max Bradfield's Versatile Band.

WBAP, Fort Worth, Texas (Central, 476), 7:30-8:30 p. m., Concert, Frank Cheek, baritone; 9:30-10:45, Monthly program, Fort Worth Harmony Club.

WBAV, Columbus, Ohio (Eastern, 390), 12:00 m., Piano music, Ila Lorbach Owens.

WDAP, Chicago, Ill. (Central, 360), 7:00-8:00 p. m., Drake Ensemble and Blackstone Quintet, 10:00, Rosemary Hughes, Bob Cougle, Fred W. Agaard, Jack Chapman's Orchestra.

WDAR, Philadelphia, Pa. (Eastern, 395), 11:45 a. m., Daily Almanac; 12:02 p. m., Organ recital, Stanley Theater; 12:30, Arcadia Cafe Concert Orchestra, 2:00, Arcadia Cafe Concert Orchestra; 7:30, Dream Daddy's bedtime stories; 7:50, Play review, Arnold Abbott.

WEAF, New York, N. Y. (Eastern, 492), 11:15 a. m., Board of Education; 11:35, Motion picture talk; 1:45 p. m., Associated Press luncheon speeches; 4:00, Geraldine Samson, soprano; 4:15, Della Biordan, lady baritone; 4:45, Helen Drew, pianist; 5:00, Children's hour stories; 7:00, Chris Meehan, tenor; 7:15, Joseph Moskowitz, cymbalon; 7:30, Thornton Fisher; 7:40, Bella Gerard, contalto; 8:00, Corn Products Refining Orchestra; 8:30, Brooklyn Eagle news review; 9:00, Leroy Fisher, baritone; 9:30, Florence Gilmour, Coloratura soprano; 9:45, Eveready program; 10:30, Hospital Music Committee.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., Address, DeWitt McMurray; 8:30-9:30, Musical program, Mrs. Anna Ledford; 11:00-12:00, Musical recital, G. Haydn Jones and artists.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Meyer Davis Bellevue Stratford Concert Orchestra; 6:00, Sunny Jim's bedtime stories; 6:30, Meyer Davis Bellevue Stratford Orchestra; 10:30, Charlie Kerr and bis Symphonic Dance Orchestra.

WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1:00 p. m., George Albert Bouchard, organist; 2:30-4:00, The Radio Dealers' Musical program; 6:00-7:30, Chamber music recital.

WGY, Schenectady, N. Y. (Eastern, 380), 1:45 p. m., Address, Pres. Calvin Coolidge; 6:30, Dinner music, Instrumental Trio of Hotel Ten Eyck; 7:45, Mountains and Mountain Scenery," Dr. James H. Stoller; 8:00, Farm program; Uncle Josh Quimby will bring the Singing School and Corn

30 Minute A-B-C Lessons for Radio Beginners

Chapter V—What Condensers are Good for

By P. E. Edelman

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

Chapter VI—Uses of Resistance in Radio.
Chapter VII—Essentials of Radio Electricity.
Chapter VIII—The Key to Radio Circuits.
Chapter IX—Radio's Cast of Characters.
Chapter X—What a Vacuum Tube Does.

EVERY receiving set contains one or more condensers. A condenser is a capacity or device for temporarily holding electricity. A large condenser holds a big quantity of electrons much as a gallon jar holds water. A tiny condenser can only hold a small amount of

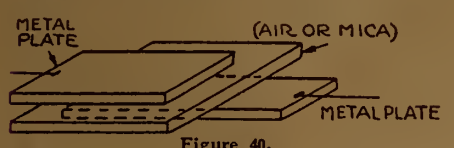
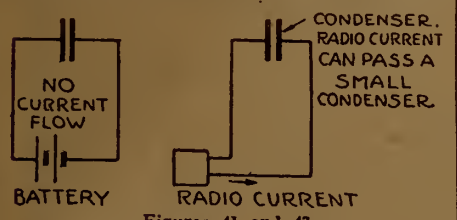


Figure 40.

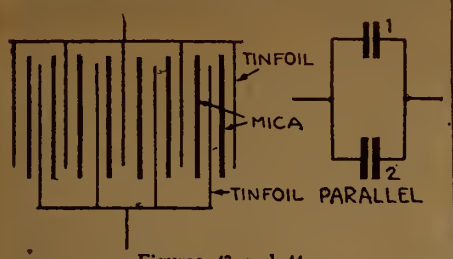
electrons, corresponding for example to a thimble full of water.

Figure 40 illustrates how any two conducting surfaces separated by a dielectric, form a condenser. The dielectric means



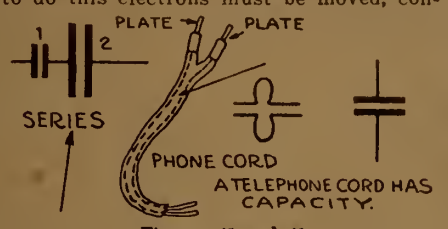
Figures 41 and 42.

the insulator between the metal plates, such as air or mica. When an electric charge is applied, a bunch of electrons rush onto the plate and set up a strain in the dielectric between the two plates. One plate is said to become negatively



Figures 43 and 44.

and the other positively charged. which means simply that there is more electricity on one plate than on the other. Both plates want to be discharged or have an equal quantity of electrons, and to do this electrons must be moved, con-



Figures 45 and 46.

stituting a current. Starting without unequally charged plates, if electrons are added to one plate, it is said to be charged, and the other plate has an equally opposite ability to take away this extra charge. This ability to take away the

Figure 47.

charge from the other plate is called a positive charge. The dielectric is an insulator and prevents the electron flow necessary for equalizing the charge or amount of electrons on each plate. This is then accomplished externally by con-

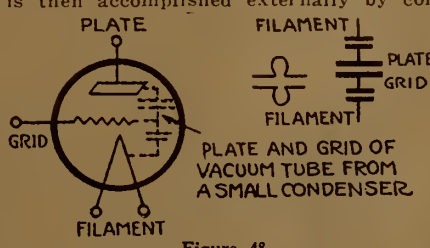


Figure 48.

necting a suitable circuit around the condenser plates.

Charging a Condenser

If a battery is connected to a condenser. it is charged to the same voltage as the battery can give, but no current can

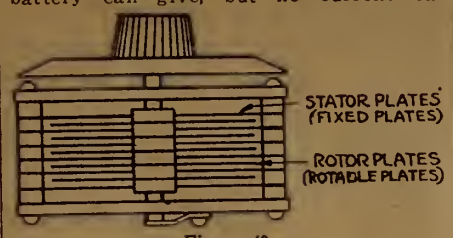


Figure 49.

flow through the condenser. If alternating or Radio current is applied to a condenser, it can however pass right through. The condenser, charges first in one direction and then reversely, following the alternating supply current. thus acting as a temporary reservoir to take and give back electrons in large quantities. This is diagrammed in Figures 41 and 42.

Instead of one plate for each side of a condenser there can be a group sandwiched in between insulating dielectric material, as illustrated by Figure 43. Each group acts as one plate.

Parallel and Series Connections

Two condensers can be connected to make one larger or one smaller condenser.

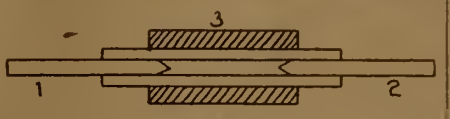


Figure 50.

The parallel connection to give a larger condenser effect is shown in Figure 44, and the capacities of the two condensers simply add together. In the series connection, Figure 45, the combined capacity is always less than the capacity of the smallest individual condenser. Thus in this example the total series capacity is less than the capacity of the smallest condenser alone.

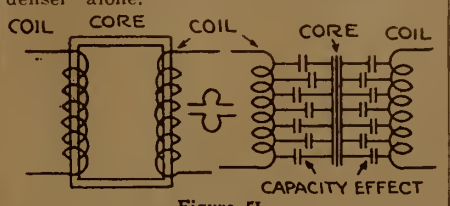


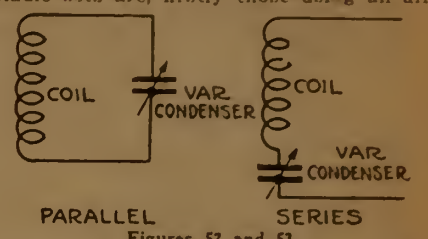
Figure 51.

The two wires in a telephone cord such as used in Radio receiving sets form a considerable capacity, as illustrated in Figure 46. So do two close parallel busbar connecting wires form a tiny Radio condenser, as in Figure 47. Sometimes such tiny condensers can pass considerable Radio frequency current.

Another small condenser is naturally formed in the vacuum tube used in a receiving set, as illustrated in Figure 48.

Types of Condensers

The main types of condensers used in Radio sets are, firstly those using an air



Figures 52 and 53.

dielectric and usually variable or adjustable as to capacity size, and secondly, those using mica or some other solid dielectric material. The latter are more compact and can be fixed or adjustable Air is the unit in measurement of dielectric capacity, and other insulators, as mica, have a much larger dielectric constant. Thus for the same dimensions mica can hold a greater dielectric strain and form a larger capacity condenser than air. Some materials, as paper, are not good dielectric because they absorb and dissipate energy. Figure 49 diagrams the popular type of plate variable condenser and Figure 50 shows one of the smallest.

The windings of an ordinary audio frequency transformer have considerable capacity of condensers in and between

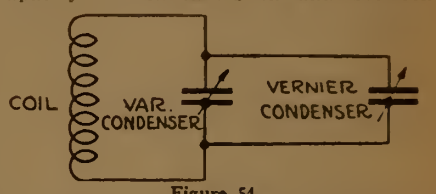


Figure 54.

the windings, as illustrated in Figure 51.

Combinations of Condensers and Coils

Figures 52 and 53 show the two principal connections of a condenser and a coil, as used in tuning. Such combinations become adjustable packages to fit

(Continued on page 22)

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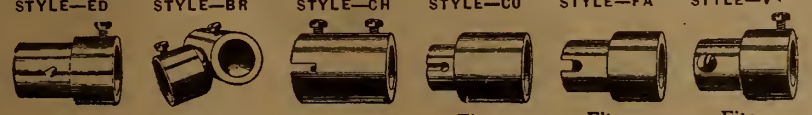

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Government Control Much Needed

Radio Not Unlike Many Other Problems

RADIO has rapidly developed into a great commercial proposition, with sharp competition for control of the element in which it operates. It seeks mouopoly, aud adds a trausportation problem to the questious of the day, for its business profits depend on the transportation of sounds to the ears of the public.

All through our history transportation facilities and privileges have been extremely valuable. Some men uow living remember when good roads meant toll gates and a price to be paid to pass over a bridge and the like because they were privately owned, but business demanded free roads and got them. This was once a laud problem.

The governmeut had to step in once and make the water free. Had it not done so every navigable river and lake, and every seat of water power would have been controlled and owned by private interests. Yet the public has to fight to preserve public rights in water power. This is the water problem.

The last on the list comes Radio for private profit. Just air is left. Shall it remain free? It can be with that freedom which permits no infringement on the rights of the people. Not free to grab and monopolize, but free to use under equal and equitable opportunity guaranteed by the government in its most important function, that of promoting the general welfare and holding it above and prior to any private profit.

It becomes quite natural that the government must control the air as it does the earth and its waters, not as an owner robbing the people of proper business enterprises, but as a power protecting the rights of the people to produce wealth on earth, water and in the air, so long as they do not infringe on the equal rights of the others.

Comparison of Sets

Number of Tubes Has No Meaning in Efficiency

COMPARISONS for the efficiency of a receiver on the basis of the number of tubes does not mean anything and is not a criterion of the possibilities of any set.

In order to get a clear conception of the various systems that are used for the reception of broadcast programs, it is necessary that the fan understand clearly that the transmission from the broadcast station actually consists of two different things—first, the electromagnetic waves, which act as a bond between the broadcast station and the receiving apparatus; second, the waves of electrical current vibrating at audible frequencies which are carried on the electromagnetic waves vibrating at Radio freqùencies.

The distinction between these two is contained in their names: Audio frequency means all of those vibrations which transmuted into sound waves can be heard by the human ear; while Radio frequency covers everything that is above the range of the human ear.

The sensitivity of a set naturally depends upon the means taken to amplify the Radio frequency portion of the waves coming from a broadcast station. All engineers are concentrating on this phase of the development of Radio, but the wise thing is to keep the number of tubes down to practical limits, while improving the overall efficiency of each stage that is used. This is just as true with regard to the regenerative system as to all others. Regeneration consists of Radio frequency amplification, but in this case it is obtained through the medium of the same tube that is employed for detection, and unless the circuits about this tube are efficiently designed and constructed, the best results will not be obtained.

Mushiness Not Always in Set

Broadcasting Stations May Be at Fault

WHEN sounds in your headphones or loud speaker are distorted and "mushy," do not always blame it on the set. The transmitting station may be at fault. If your set brings in three or four stations clear and strong and the fourth and fifth come in "mushy," it's a pretty safe bet that transmission is bad. To attempt to clear up "mushy" broadcasting would be the same as trying to make a sharp, clear copy from a photograph that was "out of focus." It can't be done.

RADIO INDI-GEST

The Radio Announcer's Dream

(Dedicated to C. R. Emery, WGI Director and Announcer.)

The Radio Announcer had a dream; he thought that he had died,
That he had crossed the narrow Styx and reached the other side,
He saw the jasper gates of Heaven loom high upon the shores,
He heard the chantings of the Blest behind the closed doors.

And in the dream he saw himself go boldly forth and knock,
He heard a key by someone held turn softly in the lock,
He heard the hinges groan and creak, the gates flew open wide,
There stood St. Peter with his keys, who said, "You stay outside."

"But why?" the poor Annonncer said, "Why can't you let me in?
I've done no wrong to anyone, I'm free from every sin,
I've lived a model life indeed, my work I have done well,
Why send me, good St. Peter, now into the depths of Hell?"

St. Peter calmly answered him, "Are you the man below
Who made announcements every night upon the Radio?"
"Why yes, but that's no crime," said he. St. Peter said, "Young man,
How many lies did you broadcast, remember if you can?

"Have you not said, 'One minute, please,' and made folks wait fifteen?
And every 'ham' have introduced as the best you'd ever seen?
Have you not said 'I hope you have enjoyed this just as much
As we have here,' and in your heart the lie you knew as such?

"How many poor performers have you told with a straight face
That they were good and yet you knew their work was a disgrace?
Do you remember how you've lied about your microphone?
How you have claimed your station was the finest ever known?

"Do you forget those made-up tales about the 'super-power'
That you were using on the air, you told them by the hour?
And how about those letters that contained a slam or knock?
What awful cuss words you did use when of them you would talk.

"Have you forgotten how you've sung and read to fill up time?
How you have murdered English and made free with honest rhyme?
You have no place among the saints, the Devil takes your kind.
He has a splendid place for you, the hottest he could find."

And then St. Peter slammed the door so loud it shook the skies,
The poor Announcer with the noise awoke and rubbed his eyes,
He vowed that henceforth no such tales he'd tell to raise your ire,
But just between ourselves, my friends, the poet is a liar.

CHARLES L. H. WAGNER.

Mrs. Partington Speaks Out

Dear Indi: Mrs. Partington says she has listened in to another politics lesson in Radio Extension course by W. R. C. at Washington, and she's heard that "The situation, badly distorted at first, is now beyond comprehension of the uninitiated, if not of those who have passed through the middle chamber," and says she don't know but mebbe it is.

She's heard that the accusations is likely to become more complicated before the conventions, while the Static will certainly continue in violence but more centerized from then to the election.

She is pleased to hear that ex-Gen. Dough Herty is not even implicated by any grid leak whatsoever through close relatives or friends in the Rum deal, as they can't prove these folks didn't have no more sense than to mix cheap oil with good whiskey that costs $15 a case just to bail out. SIGNING OFF.

A Reverse Darwin

My neighbor says,
Says he to me:
"Your Radio
Ain't worth a D,"
And now from up
A tall elm tree
He broadcasts: "Save
Oh, Save thou me."

CACTUS JACK.

We Wondered Howcum the Foam on Our Dials

Dear Indi: Didja tune in on the April 5, 8:30 p. m. program from CKAC, La Presse? No? 'Twas the "Famous Frontenac Breweries Band and Artists Direct from the Brewery." Mama said the mushiness was caused by rushing the growler. INNOCENT EYES.

They're Ashamed of 'Em

Dear Indi: I was just thinking that it is a good thing that broadcasting was not in vogue when they were naming Indians, because I know some announcers would have been called Man-That-Is-Afraid-of-His-Call-Letters.

INSU LATION.

With Flowing Currents, Grid Exposure

Clipped by A. W. F.

HOT WATER KENT Radio Set, five tubes, batteries, extra large loud speaker, charger in perfect condition; will sell cheap. Geo. Farrar, Box 317, Iberville, Que. 70 2

Yep, Single, 24, Six Feet, Slender, Brunette, Looking for a Good Home

Dear Indi: Re the contrib headed "Who Gets the Point? Write Indi, He Doesn't," don't you imagine that FRESH MAN means that he hopes there is no increase in the number of Ohms? I guess you are single—a married man could never have failed to see the point. RHEO STAT.

Keeping Out the Strays

Dear Indi: I have an improvement on the 10c wave trap. Get one whose mesh is so fine your neighbor's strays can't crawl through and cause interference, or somebody might hear (or feel) a scratching noise. INS U. LATION.

The King Admires Himself

Condensed

By DIELECTRIC

WGN, the old familiar Chicago station, WJAZ, has become the property of The Tribune, and will broadcast news, music and general information under the direction of this newspaper. Publishers are evincing interest in this system of posting bulletins for all the world to hear, for another paper, The Herald and Examiner, has joined with the farmers' station—WJR—to fill the air in country districts. How does the A. T. & T. control these stations? What are the Radio editorial policies of the A. T. & T.?

I wish Fall had put off his oil deal until the White Radio Control bill had been enacted iuto law. It is really an urgent measure to which you may lend your support by following the directions given in the appeal from the American Radio Association. No matter how busy you or they may be, your Congressmen will pay heed to letters from twenty million fans and it will pay you to write. Don't say "writing to Washington accomplishes nothing," but sit down and DICTATE what you wish done. When Radiophans get sore, Congressmen "fade out." Get busy!

Every now and then we see signs of encouragement for those whose lives must be spent on a bed or in a wheel chair, for the appeal to provide receiving sets in such cases finds some responsive hearts. May the slogan adopted by the Radio shut-in committee of the Dallas, Tex., Rotary Club be taken up by other clubs until "Bringing Sunshine to the Shut-Ins" shall brighten many suffering individuals. Send your set over to a neighbor while you spend the evening in your Radio-less home. Pretty tough? Sure it is; but what of a lifetime in oue room—without a set! Think that over.

One of the surest signs of failure is a box office in a theater with "Standing Room Only" displayed over the window. "Failure," that is, for the argument advanced opposiug broadcasting of theater productions as a sure means of losing patrons. Roxie and his gang have attracted the attention of thousands of fans through their informal Sunday evenings spent by Radio with listeuers in. On their tour recently it was impossible to accommodate all who sought tickets for the performances. If that shows anything, it is the gain to be derived from broadcasting plays aud players for publicity.

It begins to look as if there were other ways to span great distauces via Radio without resort to wired assistance. A short time ago we had the pleasure of listening to a prograau which was relayed through four stations in this country and one in Englaud. KFI, Los Angeles, determined to cross this coutinent and the Atlautic ocean with a program to be heard in the British Isles. KGO and WGY did their bit to boost the concert on its way across with the result that 2LO, Londou, sent a cable with the joyous news of success. Why rent wires? Just Radio the news.

Once agaiu the wily promoters of discord iu music circles have met with rebuff. Not content with attempting absolute control of all musical productions used in broadcasting entertaiumeut, an effort has been made to have musiciaus exact an exorbitant sum from any station transmittiug union music. The one is failing rapidly; the other has failed completely. While in a studio the standard union rate will prevail. When playing elsewhere there will be no extra charge for station broadcasting. There are some even [illegible] the music world.

New Simple and Compact Radio Receiving Set

Part II—Main Panel Layout for Harkness Neutroflex Set

By H. J. Marx

THE layout of the panel is shown in Figure 2. The location of the two condensers are shown by center line only. The mounting holes can be laid out and drilled according to the apparatus used. This also holds true of the two rheostats, the panel mounting angles, jack and the holes used for fastening the panel into the cabinet.

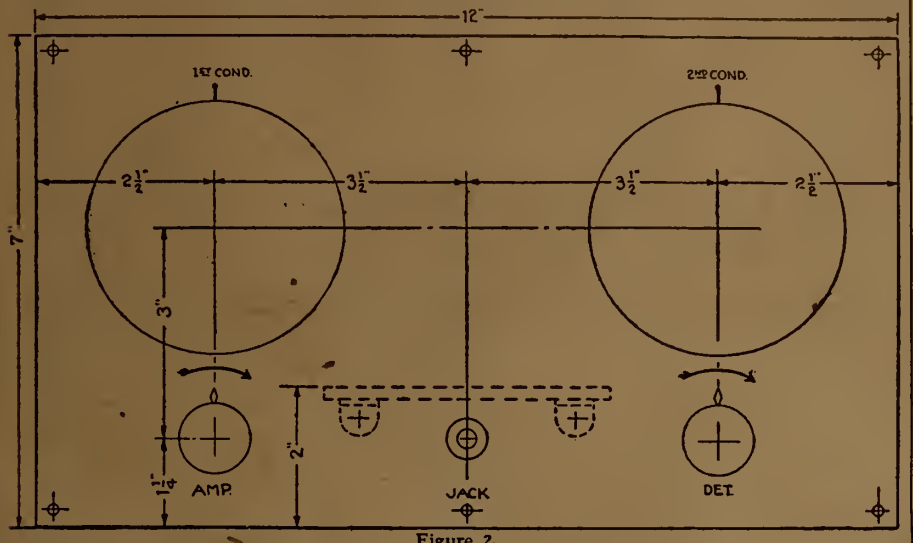

Figure 2.

The amplifier rheostat is on the left side under the first condenser, whereas the detector or two element tube rheostat is on the right side under the second condenser. The jack is in the center in line with the two rheostats to make neater appearance.

Sub-panel Layout

The layout of the sub-panel is shown in Figure 3. Here again only center line locations are given since the dimensions of the mounting holes depend entirely upon the parts used. The clearance of the sub-panel over the two condensers in the coils is sufficient to take care of almost any type of variable condenser. Ample room is provided for the location of the two audio frequency transformers.

Dimensions of standard tube sockets are fairly uniform so that their location will fit in well regardless of the type used.

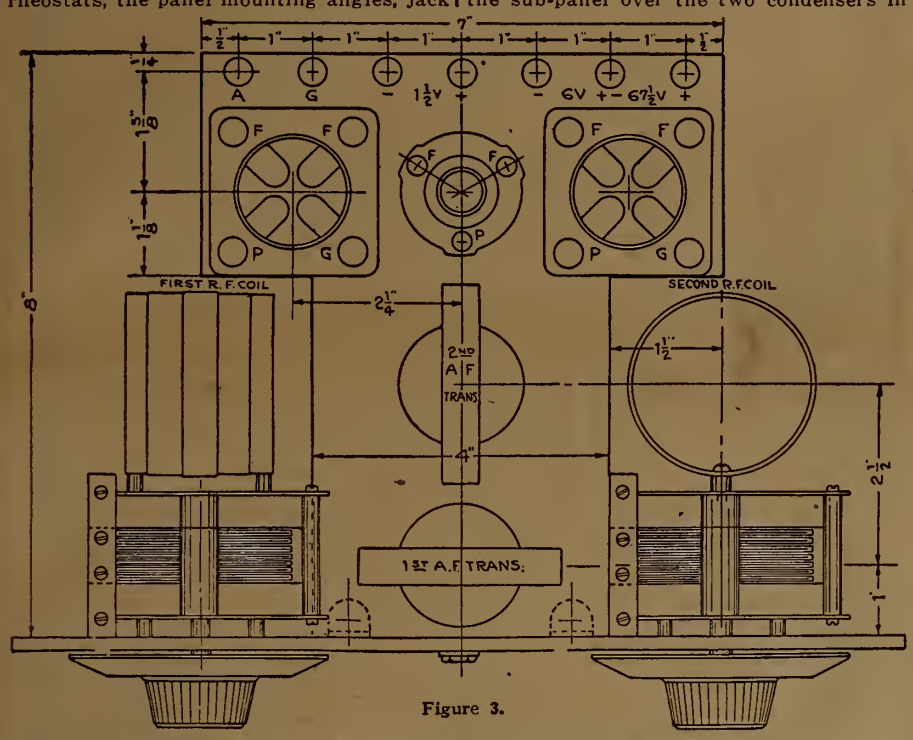

Figure 3.

All binding posts are kept in the rear of the sub-panel and it should be noticed that the arrangement in Figure 3 corresponds to the layout of these binding posts as shown in Figure 1, last issue. The socket for the two element tube is located centrally between the two amplifier tubes. All filament terminals on these sockets should face toward the rear and the binding posts so as to shorten all filament leads as much as possible and keep the plate and grid leads close to the Radio and audio frequency transformers located in the front. This will permit shortest possible wiring with minimum amount of interference.

First Radio Frequency Coil

Figure 4 shows the first Radio frequency coil and consists of two windings. The first or lower layer has 80 turns of number 24 ssc. wire, over this a strip of paper is then wound in a single layer. On this paper is wound 20 turns of the same wire running in the same direction which makes up the primary winding. The use of adhesive coatings is not recommended. If possible it is suggested that the primary winding be spaced in order to reduce capacity. This is not absolutely essential.

Second Radio Frequency Coil

The second coil, which varies slightly from the first, is shown in Figure 5. In this coil the secondary winding again consists of 80 turns as above, but the primary winding has 60 turns. In both coils all windings should run in the same direction. These coils are mounted on the ends of

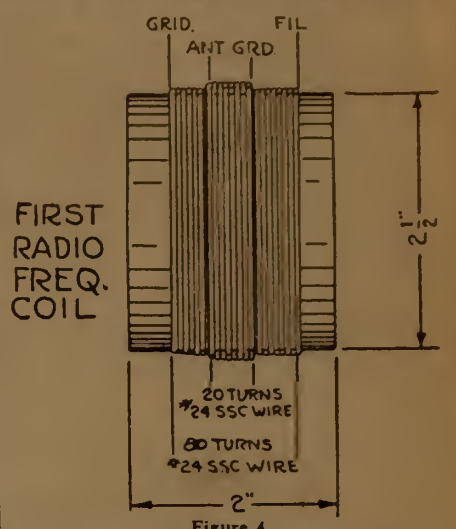

Figure 4

(Continued on page 26)

UV-201-A

Radiotron UV-201-A is a high-power vacuum tube which, while suitable for a detector, is intended primarily to be used as an amplifier, at either radio or audio frequency.

It is famous for volume, for clearness and for economy of service—drawing but .25 ampere.

Price **$5.00**

Radio Corporation of America

Sales Offices—Dept. 314
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10 South LaSalle St., Chicago, Ill.
433 California St. San Francisco, Cal.

This symbol of quality is your protection.

Be sure that every vacuum tube you buy is marked RADIOTRON.

Radiotrons

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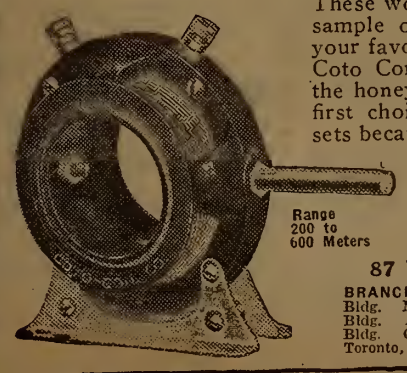
Coto

"Built First to Last"

"Very Much Better Than Your Advertising Claimed"



These words from a user's letter are just a sample of nation-wide favor. Wherever your favorite circuit calls for a variometer, Coto Compact Moulded Variometer with the honeycomb wound stator coils is your first choice. Also available for portable sets because of small size.

Range 200 to 600 Meters

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

COTO-COIL CO.

87 Willard Ave., Providence, R. I.

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

2-LO, LONDON, ENGLAND ON ONE TUBE

Another Record for the

ELGIN SUPER-REINARTZ

Tuesday, November 27, during the test period between 9 and 9:30 P. M., Rev. E. A. Cole in the residence of J. A. McIver, of Roodhouse, Ill., while operating a set made of materials and in accordance with the hookup furnished by the ELGIN RADIO SUPPLY CO., tuned in 2-LO, London, England, using receivers and but one tube. Later another tube was lighted and the loud speaker used, so that four people could hear the program and concluding announcement. The numbers, time, and the order in which they were played were

Officially Confirmed

by the St. Louis Post Dispatch in conjunction with the National Association of Broadcasters, who had charge of the tests. (See page 34, St. Louis Post Dispatch, Dec. 2, 1923.) This same hookup has been advertised extensively as the one which brings in stations 2000 miles overland on a loud speaker and one tube; and this has been demonstrated so often as to need no repetition.

Send a two-cent stamp for circular giving one, two, and three tube hookup, and price list of parts for this remarkable circuit. Address the

ELGIN RADIO SUPPLY CO.

207 Chicago St. ELGIN, ILL.

THIRTY MINUTE A-B-C

(Continued from page 19)

certain frequencies. A vernier condenser, Figure 54, is really two, one large and one tiny, so that the size of the frequency container of the condenser and coil combination may be more finely adjusted.

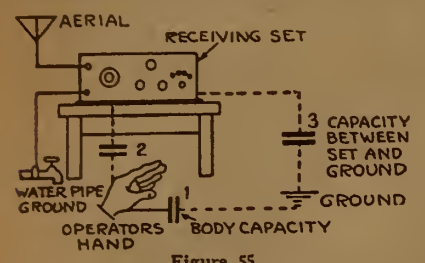


Figure 55.

Body capacity occurs when a small condenser is formed by the operator's hand or body and the receiving set. The human body when insulated from the earth makes a small condenser, number 1, Figure 55, with it. The hand insulated from the receiving set makes a tiny condenser, number 2, with it. The set and

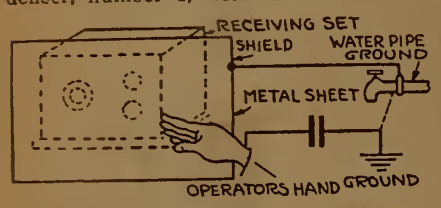


Figure 56.

its batteries will usually make a condenser, number 3, with the ground. This has an interfering effect in tuning some sets and can be avoided by grounding the movable plates of the condenser used

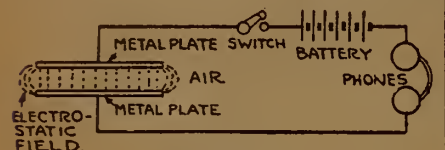


Figure 57.

in tuning the set or by employing a capacity shield. The principle of a capacity shield is shown in Figure 56, where a metal plate is connected to the ground and interposed between the operator's hand (usually back of the instrument panel) and the set.

Electrostatic Field

There is an electrostatic field set up between the plates of a condenser, as diagrammed in Figure 57. Tubes of force extend in the dielectric between the plates. In an aerial, such tubes of force extend between the aerial wire and ground, as indicated in Figure 58. A transmitting aerial sends off a pair of field components, one electromagnetic and the other electrostatic and at right angles thereto. A receiving set employing an aerial operates on both of these components, while one employing a loop, functions mainly on the electromagnetic part of the travelling field, known as Radio waves.

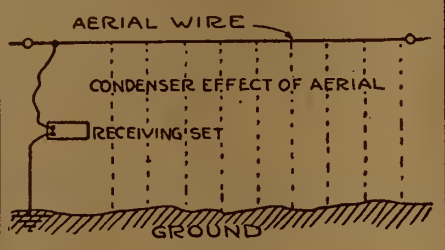


Figure 58.

The practical unit used to express the size of condensers or capacity in Radio is the microfarad. Sometimes condensers are spoken of by the number of plates, as 23-plate, 43-plate, etc., but this is less precise than to say .0005 microfarad, .001, etc. Many fixed condensers on the market at the present time are inaccurately labelled as to capacity. Good fixed condensers usually are made from mica, compactly compressed and insulated and marked with reasonable accuracy. Good variable condensers are well built mechanically, have carefully rounded plates, and must run true. If one plate touches another, the device is no longer a condenser but a conductor the same as any scrap piece of wire might be. Some manufacturers design condensers with a so called minimum "phase angle" loss, which simply means that the dielectric is arranged to be as perfect as possible.

The next thirty minutes in this series will take up resistances and what they do.

(TO BE CONTINUED)

How Telephones are Ruined

As much care should be exercised in handling your head phones as you exercise in handling your tubes. Phones are delicate. If you drop them or subject them to a hard jar you may put them out of adjustment. The same accidents will have a tendency to demagnetize the magnets. In fact, some phones lose their magnetism easily.

Dropping the phones is also apt to crack the ear piece. A cracked ear piece, while it may still be comfortable on the head, will not hold the diaphragm down tightly upon the seat. A crack will also relieve the air pressure and cause a shallow tone.

Most phones made by reputable manufacturers have one lead or terminal marked with a red or colored thread in the insulation. This terminal should be attached to the positive B binding post or jack contact. If both leads are colored, one being red, the red one is attached to B plus, the other to plate.

Review of Books

Within the Atom. By John Mills. May be read by the Radiophan with interest for it deals with that infinite particle as associated with electrons, and all chemical and all electrical phenomena. Price, $2.00.

Experimental Wireless Stations. By P. E. Edelman. Simple directions are given in this book for making Radio equipment for the transmission of messages over long distances. Price, $3.

The Radio Amateur's Handbook. By A. Frederick Collins. A new revised edition of this book is just out. It is complete, authentic and informative work on Radio. Fully illustrated. Price, $1.50.

Vacuum Tube Receivers. By O. F. Heslar. A book that tells how to make a simple set. How to make the cabinet. It includes a 27 by 36-inch layout blueprint, Price, 75 cents.

Radio Reception. By Harry J. Marx, Technical Editor Radio Digest Illustrated, and Adrian Van Muffling. A simple treatise on Radio reception. Beginning with the elementary principles of electricity it carries the reader on into the essentials of Radio telephony. The most successful methods of Radio reception are explained and special attention given to practical tuning. Price, $2.00.

The A B C Vacuum Tubes. By E. H. Lewis. It is a book for beginners who have no knowledge of either Radio or electricity and sets forth the elementary principles of theory and operation of the vacuum tube. No attempt has been made in this book to describe all the possible circuit arrangements, but those shown may serve as suggestions to experimenters who desire to evolve their own circuits. Price, $1.00.

The Armstrong Super-Regenerative Circuit. By George J. Eltz, Jr., E. E. This is a De Luxe edition of this famous circuit. Profusely illustrated and fully explained. Fifty-two pages. Price, $1.00.

Radio Operator's Handbook. A pocket course in Radio. Every page tells you something useful, and there are 154 pages; hundreds of illustrations and diagrams. It is the biggest dollar's worth in Radio, and will save you from wasting money on things that don't work. Price $1.

The book department of the Radio Digest is prepared to send you any of the books on Radio published whether listed in our Book Review or not. Let us know what book you want, send us your check and we will see that the book is mailed to you. Postage stamps in payment for books not accepted. Send money order or check. Radio Book Department, Radio Digest, 123 W. Madison St., Chicago, Ill.

Amplification

The higher the voltage placed on the plate of the last step of amplification used in connection with the loud speaker, the louder will be the signal up to a certain point. Amplifying tubes now on the market will stand about 150 volts without any trouble. This requires six or seven B batteries.

The Twitchell Auxiliary Tuner

Patents Pending. Name Registered.

MORE THAN A WAVE TRAP

A TWITCHELL AUXILIARY TUNER connected to any make of tube receiving set will positively cut out any local broadcasting or code stations so you may tune in all long distance stations any time regardless of local conditions.

Unlike any wave trap, THE TWITCHELL AUXILIARY TUNER does not ever decrease but in many cases increases the volume from distant stations.

These TUNERS are in daily use within 400 feet of large broadcasting stations and enable their owners to easily and completely cut out the local station and bring in distant stations at any time on a loud speaker.

This instrument will also enable you to bring in programs sent out on longer waves than you can tune in without it, thus bringing all the broadcasting stations within the wave length range of the many sets of limited range now in use.

Copyrighted diagram of this tuner, 50c, or with all parts, $9.00. Complete instrument in walnut cabinet, ready to use, $15.00.

A New and Wonderfully Efficient Coil for the Reinartz circuit for those who want **the best. Price $4.00,** or with blueprint for either one or three tubes, **$4.50.**

This circuit brings in both coasts loud and clear and is the most successful Reinartz modification yet produced.

All goods prepaid. These instruments are easy to build, easy to operate. Everything clearly shown

1925 WESTERN AVENUE **S. A. TWITCHELL** MINNEAPOLIS, MINN.

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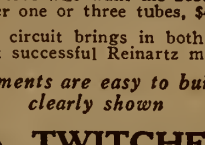
FREE — FREE

HYDROMETER AND 45 VOLT "B" Battery



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Special 200-hour Re-chargeable Storage Batteries

2 Volt for WD-11 and 12 Tubes	$ 5.00
4 Volt for UV-199 Tubes	8.00
6 Volt 60 Amp.	8.50
6 Volt 80 Amp.	10.00
6 Volt 100 Amp.	12.50
6 Volt 120 Amp.	14.50
6 Volt 140 Amp.	16.00

5% Discount for Cash with Order.

SEND NO MONEY

Just clip this ad and mail with your name and address. Shipment made same day order is received. When battery arrives, inspect it. Read our 2-year guarantee before paying C. O. D. express charges. Get the 45-volt "B" Battery and Hydrometer FREE. Clip the ad and send your order NOW.

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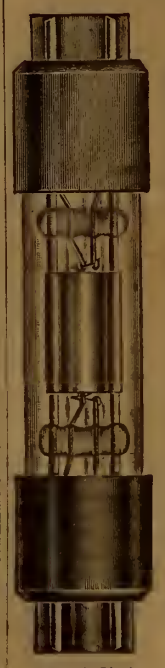
World Send Your Order Today



(Actual Size)

30 STATIONS In One Hour!

—heard with one Myers Tube (name and address furnished on request). The remarkable results being obtained with Myers Tubes are due, largely, to the elimination of socket with its bunched leads.

Myers Tubes

(practically unbreakable) give you distance with clarity. They add 50% to the efficiency of any set by reducing interference. See that you get the New Improved Myers Tubes. Others are not guaranteed. Insist on Myers at your dealers—otherwise send purchase price and be supplied postpaid.

Two types—Dry Battery and Universal (for storage battery). Write for free circuit diagrams.

$5 EACH Complete with clips ready to mount on your set; no sockets or other equipment necessary.

E. B. Myers Co. Ltd. Radio Vacuum Tubes
240 CRAIG ST. W.
Montreal, Canada

Kenneth Harkness Says:—

"Fil-Ko-Stats provide fine regulation essential if maximum efficiency is to be obtained and are particularly useful in tuning in weak stations. Fil-Ko-Stat gives such fine control of filament temperature that it has become almost indispensable."

The filament kontrol of infinite adjustment

FIL-KO-STAT

The Scientifically Correct Radio Rheostat

Is Standard Equipment of all

HARKNESS RADIO RECEIVERS

Write for booklet, "Improved Reception Through Scientific 'Tube Tuning'." To D. X. Instrument Co., Harrisburg, Pa., Dept. RD 419.

Unconditionally guaranteed to give satisfaction by the Makers. D. X. Instrument Co., Harrisburg, Pa.

RADIO STORES CORPORATION, NEW YORK

Sole International Distributors

Selection of Sets Having Desirable Hook-Up

Part II—Combinations That Control Regeneration

By Thomas W. Benson

HAVING considered in the previous article the most efficient methods of tuning we now come to the question of regeneration. It is this ability to regenerate that makes the tube subject to so many trick circuits because there are numerous combinations of methods that can be employed to cause and control regeneration. Since regeneration is obtained by feeding a portion of the energy in the plate circuit back into the grid circuit for re-amplification or to assist the original impulse affecting the grid it

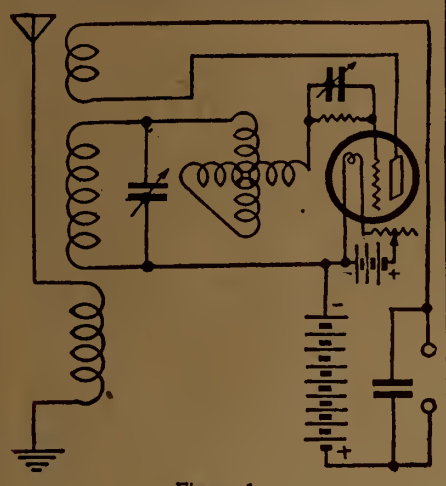


Figure 1.

is very obvious that the method giving the easiest and simplest method of control is to be preferred.

We will find on analyzing the trick circuits that they employ either capacity, inductive or conductive feedback, or a combination of these methods. But too often the regeneration control is so designed or arranged that the tuning of the set affects the regeneration. It would be an ideal arrangement were we able to retain perfect regeneration over the entire range of wavelengths without readjustment but this condition has not been obtained in practice. Under most conditions the method of feedback should give regeneration over as wide a band of wavelengths as possible.

Three Methods of Feedback

Of the three methods of feedback the inductive method employing a tickler gives as good results as any. A tuner employing tickler feedback is staple in operation and will be found to operate consistently at all times. Where somewhat greater selectivity is desired the tuned plate method of regeneration may be employed but this circuit is a little trickier in its operation than the tickler feedback. However, for all around reliable service stick to the tickler and the circuit will prove satisfactory.

Now we are ready to lay out the circuit as outlined in the preceding chapter and then to consider the final constructional details that will make it a real go-getter. In Figure 1 is a circuit that shows nothing really new and, in fact, it may be so old that it is forgotten, but it is second to none when it comes to bringing the stuff in all the time.

We find the aerial circuit is untuned and comprises 8 turns, a secondary of 30 turns and a tickler of 24 turns. A variometer is used to turn the grid circuit and a small variable condenser for vernier tuning on the secondary. The problem now is to build and mount this apparatus so it will get the greatest amount of energy into the tube and then use it to the best advantage. The circuit meets the requirements as far as the circuit goes, from here on its construction counts and unless a set is properly constructed with a view to eliminating every possible avoidable loss it will not work up to its maximum efficiency.

Reducing Resistance

The first thing to reduce to the lowest point in a receiving set is the resistance. It is generally accepted that the resistance of a circuit when oscillating is reduced and becomes negative, this is very true but if the circuit has a low resistance to begin with that negative resistance will become still greater and louder signals will be produced. To that end we will cut the resistance of the windings to the lowest point practical.

To do this we must use heavier wire, but there is a limit to this, else the coils will be unwieldly. Number 18 dcc. wire will be found the best to use for the secondary and tickler windings. For the primary we are permitted to use a somewhat heavier wire and number 12 or 14 will be employed. In addition it is not only the wire itself that offers resistance but the support on which that wire is wound will also increase its resistance. Strange as it may seem bakelite is not to be advised as core material in the form of a tube, as it has a high hysteresis loss. Other materials are preferable but the best insulator for high frequency inductances is air. Give your Radio apparatus plenty of air and it will work better. To this end we will make the tuner self supporting as far as possible.

The secondary coil is wound by setting 14 pegs in a 4-inch circle by drilling holes in a board and inserting stiff steel wires. Number 18 wire is then wound around these pegs as shown in Figure 2 to form a basket wound coil. When the 30 turns are in place, the coil is bound together with thread. The easiest method of doing this is to sew the turns of the coil together with heavy thread. The

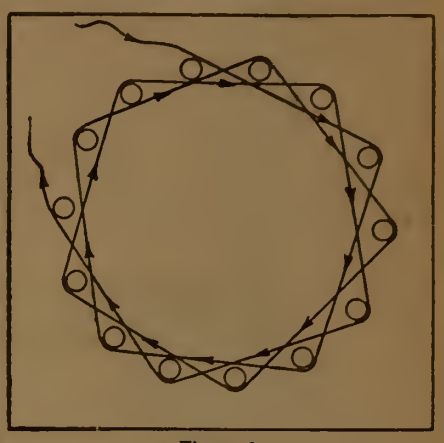


Figure 2.

wire is fairly stiff and will help hold the coil together.

The tickler coil is wound in the same

(Continued on page 24)

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This is not a "cheap" or "bargain" set. Only the finest quality instruments are used. Employs the reliable tuned radio frequency circuit with one step radio frequency, detector, and two steps of audio. Capable of coast to coast reception and use of any loud speaker to its full efficiency. Reproduces in loud, clear, melodious tone. Critical—selective. Recording position of controls for any station enables resetting at same position to bring station back. Quiet in operation, simple to tune. Furnished in beautiful Mahogany finished cabinet. Responsible dealers can show you this Air-Way. Ask to see it or write to us.

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7 POINTS OF BEL-CANTO SUPERIORITY

1. Our own Fiber horn. Crystalline finish.
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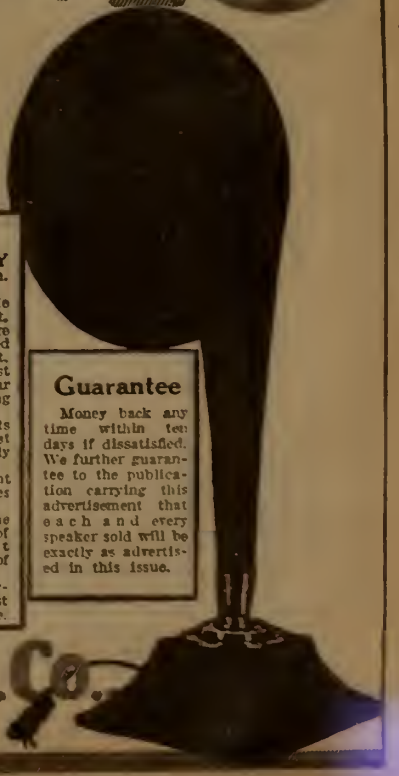

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DESIRABLE HOOK-UP

(Continued from page 23)

manner on pegs placed in a 2½-inch circle of the same size wire and sewed together before removal. The primary coil is wound on the same pegs as the secondary and can be held in shape with a few ties. This completes the windings for the tuning unit.

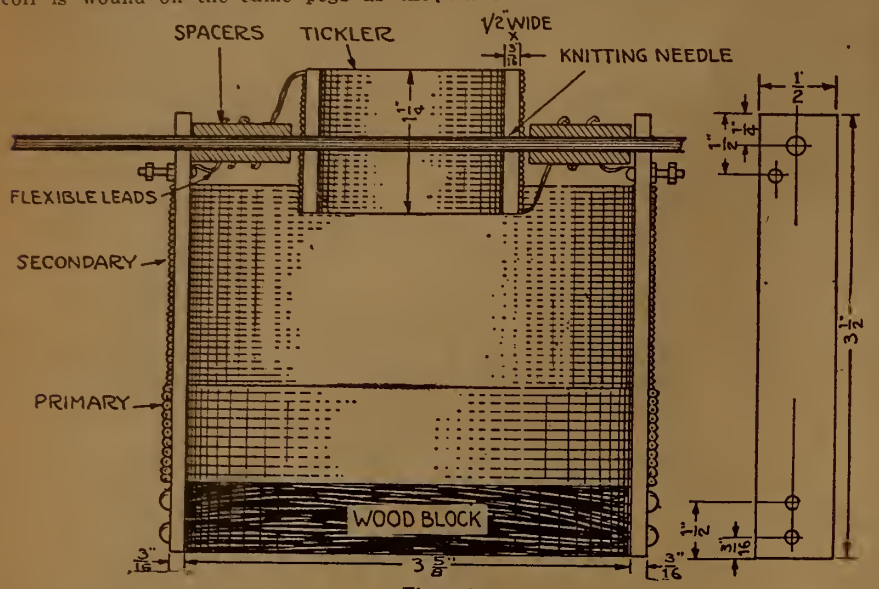


Figure 3

Tuner Construction

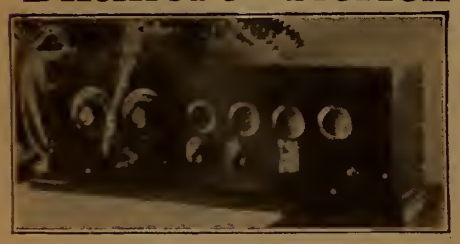
In Figure 3 is given the constructional data on the tuner. Two strips of bakelite are cut for uprights and securely screwed to a square wood stick to form two upright legs to which are bound the primary and secondary coils. The ends of the strips are drilled to mount a terminal bolt for the tickler and for a bone knitting needle to pass through. The long celluloid needles are excellent for the purpose. The rotor is made up by cutting two strips of bakelite ½-inch wide and 1⅛-inches long. Through the center of the strip is drilled a hole that will just pass the knitting needle. These strips are lashed inside the tickler coil at opposite sides and the wires covering the holes carefully spread. Two spacers for the tickler are made by drilling a hole through short lengths of dowel sticks to pass the needle. Solder flexible leads to the rotor before assembly.

The complete assembly of the tuner should be fairly obvious. The primary and secondary are placed right against each other. The knitting needle is pushed through the hole in the upright strip, then through a space into the rotor, then out on the other side, through another space and into the other bakelite upright. The flexible leads are wrapped around the shaft a few times and attached to the terminal screws in the uprights. The needle should fit the cross pieces in the rotor fairly tight and can be firmly attached with a good grade of glue. Do not cut any off the needle as you may need entire length.

You now have a tuning unit that looks about as rough an article as can be conceived, but do not try to paint it with shellac, for despite its looks it has none of the defects of the beautiful instruments you see advertised, no bearing troubles, low hysterisis losses, low distributed capacity or low direct current resistance. The next article will cover the other instruments in the set and show the method of mounting apparatus to obtain maximum range and volume.

(TO BE CONTINUED)

Biltmore Reflex



THREE THOUSAND miles on the loud speaker, without outdoor antenna, or loop. This is what the Biltmore Reflex is capable of. But a few feet of concealed wire and a ground connection are all that is required. Actually, the results are better than those obtained on the eight-tube super-heterodyne.

The quality of the tone is clear and pure, due to the Erla rectifier which is employed.

In appearance, the receiver is unsurpassed—a beautiful Radion Mahoganite panel, a heavy, hand-rubbed mahogany cabinet, nickelplated metal parts. All connections to the rear of the cabinet.

The most efficient reflex circuit is used—four tubes, but equivalent to eight.

The best of apparatus is employed—Radion Mahoganite panel, bakelite reflex variocoupler, moulded bakelite sockets and dials, Frost jacks, Acme Radio Frequency, and Acme Audio Frequency Transformers, Dubilier Micadons, Erla Rectifier. We can obtain no better apparatus.

It is extremely selective. Local stations may be tuned out at will. The tuning is very simple. A child can operate it with no practice. You have but to snap on the switch to listen to the world.

It is but slightly affected by static—ideal for summer reception.

It may be operated entirely on dry cells!

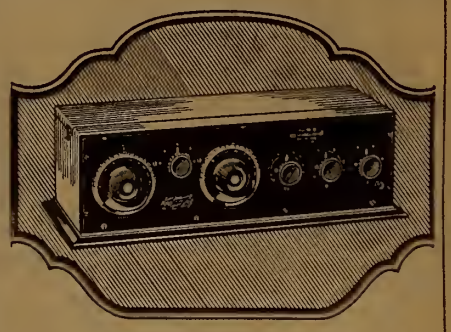
And, the price. $100! Anyone can afford this receiver. Should you operate it, and see it, and hear it, you would have no other.

And,—we assure you of, and guarantee you complete satisfaction.

DEALERS—YOU SHOULD CARRY THIS MOST POPULAR RECEIVER. WRITE US.

BILTMORE RADIO COMPANY
DEPT. D BOSTON 30, MASS.

COAST-TO-COAST RECEPTION —and Beyond—



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NO LOOPS - - NO AERIAL

WITH the RADIODYNE you can select broadcast programs from all parts of the country. Honolulu and London have often been picked up by operators in the central states without interference from nearby stations.

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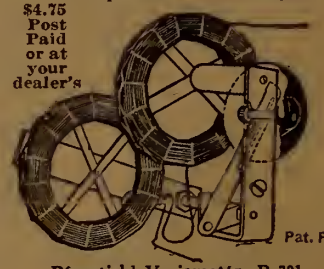

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☐ Regenerative
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Send Only $1.00 for this Long Distance RADIO

$5.00 W.D.-12 Vacuum Tube Absolutely FREE To First Order in Your County

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The regular price on this high-grade instrument is $50.00 but they must be sold at once.

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Thousands of users have proven what it will do.

Tonight I heard very plainly stations WAAJ, Boston, Mass., and WLD, and have no trouble in tuning in WOC at most any time. Have also heard Denver, Colo. I am more than pleased with the set. R. T., Shawnee, Okla.

I have heard Drake Hotel, Chicago; Cleveland; WGY, Schenectady, N. Y., real good; Newark, N. J.; Pittsburgh; Astor Hotel, N. Y.; Springfield, Mass., and others. P. S., South Royalton, Vermont.

I have tuned in many stations. I have received Chicago, Minneapolis, Los Angeles. Two evenings I have tuned in Havana, Cuba, from Cyril. L. D., Selby, South Dakota.

The first station I was in on was at Atlanta, Ga., and today my wife heard a concert from Beverly Hills, Oakland, Cal. I wish to say we are perfectly satisfied and delighted with the instrument. L. G., Peru, Ill.

I am getting good service from the set. I regularly hear Denver, Colo.; Detroit News; Detroit Free Press; Kansas City Star; Davenport, Iowa; Ft. Worth, Texas, and have had Schenectady, N. Y., and Los Angeles, Cal., a few times. F. T., Memphis, Tenn.

To date I have picked up 26 different stations, ranging from Chicago to Los Angeles, perfectly clear. M. C., Silverton, Texas.

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You can enjoy all the concerts on this instrument just as well as on the highest priced instruments on the market. All you need in addition to the receiver is a 22½ volt "B" battery, $1.75, a set of head phones, $5.00 a dry cell, 45c, and some aerial wire. You can purchase these at any radio store. Remember, this is not a toy, but a real long distance receiver. Don't write for literature—Order right from this advertisement. The price of this receiver is only $20.00. All you need send me is $1.00—the instrument with the FREE tube will be sent by parcel post. When it arrives pay your postman $19.00 plus a few cents postage. Don't forget, with the first order from your county you get a genuine Radio Corporation

$5.00 W.D.-12 TUBE FREE

Our Financial Responsibility—Mid-City Trust and Savings Bank, Chicago. R. G. Dun and Bradstreet.

I reserve the right to withdraw this Special Offer at any time, so don't delay. H. A. Fischer, Secy., 226 W. Madison St., Chicago.

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H. A. FISCHER,
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Name .....

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Be sure to give name of your County.

What's Wrong with Your Receiving Set?

(Continued from page 13)

	199	200	201A
Between grid and plate	4.0	6.0	7.5

The successful elimination of the bothersome capacity effect within the tubes led indirectly to other improvements in the construction and manipulation of the inter-stage Radio frequency transformers. These so-called neutroformers are made with a step-up ratio in the windings, in that there are four times as many turns of wire on the secondary as on the primary. Consequently, the induced secondary potential is increased four times, due to this step-up ratio, resulting in further amplification.

Construction of Coils

The construction of the neutroformer coils is such that their distributed capacity and inductance, mutual inductance, coefficient of coupling, and the mechanical disposition of the primary and secondary windings are quite important. The secondary of the neutroformer is wound on a tube outside the primary coil, so as to act as a sort of a screen for some of the coupling capacity effects which usually are present between the transformer primary winding of one stage and the secondary circuit of the preceding stage. Furthermore, the neutroformers should be mounted approximately at an angle of 60 degrees from the horizontal and at least 6 inches from each other. This precautionary measure is very important to bear in mind, so that the transformers will not be in the electromagnetic fields of each other and cause objectionable reaction.

Tuning the neutroformers into resonance with the incoming wave is accomplished by the careful adjustment of variable condensers connected directly across the secondary coils. The regular Radio frequency transformer cannot be employed for this purpose, because the special transformer has a step-up ratio and is provided with a tap in the secondary winding for a neutrodon connection. This tap and consequent connection, are of special importance in connection with the correct operation of this type of receiver. As constructed commercially, the neutroformer coils are mounted upon standard variable condensers, which function as noted above. Efficient coupling between stages is effected by mounting the coils extremely close together. This condition makes it unnecessary to provide bypass fixed condensers in the amplifier grid circuit.

Hook-Up For a Neutrodyne Receiver

Before finally deciding which type of neutrodyne circuit receiver to construct, it will be advisable to consider in some degree the capabilities and the limitations of some of these receivers, so that a ready comparison may be made. There have been selected for this purpose only those types which through general usage have been sustained by popularity. Obviously, the variety of hook-ups that can be devised, using the neutrodyne principle as a basic, are legion, and the several standard types presented herewith will permit the Radiophan to select the number of stages of amplification as desired.

Perhaps the simplest of the neutrodyne circuit receivers is that shown diagrammatically in Figure 1. This three-tube receiver consists of two stages of tuned Radio frequency amplification and a detector. Special Radio frequency transformers, or neutroformers, are used for interstage coupling, and neutrodons are provided for neutralizing the tube capacity effects. It will be noted that the neutroformer secondary windings are constructed with one special tap each. No connection is to be made to this tap on the neutroformer which is employed as the tuner. The connections from the taps on the interstage coupling neutroformers should lead directly to one terminal of the corresponding neutrodons, as shown in the diagram. Three terminals are provided on the neutralizing condensers, affording three different ranges of capacities combined in one condenser by changing the connections to the three terminals. Ordinarily, connections are made to the two terminals at the ends, but under some circumstances, this arrangement does not give a good minimum signal balance. In such a case, it is advisable to join one of the neutroformer connections to the center terminal. Such a connection will give a greater capacity range to the neutrodon and generally a good minimum or inaudible signal adjustment may be secured.

Four-Tube Reflex Neutrodyne

Figure 2 gives the hook-up diagram for a four-tube reflex neutrodyne receiver, consisting of two stages of tuned Radio frequency amplification, detector and two stages of audio frequency amplification. The first stage of the latter is reflexed back into the first Radio frequency amplifying tube. Although it is advisable to employ five tubes in order to get sufficient distance and signal strength, the use of four tubes reflexed in the manner shown, while not increasing the overall efficiency of the circuit, will effect quite a material economy in tubes and consequently current consumption.

The precaution should be taken to see that the audio frequency amplifying transformers are not located so as to lie in the electromagnetic field of the neutroformers, because under such conditions the interaction may cause distortion and howling. This is especially important in reference to the reflexed stage.

(TO BE CONTINUED.)

How to Get Clear Signals

Use a good panel. Avoid varnished coils. Solder all connections. Keep coils away from masses of metal materials.

Use good tube sockets (especially on the first tube.) Use coils which are insulated by air as much as possible.

Where rotating secondaries are used, use pig-tailed connections to the rotor windings.

Keep the grid lead away from the plate wire or the filament wires, particularly on the first tube.

Avoid taps to a coil if possible, but where essential so select the constants that the taps will be only on a few turns at one end.

Keep stray capacity down by locating the connecting leads to the inductances, condensers, etc., as far away from each other as possible.

The "Goode" Two-o-One

A

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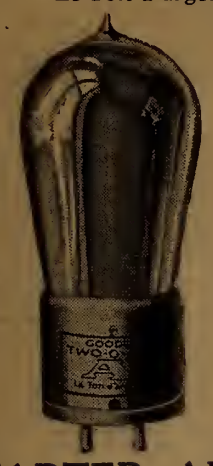

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EQUAL to the widest range of reception requirements. Marle Transformers amplify the weakest broadcasting, over frequencies all the way up to 3500 cycles without variation. Perfect tone quality. Utter absence of howling or distortion. To get the most out of radio—use Marle Transformers.

Specially adapted to the latest circuits, the SUPERDYNE, SUPERHETERODYNE, FOUR-CIRCUIT TUNER, NEUTRODYNE, INVERSE DUPLEX and any circuit that makes high requirements of a transformer.

Type A 9 Shell Type Ratio 5 to 1 Audio F.	Type A 6 Ratio 5 to 1 Audio F.	Type A 4 3¾ to 1 Ratio Audio F.
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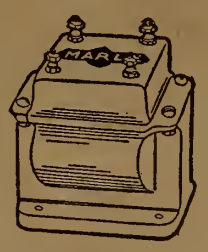

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WALNART TUBE SOCKETS

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Electrically Right
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(Non-breakable)
Perfectly Insulated Thruout
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Continental White Horn Fibre—the positive dielectric insulation is used in these sockets

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532 S. CANAL STREET CHICAGO

COMPACT RECEIVING SET

(Continued from page 21)

the condensers. It will be noticed that the first coil is mounted with the core in a horizontal position whereas the second coil has the core in a vertical position. The mountings shown in Figures 4 and 5

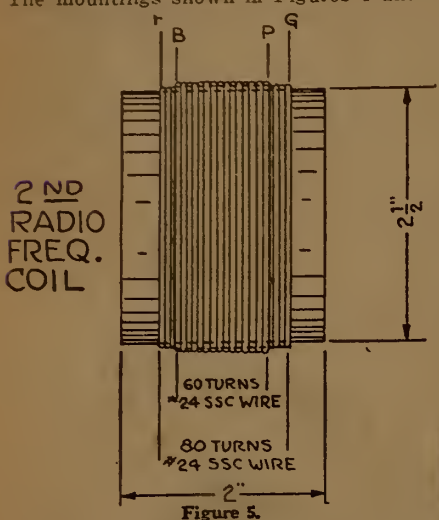

Figure 5.

conform to the markings shown in Figure 1.

Tuning

In tuning this receiver it will be found that the settings of the two condenser dials will be fairly close to one another inasmuch as both secondaries have the same number of turns and are only slightly affected by the inductively coupled primaries. Neither one of the two rheostats has a critical setting. On tuning in, both condenser should be turned together until the approximate relative ratio is determined. The B battery voltage should not be increased inasmuch as little or no gain of volume is anticipated. It can be decreased as desired since often tubes used for Radio frequency amplification require definite potentials in the plate circuit for best results.

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Short circuits in cheap variable condensers can often be remedied by experimenting with the tightness of the various nuts that hold the stationary plates together.

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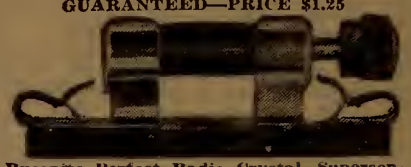

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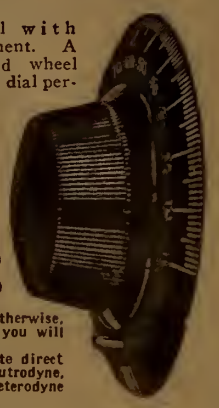

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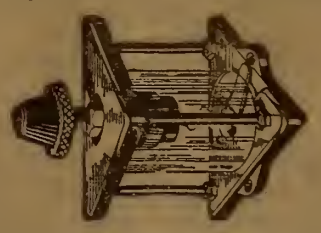

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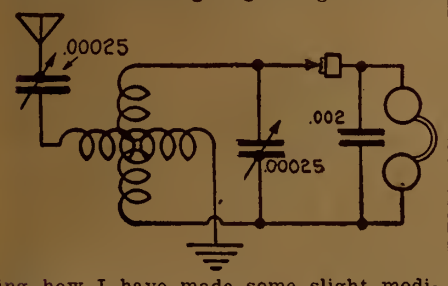
Variations on King Miloplex Circuit

Three Wires Placed in Cellar Used for Aerial

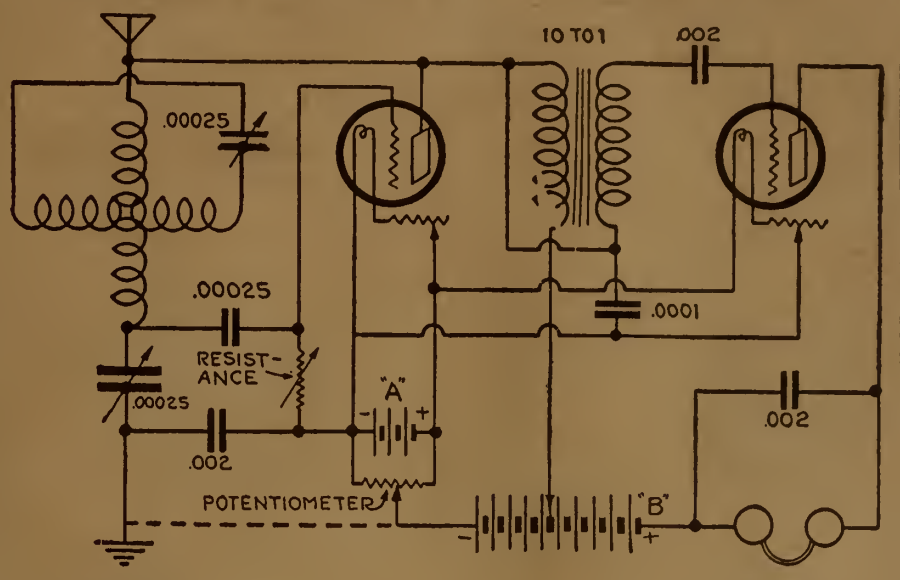
HAVE taken great interest in the various Miloplex hook-ups which you have published since last September, and having tried out all of them, I must say they are wonderful. I have also tried modifications of them with more or less success. The King, however, is my favorite and I am giving a diagram showing how I have made some slight modifications which I believe will be of interest. These modifications are as follows: Both variable condensers are 11 plate of about .00025 mfd capacity, preferably with verniers.



A connection is made on the transformer from A— post to P post. A fixed condenser is placed in the lead from A— on the transformer to the A battery. The capacities of these condensers are indicated as I am using them, but other capacities may be found to give even better results. The plate voltages should be determined by trial.

I am using a 3-wire cellar antenna, about 45 feet long, spaced about 4 feet apart with the far ends connected by a cross wire. The lead-in to the set is about 5 feet and the ground, about 8 feet long, is connected to a water pipe where it leaves the house.

VALUES OF CONDENSERS USED



With one stage of amplification I have tuned in most of the large broadcasting stations within a radius of 1,000 miles very distinctly. I use UV-199 or C-299 tubes. About 22½-volts on the detector and 45 volts on the amplifier plate. The potentiometer is of 1850 ohms resistance. I will say no more about the volume, it is deafening.

Another diagram is given for a crystal hook-up using a split variometer in a similar manner to the King Miloplex hook-up and I suggest naming it the Prince Miloplex is honor of the Mystery Man.

(Continued on page 28)

To Eliminate Howling in Amplifier Circuit

If adjusting the filament of an amplifier does not stop howling, try attaching a wire from the negative terminal of the battery used for lighting the filament of the tubes to the ground post of the set Should howling continue, try grounding the iron cores of the amplifying transformers by attaching a wire to the cores and bringing it to the ground terminal.

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.

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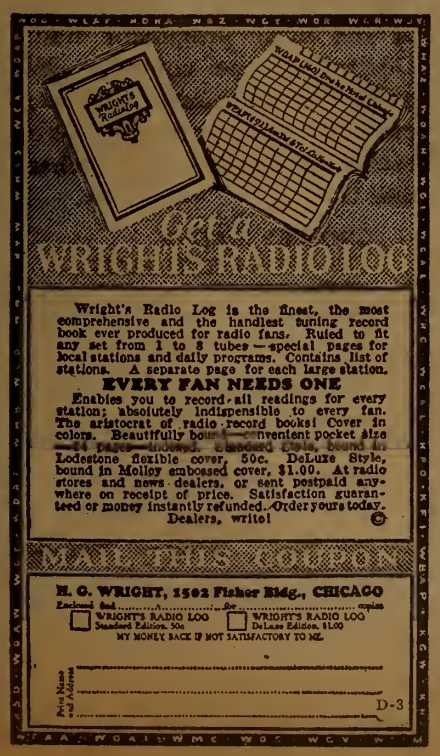

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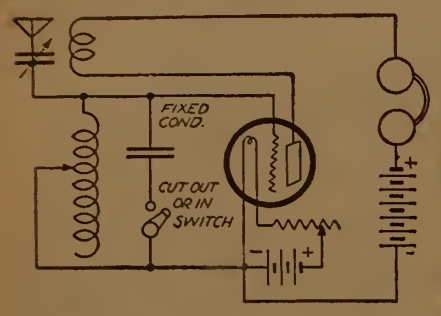
MILOPLEX VARIATIONS

(Continued from page 27)

I have tried out dozens of crystal hook-ups and find this to be one of the best. It has great volume and selectivity. I have my set wired so that I can use the crystal hook-up while my batterles are being charged. The results are practically as good by using the electric light socket with plug for antenna and the radiator for the ground.—James Young, 114 Euclid Ave., Haddonfield, N. J.

Increasing Wave Length

A quick, neat way of increasing the wave length of receiving sets is to place



a small fixed condenser across the secondary circuit. As a rule a variable condenser is used, but the fixed condenser will bring the wave length up just as well, and by aid of a small switch can be cut in or out at will.

For a set that will tune up through 400 meters a .00025 or regular grid condenser will bring in the 517-meter stations. If one condenser does not bring in all the higher stations, try connecting two condensers in parallel. If one condenser brings in the higher stations but cuts out some of the lower stations try two condensers connected in series.

It only takes a few minutes to put one of these condensers in place and it will not alter the appearance of any well-made set, nor does it call for any unusual ability to install.—C. L. Smith, Jackson, Miss.

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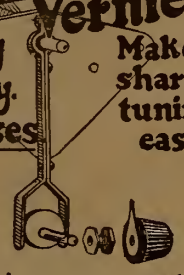

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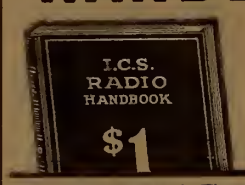

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4.25	Special Bank Wound Coupler for Haynes Circuit (with diagram)	3.25
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$3.50	Workrite	$2.95
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$2.00	R. C. 11 plate	$1.05
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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGESS OF AUGUST 24, 1912,

Of Radio Digest, Illustrated, published weekly at Chicago, Illinois, for April 1st, 1924.

State of Illinois, County of Cook, SS.—Before me, notary public in and for the State and county aforesaid, personally appeared E. C. Rayner, who, having been duly sworn according to law, deposes and says that he is the Publisher of the Radio Digest, Illustrated, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, E. C. Rayner, 745 Junior Terrace, Chicago, Ill.; Editor, Chas. F. Smlsor, 4757 Lake Park Avenue, Chicago, Ill.; Managing Editor, Evans E. Plummer, 4338 Clarendon Avenue, Chicago, Ill.; Business Manager, Harry J. Marx, 903 Lawrence Avenue, Chicago, Ill.

2. That the owner is: (If the publication is owned by an individual his name and address, or if owned by more than one individual the name and address of each, should be given below; if the publication is owned by a corporation the name of the corporation and the names and addresses of the stockholders owning or holding one per cent or more of the total amount of stock should be given.) E. C. Rayner, 745 Junior Terrace, Chicago; S. O. Bronstein, 4600 Lincoln Ave., Chicago; F. T. Ryan, 123 West Madison St., Chicago; A. R. Whits, 7015 Ellwood Ave., Chicago; Jos. Seaman, 200 Fifth Ave., New York City; Geo. Seaman, 2350 Parkway, West Chicago; D. R. Seaman, 49 Cedar Ave., Chicago; Chas. S. Peterson, 1450 Lake Shore Drive, Chicago.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of the total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

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5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is.....
(This information is required from daily publications only.)

E. C. RAYNER, Publisher.

Sworn to and subscribed before me this 31st day of March, 1924.
(SEAL) SUSAN KNOTT.
(My commission expires March 31, 1926.)

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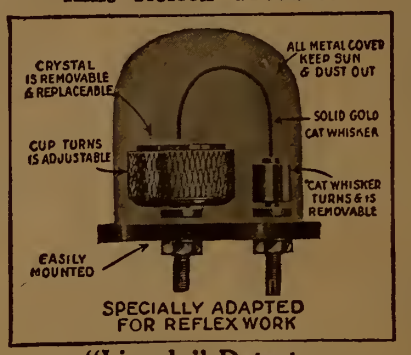

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OPERATING AND TROUBLE SHOOTING

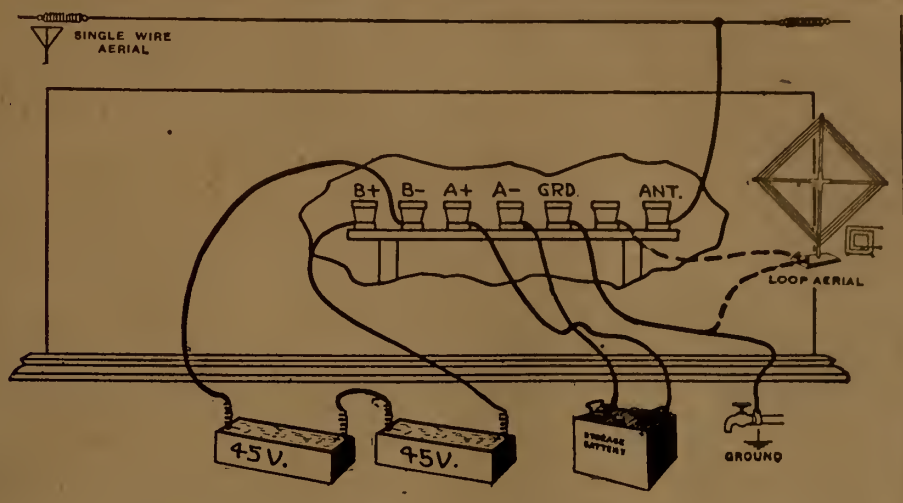
(Continued from page 11)

B+ and B— binding posts should be carefully made by well insulated flexible cord. If these joints are not clean and tight, clicking or scratching noises will be heard. When the tubes are lighted, a loud click is heard when the phone plug is inserted in either jack. If the click is weak or absent, the B batteries are reversed, dead or short-circuited, or the phones are burned-out or phone connections open. Be sure not to connect the B battery across the A battery binding posts. Burned-out tubes are the penalty for this error.

Tuning Instructions

Before attempting to operate the receiver it is wise to carefully check over the installation, beginning with the antenna and ground and seeing that the connections are secure and clean. See that the A and B batteries are new or fully charged and that the wires to them are properly fastened according to the wiring diagrams.

Plug phones or loud speaker into jack marked "Audio Amp."; turn filament rheostats dial Numbers 6, 7 and 8 until a slight ringing sound as of a bell is heard when the tubes are gently tapped with the finger; set dial Numbers 4 and 5 in accordance with Table II. Note: The two left-hand tubes are the Radio frequency amplifiers and are controlled by rheostat dial Number 6. The tubes must be of the same type. Set Numbers 2 and 3 as indicated in Table III for any particular wave length. For example: Suppose one uses UV-201A tubes for Radio frequency amplifier and detector and wishes to receive 360 meters. Dials 2 and 3 should be set at 40 degrees. Tune with Number 1 until the desired signal is received as shown in Table I. Readjust 2 and 3. If signal is too loud, turn rheostat 6 back a little while finding best settings of 2 and 3. If, on increasing dial 6, a local oscillation appears (evidenced by a whistle and mushy tone) readjust 1 and 2 a few degrees in either direction. Readjust 7 and 8 dials for best tone and volume. Don't burn tubes brighter than necessary for good reception in order to conserve their life. If headphones only are being used, turn off 8 and plug into jack marked "Det."



Distant Stations

In the initial reception of stations over 100 miles distant, it may be of advantage to upset the adjustment of dial 5 by rotating it clockwise to permit a local oscillation to start. This facilitates picking up the carrier wave of the distant station, and may be recognized as a clear whistle whose pitch may be rapidly changed by slight movements of 2 and 3. After dials 1, 2 and 3 have been adjusted to make the whistle as loud as possible, turn dial 5 slowly back until the whistle disappears and the true tone of the station is heard.

Setting for dial 1 for small indoor antenna are given only as a guide. After adjusting dials 2 and 3 in accordance with Table III, vary 1 slowly 10 to 15 degrees either way from the following figures until the station is heard.

TABLE I

Wave Length in Meters	Dial 1
183 meters	1½
200 meters	6
250 meters	19
300 meters	29
360 meters	40
400 meters	50
450 meters	60
500 meters	74
550 meters	88
600 meters	100

Larger antennas require less degrees on dial 1 for a given wave length while very short antenna require a greater dial reading.

TABLE II

Settings for dials 4 and 5 according to type of tube used.

Type of tubes in two left-hand sockets	Dials 4 and 5
Type UV-201	10
Type UV-201A	22
Type VT-1	25
Type VT-2	22
Type C-301A	22

TABLE III

Settings for dials 2 and 3 with UV-201A or C-201A tubes as Radio frequency amplifiers and detector. (Sockets 1 and 2 at left and extreme right hand.)

Wave length in meters	Dials 2 and 3
183 meters	1½
200 meters	6
250 meters	19
300 meters	29
360 meters	40
400 meters	50
450 meters	60
500 meters	74
550 meters	88
600 meters	100

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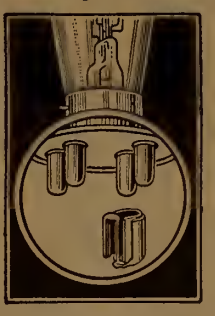

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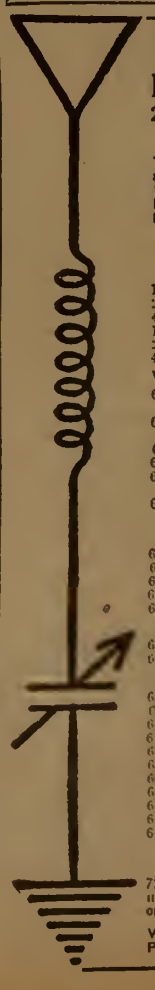

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Questions and Answers

Condenser

(07185) JS, Wetaskiwin, Canada.

I would like to know the make of the variable condenser illustrated in Figure 2, page 19, of the January 12th issue of the Digest, in the article by H. J. Marx; also where can I get one? There is probably some store in Chicago that sells them; if so, will you have them forward a catalogue?

A.—In reference to Figure 2, page 19 of the January 12 issue of Radio Digest, a Cardwell variable condenser is indicated. This unit is available through the Cardwell Condenser Company, Brooklyn.

Miloplex or Reinartz?

(05914) E. H. M., Lakeville, Ind.

I wish to assemble a Radio set. Which set would give me the better service—the Miloplex described on page 4 of your November 10 issue, or the Reinartz on page 14? Can I use dry cells with the Reinartz?

Would it give me better service to purchase a Crosley Model X? Can dry cells be used with the latter?

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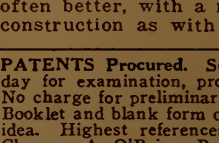

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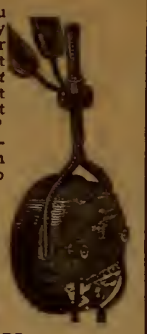

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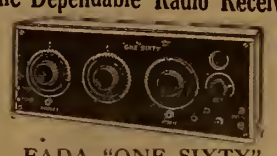

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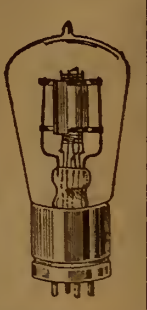

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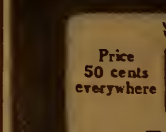
P. O. Box 22-A
Clinton Hill Station NEWARK, N. J.



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Radiophone Broadcasting Stations

Corrected Every Week—Part III

CHALLENGE SUPPORTS LIST'S CORRECTNESS

ONE DOLLAR will be paid to the Radiophan reader of Radio Digest submitting the most errors in any one station's listing in the Directory of Radiophone Stations, which appears in four parts, serially continuously, on page 31. Letters must reach Radio Digest's office not later than one week from date of issue corrected. Readers are not limited to correcting one station, but such corrections must be verified by the stations themselves, and NOT by comparison to other so-called accurate broadcasting directories or lists. Turn in corrections for as many stations as you can find—if you can find errors! Use separate sheet of paper for each station submitted and place name and address on each sheet. In case of tie, duplicate awards will be made.

[NOTE.—The third part of the schedule list appears below. The fourth part consists of the remsinder of the list and the complete state, city-station index and will appear next week.]

WEAJ, Vermillion, S. D. 283 meters. 200 watts. Univ. of S. D. Mon, 8:30 pm, music, college activities. Central.

WEAM, North Plainfield, N. J. 286 meters. 100 watts. Borough of N. Plainfield. Mon, 8-10:30 pm, concert, talks. Eastern.

WEAN, Providence, R. I. 273 meters. 100 watts. Shepard Co. Daily ex Sun, 12-1 pm, 4-5, music, reports, weather, concert. Mon, Wed, 6-7 pm, Mon, Tues, Wed, Fri, 8-10, concert. Sat, 9-11 pm, dance music. Sun, 10:45-11:30 am, 7:30-8:45 pm, church service. Eastern.

WEAO, Columbus, O. 360 meters. 500 watts. Ohio State Univ. Daily ex Sun, 1:30 pm. Wed, Fri, 4 pm, lectures, music. Thurs, 8-10 pm, lecture, concert. Eastern.

WEAP, Mobile, Ala. 360 meters. 150 watts. Mobile Radio Co. Daily ex Sun, 4-5 pm, music. Daily ex Sun, Mon, 7:45-8:45 pm, music. Sun, 3:30 pm. First Mon each month, 11-12 midnight. Central.

WEAR, Baltimore, Md. 360 meters. 50 watts. Baltimore American and News Publishing Co. Tues, Thurs, Fri, 7-10 pm, music, weather, sports. Eastern.

WEAU, Sioux City, Ia. 360 meters. 100 watts. Davidson Bros. Co. Slogan, "The Heart of the Corn Belt." Daily ex Sun, 10 am, 11, 12:30-1 pm, 2, 5, 6-7. Mon, Wed, Fri, 8-9 pm, concert. Sun, 7-9 pm, church services. Central.

WEAY, Houston, Tex. 360 meters. 1000 watts. Iris Theatre (Will Horwitz, Jr.). Slogan, "Where All the Oceans Meet All the Railroads." Daily ex Sun, 11 am, weather, news; 12 m, music; 12:57-1 pm, time; 2:30 pm, music; 6 pm, news, sports. Fri, 8-9 pm, band. Sat, 8-10 pm, concert. Sun, 11 am, 8 pm, church services; 9 pm, concert. Central.

WEB, St. Louis, Mo. 273 meters. 500 watts. The Benwood Co., Inc. Tues, 9-10:30 pm. Wed, 8-9:30 pm. Sat, 7:30-9 pm, 11 pm-1 am. Central.

WEV, Houston, Tex. 360 meters. 100 watts. Hurlburt-Still Elec. Co. Daily ex Sun, 10 am, 5:30 pm, weather, roads. Tues, Thur, 8 pm, concert. Central.

WEW, St. Louis, Mo. 261 meters. 100 watts. St. Louis Univ. Daily ex Sun, 9 am, 10, 2, 5 pm, reports. Central.

WFAA, Dallas, Tex. 476 meters. 500 watts. Dallas News and Dallas Journal. Slogan, "Working For All Alike." Daily, 10:30 am, reports; 12:30-1 pm, address; 2:30-3:30, reports, news; 5:30, bedtime story; 6:45-7, sports, news; 8:30-9:30, concert, weather (silent Wed). Tues, Sat, 11-12 pm, music. Sun, 6-7 pm, Bible class; 9:30-11 pm, music. Central.

WFAB, Syracuse, N. Y. 234 meters. 100 watts. C. F. Woese. Sun, 9:30-10 pm, Service; 10-11, concert. Eastern.

WFAF, Poughkeepsie, N. Y. 273 meters. 20 watts. H. C. Spratly Radio Co. Temporarily discontinued.

WFAH, Port Arthur, Tex. 236 meters. 150 watts. Elec. Supply Co. Mon, Wed, Sat, 9-10 pm. Central.

WFAJ, Asheville, N. C. 360 meters. 50 watts. Hi-Grade Wireless Instrument Co. Sun, 7:30-8:30 pm, church services. Eastern.

WFAM, St. Cloud, Minn. 360 meters. 20 watts. St. Cloud Daily Times. Daily ex Sun, 3:30-4 pm, markets, Mon, Wed, 7:30-9 pm, entertainment. Central.

WFAN, Hutchinson, Minn. 360 meters. 100 watts. Hutchinson Elec. Service Co. Slogan, "Gateway to The Ten Thousand Lakes of Minn., located in the Heart of the Great Butter Belt." Daily, 11:55 am-12:30 pm, program, news, time, weather. Tues, 8-10 pm, program. Special hours. Central.

WFAQ, Cameron, Mo. 360 meters. 10 watts. Missouri Wesleyan College.

WFAT, Sioux Falls, S. D. 258 meters. 50 watts. New Columbus College. Wed, Sun, 8-9 pm.

WFAV, Lincoln, Neb. 275 meters. 500 watts. Univ. of Nebr. Slogan, "The Home of the Cornhuskers. Daily ex Sun, 10 am, 12:40 pm, weather, news, road reports, Wed, 3:30 pm, concert.

WFI, Philadelphia, Pa. 395 meters. 500 watts. Strawbridge & Clothier. Daily ex Sun, 10:15 am, reports; 1 pm, orchestra; 1:50, reports; 3-4:30, concert; 6-6:30, children's hour; 6:30-7, orchestra. Tues, Thurs, Sat, 8 pm, concert. Tues, Sat, 10:10 pm, dance orchestra. Sun, 10:30 am, 7:30 pm, church services; 4:30, chapel service. Eastern.

WGAL, Lancaster, Pa. 248 meters. 10 watts. Lancaster Elec. Supply & Construction Co. Slogan, "Garden Spot of U. S. A." Mon, Wed, Fri, 7:30-9 pm, concert, lecture. Sun, 3-3:30 pm, church service. Eastern.

WGAN, Pensacola, Fla. 360 meters. 50 watts. Cecil E. Lloyd.

WGAQ, Shreveport, La. 252 meters. 150 watts. Glenwood Radio Corp. Daily ex Sun, 12-30-1:30 pm, 6:30, 7:30, music. Sun, 11 am, 7:30 pm, church service. Central.

WGAW, Altoona, Pa. 261 meters. 100 watts. Ernest C. Alhright. Slogan, "The home of the world's largest railroad shops." Wed, 9 pm. Sun, 10:45 am; 7:30 pm. Eastern.

WGAZ, South Bend, Ind. 360 meters. 500 watts. South Bend Tribune. Daily ex Sun, music. Mon, Wed, Fri, 7-8:30 pm, concert. Central.

WGI, Medford Hillside, Mass. 360 meters. 500 watts. Am. Radio & Research Corp. Slogan, "Amrad, the Voice of the Air." Daily ex Sat, Sun, 12 m-1 pm, concert. Tues, Thurs, 7-8:30 concert. Wed, Fri, Sat. 7:30-9:00, concert. Daily ex Sun, Mon, 6:30 pm, Big Brothers Club. Tues, Fri, 3 pm, Amrad Women's Club. Sun, 4-5 pm, 8:30, church services; 10, concert. Eastern.

WGL, Philadelphia, Pa. 360 meters. 500 watts. Thos. F. J. Howlett. Irregular schedule.

WGN, Chicago, Ill. 370 meters. 1000 watts. Chicago Tribune and Chicago Radio Lab. Daily ex Sun, 7-8 pm, 9-11. Sun, 6-9 pm. Central.

WGR, Buffalo, N. Y. 319 meters. 750 watts. Federal Tel. & Teg. Co. Slogan, "Key City of Industry." Daily, 10:45 am, weather; 12 m, reports; 12:30, organ music. Daily ex Sat, Sun, 12:30 pm, 4. Daily ex Sun, 2:30-4 pm, orchestra. Daily ex Sun, 6:30 music; 7:30, news. Mon, Wed, Fri, 9-11 pm, concert; 11-1 am, orchestra. Fri, 8:45, road reports. Sun, 3 pm, vesper services; 4, organ. Eastern.

WGV, New Orleans, La. 242 meters. 100 watts. Interstate Elec. Co. Slogan, "The Gateway to the World'a Richest Valley." Tues, Fri, 9:30-12:30 am, dance music. Central.

WGY, Schenectady, N. Y. 380 meters. 1000 watts. General Elec. Co. Daily ex Sun, 12:30-1 pm, 6, reports, time, sports. Mon, Tues, Thur, Fri, 2-2:30 pm, 7:45, concert. Fri, 10:30 pm, special. Sun, 10:30 am, 7:30 pm, church service; 3:30 pm, Symphony Orchestra. Eastern.

WHA, Madison, Wis. 360 meters. 1,000 watts. Univ. of Wis. Mon, Wed, Fri, 7:30 pm, lectures, news, agriograms. Central.

WHAA, Iowa City, Ia. 484 meters. 500 watts. Univ. of Iowa. Tues, 8-9:30 pm. Sun, 9-9:30 pm; 4 pm, once each month. Occasionally Thurs, 8-9:30 pm; Sat, 7:30-9 pm. Central.

WHAD, Galveston, Tex. 360 meters. 200 watts. Clark W. Thompson Co. Slogan, "The Gateway to the Southwest and Treasure Island of America. Discontinued temporarily.

WHAD, Milwaukee, Wis. 280 meters. 100 watts. Marquette Univ. Wed, 7:30-8:30 pm, music, antartainment. Central.

WHAG, Cincinnati, O. 222 meters. 100 watts. Univ. of Cincinnati. No definite schedule.

WHAH, Joplin, Mo. 283 meters. 250 watts. Hafer Supply Co. Tues, Thurs, 9-11 pm; Sat, 10:30-11:30; Sun, 9-11 pm. Central.

WHAK, Clarksburg, W. Va. 258 meters. 15 watts. Roberts Hdwe. Co. No definite schedule.

WHAM, Rochester, N. Y. 283 meters. 100 watts. Univ. of Rochester. Rochester Times-Union, Democrat and Chronicle. Daily ex Sun, 3 pm, 4:15, 6:50, 7-7:30, 7:35-8:30. Sat. 10:45-12:30 am, dance music. Sun, 2:55 pm, Sunday school service; 3:15, Radio Chapel. Eastern.

WHAP, Decatur, Ill. 360 meters. 50 watts. Otto & Kuhns. No definite schedule.

WHAR, Atlantic City, N. J. 231 meters. 20 watts. Paramount Radio & Elec. Co. Daily, 2-3 pm, 7-9. Eastern.

WHAS, Louisville, Ky. 400 metera. 500 watts. Courier Journal and Louisville Times Co. Daily ex Sun, 4-5 pm, 7:30-9. Sun, 9:57-10:45 am, 4-5 pm, church service. Mon night, silent. Central.

WHAV, Wilmington, Del. 360 meters. 50 watts. Wilmington Elec. Spec. Co. Slogan, "The First Broadcasting Station of the First City of the First State." Sun, 10-11 pm. Eastern.

WHAZ, Troy, N. Y. 380 meters. 500 watts. Rensselaer Polytechnic Inst. Slogan, "Transcontinental and International Broadcasting Station Locsted at the Oldest College of Engineering." Club, R. P. I. students. Mon, 9-11 pm, concert, educational talks, features. Transcontinentsl second Mondsy of each month, 12-1:30 am music. Eastern.

WHB, Kansas City, Mo. 411 meters. 500 watts. Sweeney Auto & Electric School. Slogan, "Hesrt of America." Daily ex Sun, 8:25 am, 9:25, 10:25, 11:25, 12:25 pm, 1:25, 3, reports. Daily, 12:30-1, 2-3, 7-7:45 pm, music. Tues, Thurs, Sun, 8-10 pm, concert; midnight program. Central.

WHK, Cleveland, O. 283 meters. 100 watts. Warren R. Cox. Slogan, "WHK Cleveland." Daily ex Sun, 12:30-1:00 pm, music; 6-6:30, news, music. Fri, 9-11 pm, dance program. Sun, 8-10:30 pm, concert. Eastern.

WHN, New York, N. Y. 360 meters. 500 watts. Loew'a Stste Broadcasting Station. Slogan, "The Voice of the Great White Way." Daily ex Sun, 2:15-3:15, 3:45-5:30. Mon, Wed, Sat, 7:30-12 pm. Tues, Thurs, Fri, 9:30-12:00 pm. Sun, 3-6 pm, 9:30-12 pm. Eastern.

WIAB, Rockford, Ill. 252 meters. 50 watts. Joslyn Automobile Co. Mon, 9-10 pm. Fri, 8-9 pm, music. Central.

WIAC, Galveston, Tex. 360 meters. 100 watts. Galveston Tribune. Daily ex Sun, 12:35 pm, reports, occasional evening program. Centrsl.

WIAO, Philadelphia, Pa. 254 meters. 100 watts. Howard R. Miller. Irregular schedule.

WIAF, New Orlesns, La. 234 meters. 10 watts. G. A. DeCortin. Tues, 8-9:30 pm. Sun, 10-11:30 am. Central.

WIAI, Springfield, Mo. 252 meters. 100 watts. Heer Stores Co. Daily ex Sun, 10:30-11 am, reports, news, weather. Tues, 7:30-8:45 pm. Sat, 6:30-7:30 pm, music entertainment. Central.

WIAJ, Neenah, Wisc. 224 meters. 20 watts. Fox River Valley Radio Supply Co.

WIAK, Omaha, Neb. 278 meters. 200 watts. Daily Journal-Stockman. Daily ex Sun, 7:45 am, 9:10, 10:20, 12 m, 1:30 pm, 3:50, markets, weather. Centrsl.

WIAO, Milwaukee, Wis. 360 meters. 100 watts. School of Engineering of Milwaukee. Slogan, "In the Land of the Sky Blue Water." Mon, Tues, Thur, Fri, 10-10:30 am, 11:30-12 m, music, news; 5-6 pm, music, news; 7-8, music, speeches. Central.

WIAQ, Marion, Ind. 226 meters. 10 watts. Chronicle Pub. Co. Temporarily discontinued.

WIAS, Burlington, Ia. 360 meters. 100 watts. Home Elec. Co. Slogan, "Burlington, On The Mississippi." Tues, 8-9 pm, concert. Thurs, 7:15-3:15 pm, concert. Central.

WIAU, Le Mars, Ia. 360 meters. 20 watts. Am. Trust & Savings Bank.

WIK, McKeesport, Pa. 234 meters. 100 watts. K & L Electric Co.

WIL, Wasbington, D. C. 360 meters. 10 watts. Continental Elec. Supply Co. Discontinued temporarily.

WIP, Philadelphia, Pa. 509 meters. 500 watts. Gimbel Bros. Slogan, "Watch Its Progress." Daily ex Sun, 1-2 pm, 3-4:30, 6-6:45, music; 6:45, markets; 7-7:30 pm, bedtime stories. Tues, Thurs, 8-10 pm, concert. Tues, Sat, 10:10-12 pm, concert. Sun, 4-6 pm; 9:30-12. Eastern.

WJAD, Waco, Tex. 360 meters. 150 watts. Jackson's Radio Engineering Lab. Daily ex Sun, 4-4:30 pm, news, music. Mon, Fri, 8-9, concert. Sun, 11-12 am, church service. Sun, 7:30-8:30 pm. Central.

WJAG, Norfolk, Nebr. 283 meters. 250 watts. Norfolk Daily News. Slogan, "The World's Greatest Country Daily." Daily ex Sun 12:15 pm, 5, 5:30, reports. Sun, 3:30-6 pm, music. Central.

WJAK, Greentown, Ind. 254 meters. 25 watts. Rev. Clifford L. White. Slogsn, "The Radio Parson." Daily ex Sat, Sun, 6 pm; 6:30, children's hour. Thurs, 8 pm, music. Sat, 7 pm, sermonette music. Central.

WJAM, Cedar Rapids, Ia. 268 meters. 20 watts. D. M. Perham. Slogan, "Cereal City of the World." Daily ex Sun, 10 am, 11:30, 1:30 pm, markets, reports. Tues, Thurs, Sat, 6-6:30 pm, children's hour; 7-8, music. Sun, 2:45 pm, music. Central.

WJAN, Peoria, Ill. 280 meters. 100 watts. Peoria Star Slogan, "The Grandview City of Illinois." Daily ex Sun, 9 am, 9:15, 11:30, 1:30 pm, markets, weather agriograms. Tues, Thurs, 9:15-10:45 pm, concert. Sun, 11:30 am, 7:45 pm, church services. Central.

WJAQ, Topeka, Kan. 360 meters. 100 watts. Capper Publications. Irregular schedule.

WJAR, Providence, R. I. 360 meters. 500 watts. The Outlet Co. Slogan, "The Gateway of Southern New England." Daily ex Sun, 10-11 am. Housewives' talk, music. 1:05-2:15 pm, weather, reports, music; 7, weather. Tues, Wed, Fri, 7-8 pm, music. Wed, 10:30-12 midnight, dance. Fri, 8:15 pm, concert. Sun. 7:20-10:20 pm, concert. Eastern.

WJAS, Pittsburgh, Pa. 250 meters. 500 watts. Pittsburgh Radio Supply House. Daily ex Sun, 11:30-12 m, 2:30-3 pm, Mon, Wed, Fri, 7:45-9 pm. Eastern.

WJAT, Marshall, Mo. 360 meters. 10 watts. Kelley-Yawter Jewelry Co. Daily ex Sun, 5:15-5:45 pm, concert. Central.

WJAX, Cleveland, O. 390 meters. 500 watts. Union Trust Co. Slogan, "The Wave From Lake Erie." Daily ex Sat pm and Sun, 9-9:15 am, market review; 9:30-10, women's program; 10:05-10:45, 2-2:45 pm, 3-3:45, music, financial reports, news. Tues, 7:30-9:30 pm; Thurs, 8-10:30 pm, entertainment. Eastern.

WJD, Granville, O. 229 meters. 50 watts. Denison Univ. Fri, Sat, 5-6 pm, music, educational lectures. Central.

WJH, Washington, D. C. 273 meters. 50 watts. Wm. P. Boyer Co. Sun, 8 pm, church services. Eastern.

WJX, New York, N. Y. 360 meters. 500 watts. De Forest Radio Telephone & Telegraph Co.

WJY, New York City. 405 meters. 500 watts. R. C. A. Tues, Thurs, Fri, 7:30-11:30 pm, concert. Sun, 2:30-5 pm, 8-10:30. Eastern.

WJZ, New York, N. Y. 455 meters. 500 watts. R. C. A. Daily ex Sun, 3-6 pm, entertainment; 7-11:30 pm, special program. Sun, 11:00 am-1 pm, church service; 7-10:30 pm. Eastern.

WKAA, Cedar Rapids, Ia. 268 meters. 100 watts. H. F. Paar. Daily ex Sun, 12:45 pm, reports; 5:30, reports, agriograms; 6-7, music. Thurs, 11-12 pm, music. Sun, 4-5 pm, church service. Central.

WKAO, East Providence, R. I. 240 meters. 10 watts. Charles Looff.

WKAF, Wichita Falls, Tex. 360 meters. 100 watts. W. S. Radio Supply Co.

WKAN, Montgomery, Ala. 226 meters. 15 watts. United Battery Service Co. Wed, Fri, 8:30-9:30 pm, music, news. Sun, programs. Central.

WKAP, Cranston, R. I. 360 meters. 200 watts. Dutee Wilcox Flint.

WKAQ, San Juan, Porto Rico. 360 meters. 500 watts. Radio Corp. of Porto Rico. Slogan, "The Island of Enchantment, Where the World'a Best Coffee Grows." Wed, 6-8 pm, band; Fri, 6-8 pm, music, talks, entertainment, inter-colonial.

WKAR, East Lansing, Mich. 280 meters. 500 watts. Mich. Agri. College. Wed, 8 pm, college events. Central.

WKAV, Laconia, N. H. 254 meters. 50 watts. Laconia Radio Club.

WKAY, Gainesville, Ga. 280 meters. 10 watts. Brenau College. Thurs, 8:30 pm, concert, college activities. Eastern.

WKY, Oklahoma City, Okla. 360 meters. 150 watts. WKY Radio Shop. Mon, Thurs, 9-10:30 pm, concert. Thurs, 11:45-1:30 am, midnight frolic. Central.

WLAG, Minneapolis and St. Paul, Minn. 417 meters, 500 watts. Cutting & Wash. Radio Corp. Slogan, "The Twin City Radio Central in the land of Ten Thousand Lakes." Clubs, "Tooth Brush." "Postcard." Daily ex Sun, 9:30 am, 9:40, 10, 10:30, 10:45, 11:30, 11:35, 2 pm, 2:30, 2:40, 4, 4:30, 6, 7:30, 9:15, markets, lectures, music; 5:30-6 pm, children's program, Mon, Tues, Thurs, 6:15-7 pm, music. Wed, Fri, Sat, 9:30 pm, music. Sat, 11-12:30 am, music. Sun, 10:30 am, 3:30 pm, 7:45, church services. Central.

WLAH, Syracuse, N. Y. 234 meters. 100 watts. Samuel Woodworth. No regular schedule.

WLAK, Bellows Falls, Vt. 360 meters. 100 watts. Vermont Farm Machine Co. Daily, 9-11 pm. Eastern.

WLAL, Tulsa, Okla. 360 meters. 100 watts. Naylor Elec. Co. Wed, Fri, 8 pm, music. Sat, 6:45 pm, Bible class. Sun, 11 am, 7:30 pm, church services. Centrsl.

WLAP, Louisville, Ky. 360 meters. 20 watts. W. V. Jordon. Tues, Fri, 9:20-10 pm. Central.

WLAQ, Kalamazoo, Mich. 283 meters. 10 watts. Arthur E. Schilling. Daily ex Sun, 11:30-12:30 pm, Thurs, 10:30-12:30 pm, Sun, 2:30-5 pm. Central.

WLAV, Pensacola, Fla. 254 meters. 15 watts. Elec. Shop, Inc. Daily Mon, Tues, Fri, 8-9 pm, music, entertainment. Central.

WLAW, New York, N. Y. 360 meters. 500 watts. New York Police Dept.

WLAX, Greencastle, Ind. 231 meters. 10 watts. Greencastle Community Broadcasting Station. (Putnam Elec. Co.). Tues, 7:30 pm; Thurs, 7:30. Sun, 7:45 pm, church services. Central.

WLB, Minnespolis, Minn. 360 meters. 20 watts. U. of Minn. Dept. of Elec. Eng.

WLW, Cincinnati, O. 309 meters. 500 watts. Crosley Radio Corp. Daily ex Sun, 10:30 am, 1:30 pm; daily ex Sat. Sun, 3, 4, reports. Mon, Wed, 8-10 pm, entertainment. Tues, Thurs, 10-12 pm, music. Sun, 9:30 am, S. S. services; 11, 7:45 pm, church services. Central.

WMAC, Cazenovia, N. Y. 261 meters. 200 watts. C. B. Meredith. No definite schedule.

WMAF, Dartmouth, Mass. 360 meters. 500 watts. Round Hills Radio Corp. Slogsn, "The Voice from 'Way Down East." Temporsrily discontinued.

WMAH, Lincoln, Neb. 254 meters. 100 watts. General Supply Co. Club, "Lincoln Hoot Owls." Mon, Thurs, 9-10:30 pm, music. Sun, 7:30-9 pm, church services. Central.

WMAJ, Kansas City, Mo. 275 meters. 250 watts. Kansas City Daily Drovers Telegram. Daily ex Sun, 8:15 am, 9:15, 10:15, 11:15, 12:15 pm, 1:15, 2:15, weather, markets, news. Sat, 8-9 pm, music. Central.

WMAK, Lockport, N. Y. 360 meters. 500 watts. Norton Labs. Daily ex Sun, 11 am, weather, farm reports. Tues, 8-9 pm, music. Eastern.

WMAL, Trenton, N. J. 256 meters. 50 watts. Trenton Hdwe. Co. Slogan, "The Home of Good Music." Mon, Thurs, 7:30-9 pm, music, lecture. Eastern.

WMAN, Columbus, O. 286 meters. 100 watts. First Baptist Church. Sun, 10:30-12 m, 7:30-9 pm, church services. Eastern.

WMAP, Easton, Pa. 246 meters. 150 watts. Utility Battery Service Co. Irregular schedule. Eastern.

WMAQ, Chicago, Ill. 448 meters. 500 watts. The Chicago Daily News. Daily ex Sun, Mon, 7-8 pm, 9-10. Daily ex Sat, Sun, 4:30-5 pm. Wed, 1-2 pm, Assn. of Commerce Luncheon. Tues, Thurs, 2:35-3. Central.

WMAV, Auburn, Ala. 250 meters. 500 watts. Ala. Polytechnic Institute. Thursday, 8 pm, music; Sat, 8 pm, lectures. Central.

WMAW, Wahpeton, N. D. 254 meters. 50 watts. Wahpeton Elec. Co. Temporarily closed.

WMAY, St. Louis, Mo. 280 meters. 100 watts. Kingshighway Presbyterian Church. Slogan, "May Every By-Way Hear Kingshighway." Sun, 11 am, 8 pm, Tues, 7-8 pm, church services; Sun, 3 pm, Bible class. Central.

WMAZ, Macon, Ga. 268 meters. 50 watts. Mercer University.

WMC, Memphis, Tenn. 500 meters. 500 watts. The Commercial Appeal. Slogan, "Station WMC, Memphis. "Down in Dixie." Club, "Midnight Frolic." Daily ex Sun, 9:45 am, 12 m, 3 pm, weather, markets. Daily ex Sun, Wed, 8:30 pm, program. Tues, Fri, 11 pm. Midnight frolic. Central.

WMU, Washington, D. C. 261 meters. 50 watts. Doubleday-Hill Elec. Co. Temporarily discontinued.

WNAC, Boston, Mass. 273 meters. 100 watts. Shepard Stores. Daily ex Sun, 1-2 pm, 4-5, 8-10. Mon, Wed, Fri, 6-8 pm. Sun, 11-12 m, church services; 3-4 pm, concert; 7:30-9:30, church and concert. Eastern.

WNAO, Norman, Okla. 360 meters. 50 watts. Univ. of Okla. Daily ex Sat, Sun, 10-10:30, news. Mon, Wed, Sun, 9-10 pm, program. Central.

WNAL, Omaha, Nebr. 266 meters. 20 watts. R. J. Rockwell. Temporarily off air.

WNAN, Syracuse, N. Y. 286 meters. 100 watts. Syracuse Radio Tel. Co. Mon, Wed, Sat, 7:30 pm, concert, agriograms, etc. Eastern.

WNAP, Springfield, O. 275 meters. 100 watts. Wittenberg College. Fri, evenings, lectures by faculty, music.

WNAQ, Charleston, S. C. 360 meters. 10 watts. Charleston Radio Elec. Co.

WNAR, Butler, Mo. 231 meters. 20 watts. C. C. Rhodes. Fri, 9 pm; Sun, 11 am, 7:30 pm. Central.

WNAS, Austin, Tex. 360 meters. 100 watts. Tex. Radio Corp. (Austin Statesman.)

WNAT, Philadelphia, Pa. 360 meters. 250 watts. Lennig Bros. Co. Irregular schedule. Eastern.

WNAV, Knoxville, Tenn. 236 meters. 500 watts. People's Tel & Telg Co. Temporarily discontinued.

WNAW, Fortress Monroe, Va. 360 meters. 5 watts. Henry Kunzmann. Sun, 2-4 pm, 7-9. Eastern.

WNAX, Yankton, S. D. 244 meters. 100 watts. Dakota Radio Apparatus Co. Daily, 11:30 am, reports; 4:30 pm, reports, music. Wed, Sat, 9-10 pm, music. Central.

WNJ, Albany, N. Y. 380 meters. 55 watts. Shotton Radio Mfg. Co., Inc. Wed, 8:15 pm, concert. Eastern.

WOAC, Lima, O. 266 meters. 50 watts. Page Organ Co. (H. P. Maus).

WOAO, Sigourney, Ia. 360 meters. 20 watts. Friday Battery & Elec. Corp. Friday evening program.

WOAE, Fremont, Nebr. 360 meters. 20 watts. Midland College.

WOAF, Tylor, Tex. 360 meters. 10 watts. The Tyler Commercial College. Daily ex Sat & Sun. 12 m, weather, markets; 8 pm, weather, sports, codes; 10:15, U. S. Navy press. Sun, 11 am, 7:30 pm, church service. Central.

WOAG, Belvidere, Ill. 273 meters. 200 watts. Apollo Theater. Fri, 5:30-6:30 pm. Central.

WOAH, Charleston, S. C. 360 meters. 100 watts. Palmetto Radio Corp. Mon, Thur, Sat, Sun, 10 pm-1 am, music. Eastern.

WOAI, San Antonio, Tex. 385 meters. 500 watts. Southern Equip. Co. (Evening News-Express.) Daily ex Sun, 10:30 am, 12:15 pm, 3, 6:15, news, markets. Tues, 9:30-10:30 pm, concert, Thurs, 7:30-8:30 pm, concert. Sun, 11 am, church services; 9:30-10:30 pm, concert. Central.

WOAN, Lawrenceburg, Tenn. 360 meters. 200 watts. James D. Vaughan. Daily ex Sat, Sun, 8:30-9:30 pm. Eastern.

WOAO, Mishawaka, Ind. 360 meters. 50 watts. Lyradion Mfg. Co. Irregular schedule.

WOAP, Kalamazoo, Mich. 283 meters. 50 watts. Kalamazoo College. Slogan, The Old College in Michigan." Tues 7 8 [illegible] Central.

WOAR, Kenosha, Wis. 249 meters. watts. H. P. Lundskow. Wed, 7 pm. 6 pm Central.

WOAT, Wilmington, Del. 360 meters. 5 watts. Boyd Martell Hamp. Temporarily discontinued.

WOAV, Erie, Pa. 242 meters. 50 watts. Pennsylvania National Guard. Slogan. "Where Receivers Clear "Neversleep Club." Tues, 8 pm. Thurs, 8 pm, Sun, 9 30 pm, music. Sun, 1-4 am, Mariman's matinee. Sun, 10:30 am, 7:45 pm, church services. Eastern.

WOAW, Omaha, Neb. 526 meters. 500 watts. Woodmen of the World. Slogan. "Gateway to the West and to the East." Mon, Tues, Thurs, Fri, Sat, 6-7:30 pm, 9-11, concert. Sun, 9-11 am, 6-7 pm, 9-11. Central.

WOAX, Trenton, N. J. 240 meters. 500 watts. F. J. Wolff. Intermittent schedule.

WOC, Davenport, Ia. 484 meters. 500 watts. Palmer School of Chiropractic. Slogan, "Where the West Begins and in the State Where the Tall Corn Grows." Daily ex Sun, Tues night, 10 am, markets, 10 55, time; 11, weather; 12 m, chimes, 2 pm, markets; (Sat, 12.30), 3:30, talk; 5.45, chimes, ex Wed, 6 30, Sandman, 6 50, scores, weather. Mon, 10 pm, concert. Sat, 9 pm, concert. Thurs, 7 pm, orchestra. Mon, Wed, Fri, 8 pm, music. Sun 9 am, chimes; 1:30 pm, orchestra; 7, organ; 7:30, sports, 8, church services; 9, concert. Tues, silent. Central.

WOI, Ames, Ia. 360 meters. 100 watts. Iowa State College. Daily ex Sun, 9 am, 9:45, 10 15, market, weather, reports; 12 45 pm, markets, weather, educational talks; 9:30, weather, music. Central.

WOO, Philadelphia, Pa. 509 meters. 500 watts. John Wanamaker. Daily ex Sun, 11 am, organ recital; 11:30, weather; 11:55, time, 12-1 pm, concert. 4 45 pm, organ recital; 5, sports, police reports, 9 55, time; 10:02, weather. Mon, Wed, Fri, 7.30-11 pm, music, concert. Eastern.

WOQ, Kansas City, Mo. 360 meters. 500 watts. Western Radio Co. Daily ex Sun, 11, music, time signals. Tues, Thurs, Sat, 8-9:30, music. Sun, 11 am-1 15 pm, 7-7:45, church services. Central.

WOR, Newark, N. J. 405 meters. 500 watts. L. Bamberger & Co. Daily ex Sun, 2:30-4 pm, 6 15-7 30, music, talks, Mon, Wed, Sat, 8-11 pm, music, entertainment, lectures. Eastern.

WOS, Jefferson City, Mo. 441 meters. 500 watts. Missouri State Marketing Bureau. Slogan, "Watch Ozark State." Daily ex Sun, first 15 min. of every hr from 8 am-2 pm, markets. Daily ex Sat, Sun, 5 p music, markets. Mon, Wed, Fri, 8-9:30 pm, concert. Sun, 7:30-8:30 pm, church service. Central.

WPAB, State College, Pa. 283 meters. 500 watts. State College. Mon, Wed, Fri, 8-9:30 pm. Eastern.

WPAC, Okmulgee, Okla. 360 meters. 200 watts. Donaldson Radio Co.

WPAJ, New Haven, Conn. 268 meters. 30 watts. Little Radio Corp.

WPAK, Fargo, N. Dak. 360 meters. 100 watts. North Dakota Agricultural College. Daily, 10 am, weath Mon, Wed, Fri, 7:30-8.15 pm, music, lecture. dress. Central.

WPAL, Columbus, O. 286 meters. 100 watts. Avery Loeb Elec. Co. Eastern.

WPAM, Topeka, Kans. 360 meters. 100 watts. Abach & Guettel. Daily ex Sun, 1 pm, markets; 9:30-10:30 pm; Sat, 8-9 pm, music. Central.

WPAQ, Frostburg, Md. 360 meters. 10 watts. Gen Sales & Engineering Co.

WPAR, Beloit, Kansas. 236 meters 10 watts. Battery & Radio Co. Sun, 8 am, 11 pm. Cen

WPAT, El Paso, Tex. 360 meters. 20 watts. St. Patrick's Cathedral. Temporarily discontinued.

WPAU, Moorbead, Minn. 360 meters. 20 watts. cordia College.

WPAZ, Charleston, W. Va. 273 meters. 20 watts. Radio Shop. Mon, Wed, 7-8 pm. Fri, 7.30-8:30 Sun, 3-4:15 pm. Eastern.

WQAA, Parkesburg, Pa. 360 meters. 500 watts. H A. Beale, Jr. Temporarily discontinued.

WQAC, Amarillo, Tex. 234 meters. 100 watts. E Glsh. Irregular schedule.

WQAO, Waterbury, Conn. 242 meters. 50 watts. Whitall Elec. Co. Mon, Wed, Fri, 5:30-6.45 music, Boy Scout news. Eastern.

WQAE, Springfield, Vt. 275 meters. 50 watts. Radio News Station. Slogan, "Among the Hills of Vermont." Sat, 7:30-8 pm, 11-1 am. 8:30-9:30 pm, address. Eastern.

WQAF, Sandusky, O. 240 meters. 5 watts. Sandusky Register. Daily, 10:30 pm. weather.

WQAL, Mattoon, Ill. 258 meters. 10 watts. Coles County Tel. & Telg. Co. Slogan, "The Buckle on the Corn Belt." Wed, Sat, 9-10 pm, music, lecture; Sun afternoon, special program. Central.

WQAM, Miami, Fla. 283 meters. 100 watts. Electrical Equip Co. Slogan, "It is Always June in Miami." Daily ex Sun, 12-12:30 pm. Mon, 3-4 30 pm, 7 9:30. Tues, 8-9:30 pm. Sun, 9-10.30 pm. 1st Sun of month, 7.15-10.30 pm. Eastern.

WQAN, Scranton, Pa. 280 meters. 100 watts. Scranton Times. Slogan, "The Voice of the Anthracite." Daily ex Sun, 12:30-1 pm, 4-4:30, 7:30-8 news, reports, music. Tues, Fri, 8 pm, entertainment. Eastern.

WQAO, New York City, N. Y. 360 meters. 1 watts. Calvary Baptist Church. Sun, 10:30 am, 7:45 pm, church services. Eastern.

WQAQ, Abilene, Tex. 360 meters. 100 watts. West Texas Radio Co.-Abilene Daily Reporter Slogan, "The Capital of West Texas." Tues, Thurs, Fri, 8-9 pm. Sun, am, pm, church services. Central.

WQAS, Lowell, Mass. 266 meters. 100 watts. Prince-Walter Co. Daily ex Sun, 10.45-11 am, 2.30-3 pm, music. Mon, Wed, Fri, 6-7 pm, news, concert. Thurs, silent. Eastern.

WQAV, Greenville, S. C. 258 meters. 15 watts. Huntington & Guerry, Inc. Slogan, "The Textile Center of the South." Tues, Thurs, 7:30-8:30 pm, music. Sat 7:30-8 pm, music. Eastern.

WQAW, Washington, D. C. 236 meters. 5 watts. Dept. of Elec. Eng., Catholic University of America.

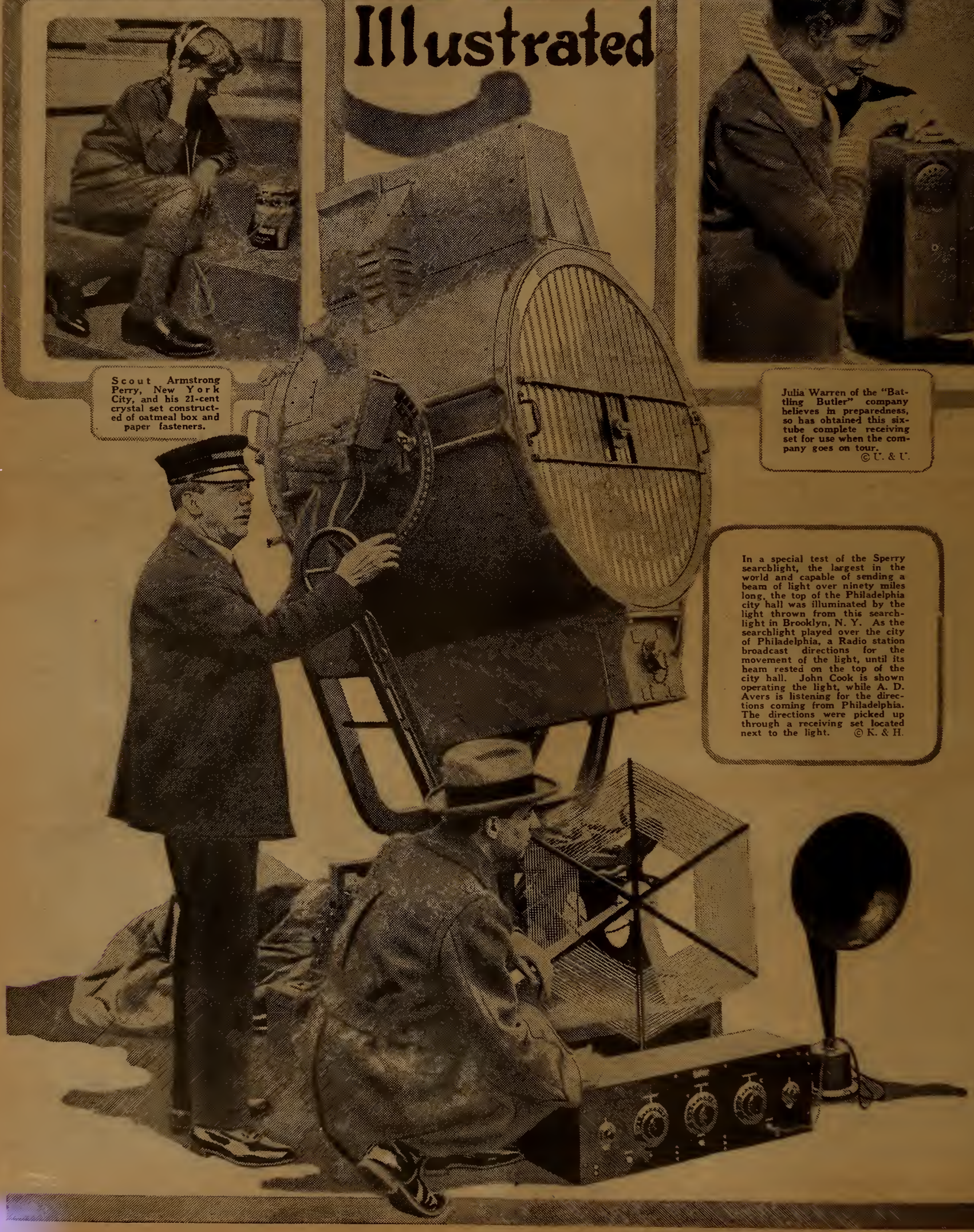
WQAX, Peoria, Ill. 360 meters. 100 watts. Radio Equipment Co. Mon, Wed, Fri. 7:15-8 pm. Central.

WRAA, Houston, Tex. 360 meters. 200 watts. Rice Institute. Mon, 8-9 pm, concert, college activities. Sun, 4:30 pm, extension lecturers. All games bro

Radio Illustrated

Scout Armstrong Perry, New York City, and his 21-cent crystal set constructed of oatmeal box and paper fasteners.

Julia Warren of the "Battling Butler" company believes in preparedness, so has obtained this six-tube complete receiving set for use when the company goes on tour. © U. & U.



In a special test of the Sperry searchlight, the largest in the world and capable of sending a beam of light over ninety miles long, the top of the Philadelphia city hall was illuminated by the light thrown from this searchlight in Brooklyn, N. Y. As the searchlight played over the city of Philadelphia, a Radio station broadcast directions for the movement of the light, until its beam rested on the top of the city hall. John Cook is shown operating the light, while A. D. Avers is listening for the directions coming from Philadelphia. The directions were picked up through a receiving set located next to the light. © K. & H.