

NEW CIRCUIT SENSATION

CLASS 'B' STATIONS ASK HIGHER POWER

ARE ALLOWED TO CHANGE
STATION CALL LETTERS

Broadcasters Want More Power to Help
Them in Overcoming Summer
Static Disturbances

WASHINGTON, D. C.—The department of commerce is giving favorable consideration to applications from owners of Class B broadcasting stations for permission to use higher power without requiring the increases to be made in steps of 500 watts as has been the practice heretofore, provided the stations are situated outside of congested receiving centers.

In taking this action the department is endeavoring to satisfy the demand of broadcast listeners that the use of increased power be permitted in order to overcome the existing static conditions.

WOC, Davenport, KFI, Los Angeles and KFKX, Hastings, are now on 2,000 watts. WLW and WSAI are on 5,000 watts power, while WEAF has raised to 2,500 watts.

Calls Can Be Changed

The department also has received numerous requests recently from broadcasting stations in various parts of the country that they be allowed to change their call letters so that they will have some significance.

Officials see no objection to this, it is said, as long as those stations west of the Mississippi begin their call letters with a K and those east of the Mississippi begin their call letters with a W in accordance with the present custom. Changes can be made of course in cases where the new call letters do not conflict with those already assigned.



TUNED BRIDGE R.F. RECEIVER BIG ADVANCE

Simplifies—Adds Power

Milo Gurney in Radio Digest Tells
Scheme for Compensating
Tube Capacity

Another new circuit! Three winners in Radio Digest this year, and now another appears. Although this circuit embodies the old tuned radio frequency principle, it has a new angle to it. One of the oldest faults in a receiving set was the balancing out of capacity in the tube.

This at last has been successfully accomplished in a new, revolutionary manner! Radio Digest is publishing for the first time authentic data which will enable anyone to make a set using this new circuit.

Greater Range Tube for Tube

Radio has made another noteworthy step forward in its progress. The never ceasing efforts of the many engineers constantly working toward improvements in Radio reception have met with success on one of the numerous problems that have been encountered. Radio fans can look forward next year to sets that are much easier to handle, much more

(Continued on page 3)



Above, Monimia Rubie, one of the best known of the Middle West's Radio stars. Miss Rubie is widely known as a singer. She is heard frequently from the Edgewater Beach hotel station, WEBE. To the right, Gladys Sarber of Station WMC, Memphis. Miss Sarber is not only the possessor of a wonderful contralto voice, but is also famed for her ability at the piano (and her southern beauty, we might add). At left, Mae Peterson Thompson, internationally famous prima donna, whose marvelous voice is often heard from Station WEAF.



COLHOUN, FAVORITE, WANTS NO GOLD CUP

WFAA MAN RESIGNS FROM 1925 ANNOUNCER RACE

Would Help Others—George Hay Keeps Lead While McNamee Draws Closer

Adams Colhoun, grand old man of WFAA, has repeated his act of 1924 and withdrawn from the 1925 Radio Digest Gold Cup Award for the world's most popular Radio announcer. Though a favorite with many and among the first sixteen leaders in the voting, Mr. Colhoun prefers to give his ardent supporters to the announcer of his choice.

Other features of the week in the Gold Cup race are: George Hay keeps his lead, but Graham McNamee is following with a close second and decreasing the distance between himself and Hay every day; Henry Field polled a heavy vote and advanced to third place, putting the Hired Hand in fourth; Gene Rouse made a spectacular advance from ninth to fifth place, polling approximately 1,100 votes, the largest number by any candidate during the week.

Lambdin Kay climbed to seventh from eighth, while H. W. Arlin slipped from fifth to sixth. Two other skids were N. Dean Cole, sixth to eighth, and W. G. "Bill" Hay, seventh to tenth.

New candidates in the top sixteen this week who have "made the grade" from obscurity are Richard Haller, thirteenth; John Daggett, fourteenth, and Kolin Hager, sixteenth.

Colhoun Explains Withdrawal

In the letter withdrawing from the race for the solid 14-carat gold cup, Adams Colhoun explained the motives for his move. He said:

"Personally, I have no desire for either the honor or the cup that goes with it. WFAA has four announcers. We get along famously.

"It would not enhance our good fellowship and splendid teamwork to have any one of the number declared the most popular announcer.

"To be frank about it, we know how good we are. What we want to know is what the public thinks of the fellows at the other stations. Millions of listeners have written WFAA, telling very plainly—with brutal frankness—what they think of us.

"We mean to announce the contest, to take sides enthusiastically and to tell our audience who is our choice. But we are not to be considered under any circumstances until we are offered the job of president of the League of Nations."

True sportsmanship, Mr. Colhoun!

Standing of Sixteen Leaders

The standing of the sixteen leaders at the close of last week was:

| Position | Name and Station | Votes |
|----------|------------------------|-------|
| 1. | George D. Hay, WFAA | 4,320 |
| 2. | Graham McNamee, WFAA | 3,779 |
| 3. | Henry Field, KFEE | 2,916 |
| 4. | The Hired Hand, WFAA | 2,876 |
| 5. | Gene Rouse, WDAV | 2,735 |
| 6. | H. W. Arlin, KODE | 2,193 |
| 7. | Lambdin Kay, WDAV | 2,085 |
| 8. | N. Dean Cole, WEEB | 1,838 |
| 9. | Robert Emery, WEEB | 1,751 |
| 10. | W. G. Hay, KFEX | 1,685 |
| 11. | Stanley Bernard, WFAA | 1,574 |
| 12. | Charles Erdstein, WTAR | 1,573 |
| 13. | Richard Haller, KGW | 1,459 |
| 14. | John Daggett, KRF | 1,448 |
| 15. | Jerry Sullivan, WQJ | 1,448 |
| 16. | Kolin Hager, WGY | 1,398 |

The nominations are decreasing in number, probably because the contest is nearly half finished, but still three new names were entered last week as follows: CKKL, A. P. Howels; WBBR, Victor Schmidt; WGY, Asa O. Coggeshall. The total number of gold cup contenders is

now 158. Although the new nominees have a hard path to travel, one of them may be a dark horse and spring a real surprise.

Watch for the Gold Cup standing next issue!

How to Vote and Get Bonus

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

The ballots, top of page two, numbered consecutively, will appear in each issue of the Radio Digest until the close of the contest, with the August 22 number.

Each of these ballots will count for one vote when sent in separately. You can hold these ballots until you have 4 that are consecutively numbered, and when

they are sent in a bonus of 8 votes will be allowed for your favorite announcer.

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

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

Sir Charles F. Higham, Britain's most eminent advertising expert, is now in the United States engaging in a tea propaganda campaign. He will broadcast from a number of stations throughout the country.

COUNTRY'S LEADERS IN CLEAR ETHER CRY

FIND VOTING BLANKS BACK KINTNER WAVE PLAN

Early Tabulations Show What People Want—Million Votes Goal of Campaign

CHICAGO.—The Kintner plan, as voted upon by "Consensus of Opinion" ballots now appearing in Radio Digest, is recognized as the supreme cure for the present bad attack of ether congestion with which Radio is now suffering.

The vote shows it. Tabulations on the first 10,000 ballots received are far from complete, but there is no question but that:

1. The public does not favor granting additional wave bands to new 500-watt stations.
2. Instead of releasing new wave bands, time should be divided by the present 500-watt and lower power broadcasters.
3. Superpower broadcasting stations are well liked, and need not, as long as they serve the public well, divide time with any other station.
4. Heterodyning and inter-station interference is very bad in nearly all sections of the United States.
5. The Kintner plan, or some similar scheme, is unanimously favored.
6. The appointment of an unbiased, non-partisan broadcasting control board for the division of time between stations and the assignment of wave bands, etc., is favored.

Leaders Compliment Campaign

From far and near come testimonial letters complimenting Radio Digest on starting the campaign against broadcast congestion. The country's leaders call it by far the most constructive work yet attempted in the Radio field.

Bolling Arthur Johnson, editor of the Lumber World Review, who for years has been considered a leader in editorial thought and a foremost figure in the lumber industry, has stamped his unqualified endorsement on the movement. He, like many other enthusiastic backers of the campaign, has offered his services as a newspaper man and authority to help.

H. M. Symons, deputy secretary of state of Wyoming, is another of the nation's leaders who has shown himself progressive to the extent of approving of the campaign. He adds, "I am not so familiar with some of the stations since the last allocation of wave lengths inasmuch as some of them heterodyne so badly that it is indeed painful to listen to them."

More Blanks Needed

Although the mail to Radio Digest is heavy with "Consensus of Opinion" voting blanks, at least a million votes are desired to make the proper impression on congress and show the legislators the state of affairs.

Many agencies are helping to distribute the blanks. Broadcasting stations, Radio clubs, manufacturers and dealers, and newspapers are joining in the battle and sending out the blanks in their mail. Many of these people have gone to the expense of printing their own copies of the voting blank. Radio Digest has printed a large supply of the blanks, so that readers not wishing to mutilate their copies, and non-subscribers can vote, but Radio Digest appreciates the sharing of the burden of printing expense which some of the volunteer campaigners are doing.

After a long absence from the "mike," King George was heard recently at the opening of the Wembley exposition.

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Looking Ahead

Comparisons of Tuned R.F. Circuits as they have never been taken up before, will be the basis for Milo Gurney's next article in his exclusive "scoop" series. Reading these earlier articles you are taken through all the ideas, both good and bad, that have been advanced so that the logical "bridge" hook-up and its advantages can be understood when Mr. Gurney presents it. This he will do in the third or fourth article. Don't miss a single article!

CKY, Manitoba's Only Broadcaster, will be described in next week's issue. Why CKY, announced as CNRW when Canadian National Railways programs are given, is the only broadcaster in Manitoba, is a story in itself. Watch for the pictures and story of CKY.

Lots of Interesting Things Are Happening now in the 1925 Gold Cup Award for the world's most popular Radio announcer, so watch the standing from week to week. Will George Hay keep the lead, or will Graham McNamee pass him? Or perhaps some "dark horse" may top the crowd next week. Who knows?

The A. B. C. Radio Course being written by Professor Moreton will take in more instruments next week. The article in this issue presents ammeters of the thermal type so that the veriest novice grasps their construction and the installment scheduled for June 6 is equally clear and concise.

Newsstands Don't Always Have One Left

WHEN YOU WANT

Radio Digest

YOU WANT IT!

BE SURE OF YOUR WEEKLY COPY BY SUBSCRIBING NOW

SEND IN THE BLANK TODAY

Publisher Radio Digest,
510 N. Dearborn St.,
Chicago, Ill.

Please find enclosed check **N. O.** for Five Dollars (Six Dollars) for One Year's Subscription to Radio Digest, Illustrated.

Name.....

Address.....

City.....State.....

STATION GLEANINGS AND NEWSY BRIEFS

WGBS PRESENTS OLD PLAY TAKEN FROM SANSKRIT

WLW Starts Dinner Hour Concerts—WJZ Broadcasts High School Courses—CKCL Opens

While many interesting dramatic offerings have come to the Radio audiences through the microphone of WGBS, there has rarely been any more unusual than the Hindu drama, "Life After Death" recently broadcast. It is adapted from the early Sanskrit, and the original was written five thousand years ago.

A new feature will be given from the Crosley WLW superpower station when the Hotel Gibson orchestra under the direction of Robert Visconti, will begin a dinner-hour concert on Monday, Wednesday and Thursday, from six to seven o'clock, Central Standard time.

Canadian Radio listeners were treated to an excellent program a few days ago when Toronto's latest broadcasting station, CKCL, went on the air for the first time. It is maintained by the Dominion Battery company, Limited.

Freeman H. Talbot, KOA studio director, will take the part of interlocutor in a minstrel show to be broadcast Friday evening, June 5, at 9:10 p. m. Central time.

Frank E. Dalton, one of the World's champion swimmers and owner of the Dalton School, New York, will continue his series of swimming lessons from WOR, every Monday.

"Faust," by Charles Gounod, was broadcast from WGBS Sunday night, May 17, at 9:30, in the series of specially adapted Radio grand operas sponsored by the Italian newspaper "Corriere D'America."

Crosley Station WLW broadcast the opening performance of the entertainment season at the Cincinnati Zoological garden on May 25.

The Childs Cup Race held on the Harlem River, Saturday afternoon, May 23, was broadcast by WGY and WJZ.

Station WJZ working in conjunction with the Board of Education of Westchester County has devised a system whereby high school subjects will be disseminated among the junior high school pupils of the East.

On May 28, WFAA broadcast a program of the Greek Letter men. A joint smoker of Beta and Omega Phis was held, after which the meeting adjourned to the Radio studio of the Dallas News and The Dallas Journal, from which the program was repeated, minus the smokes.

When large bands are heard from KPFI it is quite probable that they are playing out on the roof underneath the stars, to prevent crowding.

Announcement was made recently by

FOLLOWS PATH OF FAMOUS MOTHER



Bita Breen, 10-year-old daughter of May Singh Breen, famous banjo like artist, who is well known at all the New York broadcasting stations.

RECEPTION RUINED BY INDISCREET BIRD

BOSTON.—An English sparrow who insisted upon building a nest in a small fuse box on a 5,000-volt power circuit in South Weymouth, resulted in Radio reception being broken up for several weeks over an area of several square miles. This came to light recently when trouble shooters of the Weymouth Light and Power company, searching for the interference for weeks, were attracted to a fuse box while hunting for the trouble.

RADIO BEATS PILLS AS SURE REDUCER

CINCINNATI.—To be able to weigh 28 pounds less than they have weighed for several years is the ambition of many feminine fans. That this is possible, is proven by the appearance in the Crosley WLW studio of Miss Emma Theagy, 33 years old, who has been a member of the Y. M. C. A. Radio class in setting-up exercises. She lost the 28 pounds from February to April, by following the instructions of William Stradtman.

GIVE DANCING LESSONS FROM KYW

Boris Petroff, former Imperial Russian ballet dancer, and Dorothy Berke, who teach dancing by Radio in a weekly feature from KYW. Both are nationally known as dancers.



Edgar L. Bill, director of WLS, the Sears-Robuck station, Chicago, that the Crown Point Woman's club won the award for the best woman's club program over WLS.

Special children's games, something new in Radio broadcasting, were played during the Sandman hour over KOA at Denver, Wednesday evening, May 13.

Mountain sides in West Texas' Alpine convention city reverberated with the music of more than 20 massed bands recently during the first official concert of the seventh annual convention of the West Texas Chamber of Commerce at Mineral Wells, Texas. The musicians were on the side of East Mountain overlooking Convention Hall, and the music swept down into the crowded streets with a crescendo surge. More than 1,500 bandmen participated in the concert.

Most of the employes at the Mexican Gulf oil field workers camp at Tampico, Mexico, are pulling for the Pirates to win the National League pennant this year, and consequently have written to the Westinghouse Electric & Manufacturing company operating KDKA, at Pittsburgh, for a complete list of the hours at which the baseball scores are broadcast.

WDAG Musician-Composers Evoke Favorable Comment

AMARILLO, Texas.—Much favorable comment has been received by Station WDAG as a result of the enterprise of several of the regular performers who have taken to writing and performing their own music. Most of the musicians are beginners as composers, but from the volume and tone of fan mail wide applause and encouragement has been accorded them.

NEW BRIDGE CIRCUIT

(Continued from page 1)
reliable and able to consistently give a much greater range tube for tube than we now obtain. It will be possible with four or five tubes to accomplish the feats of volume and distance that now require 8 or 9.

There have been many problems before Radio scientists, among them being the elimination of static short wave transmission and a better means of reproduction than the present type of loud speaker. One of the most important to the Radio fan has been the improvement of the present type of tuned radio frequency receiver. The neutrodyne, as developed by Prof. Hazeltine, was a step in the right direction. Sets were developed in which no attempt was made to neutralize the inherent capacity of the radio frequency amplifiers. Instead, either the number of turns of wire in the primaries of the coupling transformers were reduced so that oscillation was impossible or resistances were inserted to introduce losses or keep down potentials. Now a new method of controlling the tendency of tubes to go into oscillation has been developed which promises a much brighter season ahead for Radio. The efficiency for each tube used as a radio frequency amplifier can readily be doubled or even tripled.

Three Circuits Developed
An interesting feature of this new development is the fact that it has been worked out by three different laboratories working individually, the experiments of each being unknown to the others. Strange to say, the circuit developed by one of the series of experiments is practically like the rest although there are slight differences as to minor details. They are all based on the use of a device long known to electrical engineering, the AC Wheatston bridge. The inherent capacity within the tube and the unbalanced effect on each side of the tube can now be compensated at any wave length. This not only produces better results in the receiver itself but will prevent radiation and the squeals caused in nearby receivers if uncontrolled regeneration is permitted to pass back to the antenna circuit.

Radio Digest has scooped the entire Radio press and secured an exclusive account of this new development. The series of articles explaining the history of radio frequency amplification and this new circuit is begun in this issue by Milo Gurney, well known in Radio circles as an authority, and will be found on page

GUESS-AGAIN-NIGHT LATEST FROM WLW

CROSLY STATION TO HOLD CONTEST ON JUNE 1

Game Is to Guess Names of Artists Furnishing Numbers—Prizes for Winners

CINCINNATI.—How often do you hear a Radio fan say: "I don't have to wait for the call letters of that station. The moment I hear that voice (or that orchestra, as the case may be) I know the station I'm pulling in."

But he rarely has a chance to put his confidence to the test, for along comes the announcer and tells him all about it. The question is: does the listener really know?

Some months ago the Crosley Station WLW here, ran the entire program without once telling its name or call letters, offering prizes to those who would write in to the unannounced station. The thousands of answers proved that the fans all over the country did know. But now WLW has devised a contest somewhat more difficult to solve. It will be called "Guess-Again-Night," and will offer an interesting riddle to fanland.

In order that those who listen may have some reward for their trouble, the Davis Reflectograph company is giving some interesting prizes for the best guessers.

How Contest Will Be Run
And this is the way the contest will be managed:

Artists, performers, announcers, speakers, orchestras and ensembles will be introduced by number. The selections will be very short, and at various times will be repeated so that the listener may "guess again." The program Monday, June 1, will run for an hour, from eight to nine, Central Standard time, at Station WLW of the Crosley Radio Corporation. The guesses of the listeners will be graded in percentages, and the guesser receiving the highest per cent will receive the first prize.

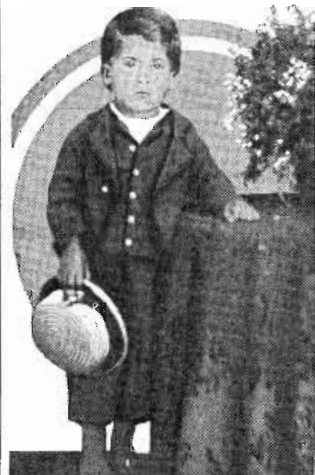
Prizes are to be furnished by the Davis Reflectograph company as follows: First prize, \$25.00 in cash; Second prize, \$10.00 in cash. In case of tie identical prizes with that tied for, will be awarded to each tying contestant.

For the next fifty best guessers, the prize will be a Davis Reflectograph worth \$5.00 each, shipped prepaid to the winner. This instrument enables anyone to draw with immediate accuracy, from living model, landscape, photograph or anything of that nature, and will be a joy to every boy and girl, man and woman interested in drawing or photography.

Alabama Polytech Gets Powerful New Station

BIRMINGHAM, Ala.—The Alabama Polytechnic institute, located at Auburn, Ala., is to have one of the most powerful broadcasting stations in the South. The plant was given to the institute by the Alabama Power company and was made by the power company at Birmingham, Ala. Dr. C. S. Yarbrough, mayor of Auburn, has donated to the institution a plot of ground on which this station will be located.

BEFORE THE SEED AND RADIO PERIOD



This picture of Henry Field of Station KPNE, Shenandoah, Iowa, was taken on a tintype—50 years ago.

Prest-O-Lite

RADIO CHART

| Voltage of Tubes | No. of Tubes | Type of Tubes (see foot-note) | Total Rated Amperes Drain | Recommended Prest-O-Lite "A" Batteries | | Recommended Prest-O-Lite "B" Batteries | |
|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------------|---------------------------|----------------------------------------|---------------------|----------------------------------------|--------------------------------------------------------------|
| | | | | Capacity (hours of use) | Price (approximate) | Capacity (hours of use) | Price (approximate) |
| 5-Volt Tubes <small>C-380 and UV-200 are interchangeable C-301A, DV-2 and UV-201A are interchangeable</small> | 1 | UV-200 | 1 | 69 WHR or 67 WHR | 22 | 22½-24 | One 24 XRR |
| | 2 | UV-201A | ½ | 67 WHR | 33 | 45-48 | One 48 XRR |
| | 2 | 1 UV-200 1 UV-201A | 1½ | 61½ WHR or 69 WHR | 22 | 90-96 | Two 48 XRR |
| | 3 | UV-201A | ¾ | 69 WHR or 67 WHR | 29 | 45-48 | One 48 XRR |
| | 3 | 1 UV-200 2 UV-201A | 1½ | 61½ WHR or 69 WHR | 14 | 67-72 | One 24 XRR One 48 XRR |
| | 4 | UV-201A | 1 | 67 WHR or 65 WHR | 16 | 90-96 | Two 48 LRR |
| | 4 | 1 UV-200 3 UV-201A | 1¾ | 61½ WHR or 61 WHR | 15 | 45-48 | One 48 LRR |
| | 5 | UV-201A | 1¼ | 69 WHR or 61½ WHR | 17 | 67-72 | One 24 LRR One 48 LRR |
| | 5 | 1 UV-200 4 UV-201A | 2 | 61½ WHR or 61 WHR | 13 | 90-96 | Two 48 LRR |
| | 6 | UV-201A | 1½ | 69 WHR or 69 KPR | 14 | 45-48 | Use combinations of LRR as specified above for same voltage. |
| | 8 | UV-201A | 2 | 67 KPR or 69 KRL | 15 | 67-72 | Use combinations of LRR as specified above for same voltage. |
| | For sets using current at a rate higher than 2 amperes. | | | | 2¼ | 67 KPR or 69 KRL | 19 |
| General Note: The Prest-O-Lite Co., Inc. | | | | 2½ | 69 KPR | 16 | |
| 3-Volt Tubes | 1 | | .06 | | 100 | 22½-24 | |
| | 2 | | .12 | One | 59 | 45-48 | Use same XRR and LRR combinations as above for same voltage. |
| | 3 | UV-199 | .18 | 43 MRR | 33 | 67-72 | |
| | 4 | C-299 | .24 | | 25 | 90-96 | |
| | 5 | DV-3 | .30 | Two 43 MRR in Parallel | 40 | 45-48 67-72 90-96 | Use same LRR combinations as above for same voltage. |
| | 6 | | .36 | | 33 | | |
| 1.1-Volt Tubes | 1 | | ¼ | One | 48 | 22½-24 | |
| | 2 | WD-11 | ½ | 23 MRR Twin | 23 | 45-48 | Use same XRR and LRR combinations as above for same voltage. |
| | 3 | WD-12 | ¾ | Two | 32 | 45-48 | |
| | 4 | C-11 | 1 | 23 MRR Twins in Parallel | 23 | 67-72 90-96 | |
| | 5 | C-12 215A | 1¼ | Three | 29 | 45-48 67-72 | Use same LRR combinations as above for same voltage. |
| | 6 | 215N | 1½ | 23 MRR Twins in Parallel | 23 | 90-96 | |



Write today for this free booklet

Whether you have a one-tube set or most advanced multi-tube outfit, you'll find a fund of interesting information in our booklet, "How to fit a storage battery to your set—and how to charge it."

This booklet gives you the complete Prest-O-Lite Radio Chart—technically accurate recommendations covering both "A" and "B" storage batteries for every type of set.

In addition, there is much vitally important data on battery care and upkeep—information that any radio fan will find of real value in keeping his set at its maximum efficiency. Write for your copy right now.



What size batteries will work best in your set?

SELECTING storage batteries of the right size and capacity is necessary, not only for the best reception, but also to arrange the time between chargings to suit your convenience.

The Prest-O-Lite Chart now makes this easy. Illustrated above is the master chart showing Prest-O-Lite Radio "A" Storage Batteries for all sets. You will find, in the fifth column, the Prest-O-Lite "A" Battery that fits your set exactly. Two sizes are recommended, but the larger capacity battery will be found more desirable unless facilities for frequent and easy charging are provided. (The days between chargings are based on an average use of your set of three hours a day.)

Use the "B" Battery combinations that give the plate voltage recommended for your set. These batteries will serve

two to four months without recharging.

You'll prefer Prest-O-Lite Storage Batteries because of their special features designed for better radio reception. Improved separators and plates insure steady, unvarying current and years of life. They're easy to recharge. Handsomely finished to go well with the finest sets. Prest-O-Lite Batteries offer you truly remarkable savings. Though standard in every respect, they are priced as low as \$4.75 and up.

Let the Prest-O-Lite Chart guarantee you batteries scientifically correct for your set. It is endorsed by the world's largest electro-chemical battery research laboratories. See it at your dealer's—or write for our interesting booklet, "How to fit a storage battery to your set—and how to charge it."

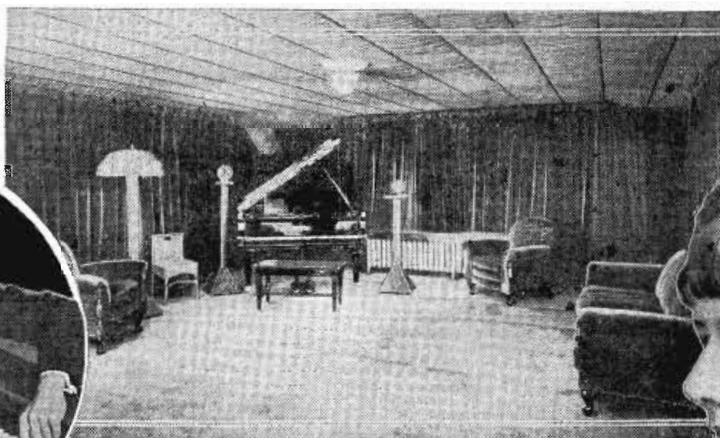
THE PREST-O-LITE CO., INC., INDIANAPOLIS, IND
New York San Francisco
In Canada: Prest-O-Lite Company of Canada, Ltd., Toronto, Ont.

Prest-O-Lite



Wherein Announcer "GG" Tells About KFAB

Gayle Grubb, the well-known "Announcer GG" of the Nebraska Buick company Station KFAB in Lincoln, Nebraska. Not only is GG one of the best known announcers in the business but he is also an entertainer of parts. He is shown below, seated at the piano.



To the left is shown the beautiful studio of KFAB. It is said by those who should know, that it is one of the most beautiful in the country. Below—Miss Olive Fletcher, the commander-in-chief of the ivories at KFAB.



By "GG", Announcer of KFAB

WELL, how's everybody? In writing this fable about our station we are first going to introduce Lincoln, Nebraska. W. J. Bryan, General Pershing and Vice-President Dawes paid taxes here for years. William's brother, Charlie Bryau, still has the pleasure. For first class musicians and educators, according to population, we take off our chapeaus to but one city and that is the city from whence comes the beau. Yessir, Boston.

Alright. Now for the plot. KFAB is a 500-watt station, owned and operated by the Nebraska Buick Automobile company. This is the largest concern of its kind in the United States. Not only do we distribute many a Buick, but we also sell any kind of automotive equipment on the market. The state of Nebraska and western Iowa depend on us for Zenith and Thompson Radio receiving sets. We also sell and distribute the sets in Nebraska, eastern Colorado and Wyoming, northern Kansas, southern South Dakota and western Iowa. (Advertisement.) H. E. Sidles is president of the company, Lee Huff, vice-president, and Charles Stuart, secretary and treasurer.

Now for paragraph three. Our studio is located on the mezzanine floor of the six story Buick building, and according to the Loos Brothers, WEBB artists, is the finest in the country. We also imagine that they include the city. We have velour drapes,

padded ceiling, grand piano, chairs and so forth. We have an individual announcing room adjoining the studio where we announce, read telegrams and sign off. The entire first floor of the Buick building is open to the public who are free to gather about the receiving set, installed to give them our programs hot off the bat.

Paragraph four. The operating room is on the sixth floor of the Buick building where the operator, Harry Harvey, watches that the high E by the coloratura soprano does not ruin the condensers. Harry is a great boy and does well even though married.

The studio director, Harry Sidles, tells the boys and girls not to fear the microphone and takes care of your entertainment, and A. L. Beghtol, manager of the station, keeps busy watching all of us. All I do is round up the programs and tell you about them on the microphone. Yessir, that's a fact!

Our staff artists are kept busy reading flattering reports from all over the country. It is also interesting to note that the preceding sentence is correct. Orville Andrews, the Buick

Warbler; Harriet Cruise, the Oriole of the Air; the Collegians orchestra; Olive Fletcher, commander-in-chief of the ivories; the Waukiki trio, Hawaiian entertainers; Verne E. Powell; the Saxophone Wizard and a couple of dozen more. You get 'em all during the week. I even play the piano when it is late—and we have signed off.

The station is one of the most widely known in the states surrounding Nebraska. Entertainers are drawn from all parts of the country, but for the most part they are men and women who live in the surrounding country. The residents of these parts seem to be partial to the real corn fed entertainers.

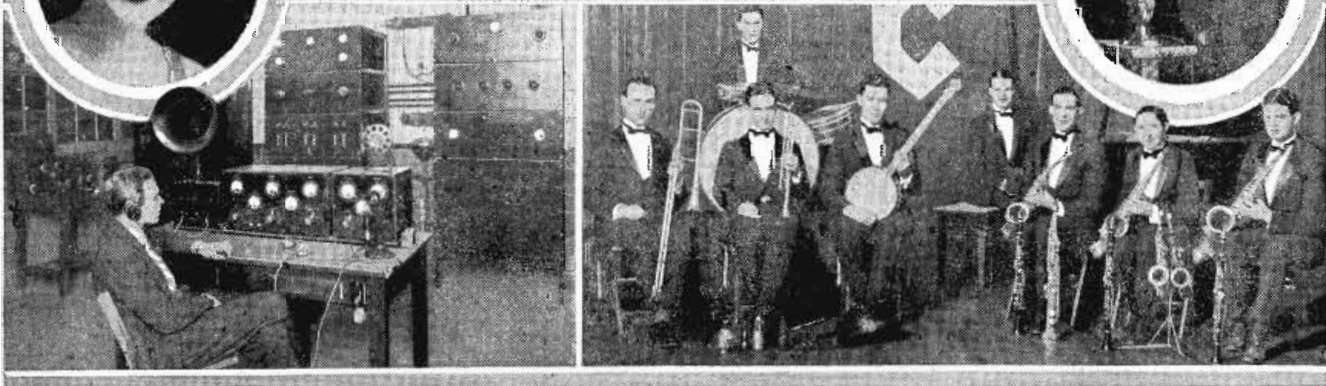
Although the station has been on the air for a considerable time with much lower power, during the past season an increase to 500 watts was made. This was done in response to repeated requests from hundreds of listeners in. With this improvement fan mail shows that we have been heard in nearly every state in the Union.

And when do we broadcast? Every Monday, Wednesday and Friday from 7:30 to 9:30 p. m., Central Standard Time. Every Tuesday and Saturday at 11 p. m. On Thursday at 3 p. m. and on Sunday afternoons at 4 p. m. We endeavor to do as H. E. Sidles has often remarked, "Give the public what they want."

Thanking you all for your kind attention and hoping that I can get this in the mail before C. L. Carper, the Buick Radio Man can see this sentence, I beg to remain yours till there is N. S. (No Static) G. G. signing off. So long, everybody!

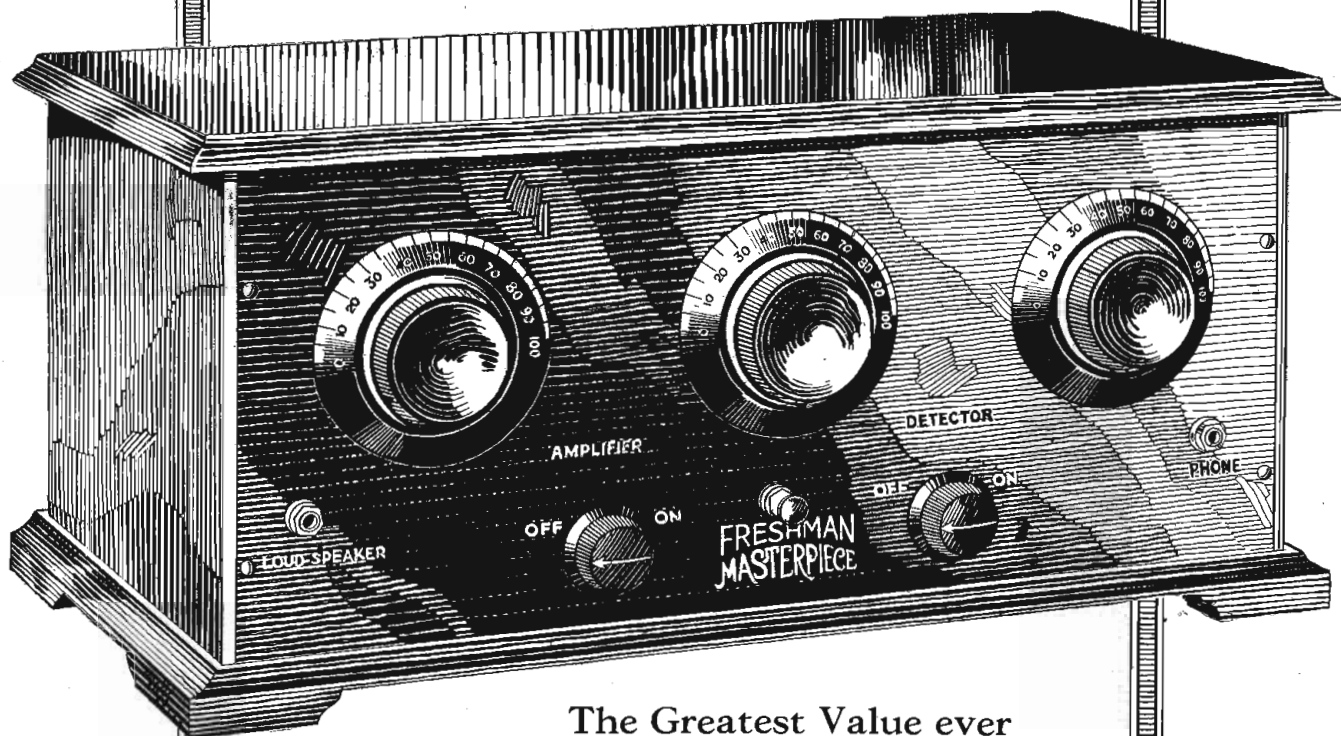
To left—Miss Edille Campbell, who plays the piano accordion at KFAB. Below Operating room. Right, Harriett Cruise, "Oriole of the Air."

To the right—Jerry Sidles, associate announcer, who is best known as "H. S." Below—The Collegians orchestra, one of the regular features of KFAB the Nebraska farmers lay down their hoos to listen to.



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WGN TO BROADCAST BIG MOTOR CLASSIC

DEVOTEES OF IRON STEEDS TO HEAR WHOLE STORY

Quin A. Ryan to Describe Famous Indianapolis Speed Contest from Brick Oval

CHICAGO.—Around and around the brick track they'll go—whirr! and whizz! and zipp!—in the Indianapolis Sweepstakes race, and every sound and every color of the auto classic will be brought into your home on Memorial Day by WGN, the Chicago Tribune station here on the Drake hotel.

This is the second year that WGN has broadcast the Indianapolis races direct from the track, adding another event to its long list of sporting broadcasts.

Quin A. Ryan, director and chief announcer of WGN, will report the races in the same deft and witty manner that made his gridiron broadcasting so popular last fall. From nine in the morning until four in the afternoon—Central Standard time—WGN will be on the air. Five microphones will be in use, one in the Judges' stand, one in the press box, one in Announcer Ryan's specially constructed tower, one in the "pits" and another suspended in the grandstand.

Every Detail to Be "Miked"

The broadcasting will be done under the auspices of the Presto-O-Lite company of Indianapolis. Engineer Paul G. Neal of WGN has arranged for telephone communication between all of the microphone locations, and all "mikes" will be linked with the A. T. & T. telephone lines to the station in Chicago.

Every incident of the pageant, every motor roar and snort, every note of the band music—and the band will number 1,075 pieces—you will receive from your loud speaker. The positions of the speeding cars will be given every twenty-five miles.

It has been arranged to have the winner of the race speak to the Radio audience at its conclusion, while the cheers of the 150,000 fans are still ringing over the track. All of the celebrities present will be presented to the microphone.

Announcer Ryan will handle the spectacle for the listeners as he has done the Kentucky Derby, the Chicago Cubs baseball games and the "Big Ten" football contests. Mr. Ryan is known as the greatest sports broadcaster in the West.

TRANSMISSION BY DRY CELLS IS SUCCESSFUL

Tests from Plane at Great Lakes Are Satisfactory

CHICAGO.—From the Great Lakes Naval Training station, near here, the first tests in history were made from an airplane in flight, using the new 37-meter Radio transmitter and receiver operated by dry cells only were recently made. Heretofore, all airplane Radio equipment has had its source of power from a small generator which was driven through a fan-shaped propeller by the force of the wind. In other words, when the engine and the airplane were out of commission, so was the Radio. This new transmitter which is being tested is the first of its kind and is one of the transmitters which will be used by the MacMillan polar expedition which sails from Boston, Bunker Hill Day, June 17, under the auspices of the National Geographic society.

The value of this type of equipment can be immediately realized when it is remembered that the airplanes that are to accompany the MacMillan expedition will fly over that great unexplored area lying between Point Barrow and the North Pole, in quest of new land.

British Will Broadcast an Independence Day Program

LONDON.—The British Broadcasting company hopes to arrange an exchange of greetings on Independence Day, July 4, in the form of specially arranged Radio programs between Great Britain and America. B. E. C. engineers are going into the question with their American colleagues, so that and broadcast celebrations, if such are possible, will befit the occasion.

SUCCESS AT START AMBITION OF WIBO



Top to bottom: Harry Geise, Ted Fiorito and Dan Russo

CHICAGO.—WIBO, Nelsou Brothers and the Russo-Florito Orchestral Exchange here, is the latest 500-watt member of the Chicago station group. Opening May 20 with a stellar program given by forty artists, WIBO has already made its 228-meter wave length a popular position for many dials.

Harry Geise, director and announcer who is famous as the "How-Do-You-Do Man," promises WIBO's audience several new features and novel surprises. He, with the assistance of Dan Russo and Ted Fiorito, co-conductors of the Oriole orchestra now playing at the Edgewater Beach Hotel, WEBH, will endeavor to please listeners with the best obtainable programs.

Engineer Philip Latin is responsible for the major part of the building of WIBO's water-cooled tube transmitter. Besides the unique transmitter, the studio of the new station is novel in that it is walled with Celotex lumber, claimed to have perfect acoustics for broadcasting. WBZ, Springfield, Mass., is one of the later studios which has employed Celotex lumber for walls and ceiling.

Ford and Glenn, WLS Artists, Start Tour

Lullabye Troubadors to Make Extensive Auto Trip

CHICAGO.—Ford and Glenn, Station WLS lullabye troubadors, will leave here June 1 for an extensive tour of the country. They will journey to the Pacific coast in automobiles and perform at various stations on the trip.

Both the youngsters and the grown-ups will miss these two entertainers while they are absent from their home station, Glenn, or little Glenn as he is more commonly known, is the leader of the WLS Cornhuskers, a group of musicians who entertain from this station. Most of all, they will be missed by the lullabye listeners who are dependent on them to put them to sleep every night.

A Nevada Radio Fan? Never Heard of One!

KTHS Has Letters from All But "Silver State"

HOT SPRINGS, Ark.—Has Nevada a receiving set? Or is it the great commonwealth known as the "Silver State" has never been invaded by the Radio bug?

A careful analysis of the inquiries received by the New Arlington hotel station here, KTHS, reveals that in a period of three months every state in the union and several foreign countries have picked up the local station. But not a word from Nevada.

Can it be that most of the Nevadans are too busy with domestic triangles to fall in line with America's favorite form of recreation and entertainment—the Radio game?

McNAMEE WINS N. Y. ANNOUNCER CONTEST

NOSES OUT BROCKENSHIRE BY FOUR-TENTHS POINT

Barnett, Reed, Caslin, Squires, Granland, Haupt, Cross and Morgan Follow in Order

NEW YORK.—Graham McNamee of WBAF has been selected as the best all-around New York announcer by the Radio voice technique committee of New York university. McNamee nosed out Brockenshire of WJZ by the small margin of four-tenths of a point, the scores being \$7.3 for McNamee and \$6.9 for Brockenshire.

This committee meeting terminated the series of three which were held during the past four months under the direction of R. C. Bordon and A. C. Busse, voice experts of New York university, to determine the ideal qualities to be looked for in Radio announcers. The aim of the committee, which is composed of Radio editors, dramatic critics, and members of the faculty of the university, is not to standardize the voice and art of broadcasting, but to point out faults to be avoided and to determine what the public prefers to hear.

Make Phonograph Records

Special phonograph records were made by Mr. Bordon and Mr. Busse of representative announcers from the following nine New York stations:—WJZ, WBAF, WGBS, WHN, WEEJ, WOR, WAHG, WMCA, and WBBR. Each announcer passed upon his own record and all those entered in the contest had been accepted by the makers as fairly representative of their work.

Ten men out of the number considered were chosen as the best local announcers. In addition to McNamee and Brockenshire they are Barnett of WOR, Reed of WJZ, Caslin of WBAF, Squires of WMCA, Granland of WHN, Haupt of WBAF, Cross of WJZ and Morgan of WGBS.

The committee rated the records upon the points which were decided upon at earlier meetings as those most desirable for Radio announcing. They are as follows:—(1) Average rate of speaking—175 words a minute. (2) Pitch of voice—low middle range. (3) Announcements should be made with variation of rate, pitch and stress. (4) Manner of announcer—formal but friendly. (5) Distinctness and enunciation.

ISAACS, EX-MARCONI AID, DIES SUDDENLY

LONDON, Eng.—Godfrey Isaacs, late managing director of the Marconi company, and brother of the Earl of Reading, Viceroy of India, has just died in his country house at Virginia Water, Eng., aged 59. He had been ill for several days. When Mr. Isaacs resigned from the managing directorship of the Marconi company last November, he declared that he had worked for 43 years without a holiday, and his greatest need was sleep and peace.



Godfrey Isaacs

In 1910 he was invited by Senator Marconi to become managing director of the Marconi company. During the 14 years he held the position, which covered an area of enormous Radio development, he played a part which, both from the physical and mental viewpoint would have been an unbearable strain for most men.

In the end he himself had to give in under the wearing, tiring work, which had been begun in an anxious and exciting atmosphere engendered by the raging political controversy which enveloped the firm and continued under high pressure until his retirement. He insisted that each colony could be placed in direct touch with England by Radio, a view which was challenged by the Imperial Radio committee.

The Marconi company then demonstrated the possibility of direct communication with Australia by sending a message from Carnarvon, Wales. The Australian and South African governments then granted the Marconi company concessions to erect stations for direct communication with England, and the British government reversed its previous decision and decided to erect an immense station at Rugby.

PETE AND MULE ARE FAVORITES AT KFDM



Listeners who regularly dial KFDM, Magnolia Petroleum Co., Beaumont, Texas, know "Petroleum Pete" and his mule, Pete, for the benefit of those in doubt, is the gentleman to the right.

GREBE OPENS BIG NEW STATION IN NEW YORK

Galaxy of Stars Participate in WBOQ Inaugural

NEW YORK.—Opening of the new A. H. Grebe station, WBOQ, was celebrated on May 14 when it went on the air officially with a remarkable program, which included performers culled from almost every walk of professional life.

WBOQ has for the past several months been an experimental station. Recently it was decided to turn it into a regular broadcasting plant and the present beautiful and powerful studio and plant is the result. It operates on 500 watts over a wave length of 236 meters.

The Grebe company are also owners of Station WAHG, portable transmitters WGMU and WRMU and the two experimental stations, 2ZV and 2XE. WBOQ is located at Richmond Hill on Long Island and is operated through remote control from the studio in the Hotel Plaza.

Marie Dressler is the announcer. The station will broadcast a daily program.

Fan Asks Log Stamps Be Sent by Air Mail

Log Stamp Idea Takes Radio Fans' Fancy

CHICAGO.—The hours seem long from the time that a station is heard and a verification stamp, as proof of reception, is received. A fan in Denver, Colo., recently sent a letter to station WBZ in Springfield, Massachusetts, by air mail, with a request that a verification stamp be sent to him by return air mail.

The Ekko company, which originated the stamp idea, reports that over 250 stations are now supplied with stamps, and that a few of the large stations which do not have stamps are verifying reception and forwarding the letters to the Ekko company, which sends the stamps direct to the listeners. This list includes 80 per cent of the stations that are heard regularly and are received by the greatest number of fans. The stamp concern also states that new stations are being supplied with stamps at the rate of three or four a day.

Critics Acclaim Former KGO Actor's First Play

SAN FRANCISCO.—From the Radio drama to a successful playwright production on Broadway, New York, is the story of Dan Totheroh, former star of the KGO Radio players, known to millions by the sound of his voice, whose play, "Wild Bird," is now running in Cherry Lane playhouse, New York city.

New York critics were reported to be enthusiastic in their reception of the play "Wild Birds" at its recent New York opening, pronouncing the author "rich in ideas," and his play "aglow with imagination and instinct, with new life full of fresh strength."

SHRINE WEEK PROGRAMS HEARD AT KHJ

Sunday, May 31

(Continued from page 3)

WGR, Buffalo, N. Y. (319), 8-4 p. m., vesper service; 4-5, John F. Gauderer, Jr., organist; 7-45, Central Presbyterian church organ recital and service; William Wall Whidditt, organist, and Dr. Robert J. MacAlphine, speaker.

WHAR, Atlantic City, N. J. (275), 9 p. m., Sea-side hotel trio; U. Strand theater organ recital.

WHN, New York, N. Y. (360), 7-4 p. m., Queens County Christian Endeavor program; 4:30-5, program Music Lovers association; 5-5:30, Rosefield dance orchestra; 5:30-6, Olcott Vail and his string trio; 10-10:45, Lena Jazor entertainers; 10:45-11:15, Janssen's Hofbrau orchestra.

WIP, Philadelphia, Pa. (306.2), 10:45 a. m., services, Holy Trinity church.

WIAP, Providence, R. I. (305.9), 7:30-8:15 p. m., Roxy and his Gang; 9:15-10:15, organ recital, New York studio.

WJY, New York, N. Y. (465.2), 8:15-9:15 p. m., Bernard Lavitza's Hotel Commodore concert orchestra.

WJZ, New York, N. Y. (454.3), 8-10 a. m., children's hour; 10:10-10:30, chimes from Grace church; 7-10:45, Chamberlain Women's quartet; 5:30-6, Dextra male chorus.

WKAR, San Juan, P. R. (340.7), 8-10 p. m., municipal band.

WLIT, Philadelphia, Pa. (394.5), 2:35 p. m., Arcadia cafe concert orchestra.

WMCA, New York, N. Y. (341), 7-7:30 p. m., Ernie Golden and his Royal Melodians orchestra.

WNYC, New York, N. Y. (226), 4-6:30 p. m., band concert; 9-11, Brooklyn Park Strand theater program.

WOD, Philadelphia, Pa. (306.2), 2:30 p. m., services, Bethany temple organ recital, Caroline Quigg; sermon, Rev. Gordon A. McManis; 2:30 p. m., Sunday school services; 6, organ recital, sacred hymns, Clarence K. Barden.

Eastern Standard or Central Daylight Saving Time Stations

KOKA, Pittsburgh, Pa. (309.1), 9:45 a. m., Calvary Episcopal church; 3 p. m., Dr. Charles Heinrich, or-

WLV, Cincinnati, Ohio (422.3), 9:30 a. m., school, Editorial Staff of Sunday school Publications, Methodist Book concern; 11, services, Church of Christ; Dr. Frank Stevenson; 7:30 p. m., services, First Presbyterian church, Dr. Frederick McMillan; 8:30, Western and Southern orchestra, William Kopp, director; soloist, Katherine Reese Haun, soprano.

WORD, Batavia, Ill. (275), 10 a. m., hymns, sacred songs; Bible lecture, D. J. Monahan; 6:45 p. m., Louis Zander, violinist; Mrs. Zander, accompanist; 8:15, B. S. A. choral singers; "The World Shall Be Established: Millions Now Living Will Never Die," Calvin H. Swingle.

WQJ, Chicago, Ill. (447.5), 10:30 a. m., Dr. Preston Bradley's sermon; 2-4 p. m., Sunday afternoon concert program, Ambrose Wyrick, director; 8-10, Ralph Williams and his Rainco Garden orchestra; Lillian Schoeninger, soprano; Esther Block, contralto; Emily Volker, violinist; Lois Curtis Nelson, accompanist; Kenneth Sterling, tenor.

WRFB, Lansing, Mich. (225.5), 10-10:25 a. m., Balfy Plymouth Congregational church; 10:30, St. Paul's Episcopal church; 7:30, First Baptist church, Rev. Ralph W. Hobbs.

WSA, Cincinnati, Ohio (326), 3 p. m., sermonette, sacred chimes.

ginalist Presbyterian church; 9:30-11, Grace Methodist Episcopal church, south.

WHAD, Milwaukee, Wis. (275), 2-3 p. m., Marquette university studio program.

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

WHO, Des Moines, Iowa (520), 11 a. m., University church service; 4 p. m., program, Dean Holmes Cooper; 7:30, Recs-Hughes orchestra.

WOAN, Lawrenceburg, Tenn. (282.8), 9-10 p. m., sacred orchestra, male quartet.

WOAW, Omaha, Neb. (526), 9 a. m., Radio chapel service; 2:15 p. m., First Christian church orchestra; 5, musical chapel.

WOC, Davenport, Iowa (483.8), 8 p. m., services, Rev. Myraudale Seymour; boy's choir, Sacred Heart cathedral; 9:30-11:30, Palmer Little Symphony; Edwin Swindoll, conductor.

WOF, Ames, Iowa (270), 10-10:45 a. m., chimes; 11, chapel service; Dr. Myron L. Rouser.

WOS, Jefferson City, Mo. (446.9), 7-5 p. m., Episcopal church, Rev. G. E. Hendon, rector.

Monday, June 1

Monday, silent night for: **CKAC, CKY, CMRT, KFD, KFMO, KFMA, KGW, KHJ, KYW, PWX, WAMD, WBBM, WBGN, WCAU, WDFW, WEOB, WESH, WGN, WGBS, WHAS, WJY, WKAG, WJLB, WLS, WMAQ, WMBB, WOC, WOA, WJL, WRC, WRED, WSAC.**

Atlantic or Eastern Daylight Saving Time Stations

CKAC, Montreal, Can. (410), 4:30 p. m., 10 lessons.

WAHG, Richmond Hill, N. Y. (315.6), 7:45-8:15 p. m., De Molay glee club; 8:15-8:30, Horace J. Taylor, leader; 8:30-8:45, Mildred Nash Convention, soprano; 8:45-9, Steudler Cambria, concert mandolinist; 9-9:30, Synphonique orchestra; 9:30-9:45, William Nelson, bass; 9:45-10, Mildred Nash Convention; 10-10:30, Synphonique string trio; 10:30-10:55, Stray concert ensemble; 11-11:15, Stray's symphony.

WBWR, New York, N. Y. (272.6), 8 a. m., Syrian Oriental music, Toussaint Moubaid, Elizabeth Awa; 2-5, World News Digest; 6:30, "Harp of God"; 8:30, vocal selections; 8:50, Syrian Oriental music.

WBZ, Springfield, Mass. (333.3), 6 p. m., Hotel Hamilton trio; 8, George's Hotel Concert, Charles Vander; 8:15, Alice Welch, soprano; 8:15, Best Opera Co. University extension course; 8:30, Lincoln Automobile; Donald Evans, baritone; 8:45, Hamilton Academy glee club; 9:10, baseball.

WCAE, Pittsburgh, Pa. (461.3), 6:30 p. m., William Penn hotel; 8, address, Avonlea Pittsburgh Personnel association; 8:30, concert; 9, A. & P. Opera string ensemble; 11, The First Embassy; Blackstone theater orchestra.

WEAF, New York, N. Y. (461.5), 8-7 p. m., dinner music, Walter Lister; 7-7:15, "The Curse of the Masher—the Patrol," William Madson, Chief City Music; 7:15-8:30, program, Mark Brand theater, direction of Joseph Frankfort; 8:30-8:45, Elton Smith, pianist; 8:45-9, health talk, Menopausal life insurance company; 9-10, A. & P. Opera; 10-10:30, Blue Ribbon quartet; 10:30-11:30, Ben Barnea and his Hotel Hamilton orchestra.

WEI, Boston, Mass. (475.9), 3 p. m., Sterling Inn band; 4, Maize Mayo; 5:30, Jack Brown and his Chauve Souris orchestra; 6:50, Big Brother club; 7:30, musical; 8, Soukalee; 8:45, Tower Lawn band; 9, A. & P. Gypsy; 10, Blue Ribbon quartet.

WFI, Philadelphia, Pa. (394.5), 6 p. m., dance music;



Martha Ellen Abt, personal analyst and lecturer, photo at left, whose pioneering is creating great interest in medical circles. Mrs. Abt has broadcast from a number of stations, but her more recent appearances have been from WLS and WQJ, Chicago. Her next lecture from WQJ, "Health from Your Kitchen Garden," will be given Wednesday, June 3, at 11 a. m., Central daylight saving time. She will talk Thursday, June 4, at 4:45 p. m., Central daylight saving time, from WLS on the subject, "Making Your Kitchen a Service Station for Health." June 17 and 24 she will be heard again at WQJ. Helen Knell (above) will entertain Monday afternoon at WGR, Buffalo. Bob Miller, director of Bob Miller's orchestra, will resume his Friday midnight frolics at WMO, Memphis.

ganist; 8:45, St. Albans Presbyterian church; 7, bass recital, services, Washington Technical night school.

WBBM, Chicago, Ill. (286), 4-6 p. m., tea given program; Sandy Meek, vocal solo; Jerry Cronack; Harry Suck, pianist; 8-10, Sandy Meek, vocal solo; Ned Santay; Remington Sisters trio; Harry Suck, pianist; Tiny Dave Studman; Ed Barr, ukulele soloist.

WBCN, Chicago, Ill. (267.2), 4-5 p. m., Latin & Son classical concert; 7-8, classical concert; 8-11, Midway orchestra; Henry Veda, tenor; Elsie and Gertrude; Hungarian Harmonica variety.

WCC, Detroit, Mich. (516.9), 10:30 a. m., services, Central Methodist Episcopal church.

WEAR, Cleveland, Ohio (389.4), 8:30-8:55 p. m., Hotel Cleveland orchestra; 9-10, evening hour program.

WBCH, Chicago, Ill. (370.2), 7-9 p. m., artistic program.

WGES, Oak Park, Ill. (250), 6-7 p. m., classical program; Edwin Kemp, tenor; Byron Abbott, baritone; Howard Neumann, pianist; John Stamford, tenor; 10:30-11, popular program; A. Cardello and his 11 Master Musicians; Rudolph Hess, pianist; Antonio Scarlatti, tenor; Michelle Wilson, pianist.

WGN, Chicago, Ill. (370.2), 2-30 p. m., Chicago Musical College; 9-10, Drake concert ensemble.

WGY, Schenectady, N. Y. (379.9), 10 a. m., St. George's Episcopal church; 2:35 p. m., WCV Symphonics orchestra; Helen Kiddle, soprano; 6:30, St. George's Episcopal church; 7:45, Hotel Commodore orchestra; 9, George's Hotel, symphony concert.

WHT, Deerfield, Ill. (339.8), 8:30 p. m., Tabernacle evening service; 9, Radio sing song service; 9:30, Radio quart; 10, Paul Rader and staff; 10:30, home hour.

WHD, Chicago, Ill. (226), 6-8 p. m., Ingram Cleveland, violinist; Sherman J. Technentie, baritone; Edith Phillips Keller, pianist; Billy Madden, tenor; 10-12, Vio Latham, vocal solo; Lina, accompanist; Don Rallo, violinist; 12, Puerto, pianist.

WJDD, Measethart, Ill. (302), 12 midnight, Lillian Bernard, Florence Henry, Leo Carretto, Walter Fell, Dick Wall, Charley Strachan orchestra.

WKRC, Cincinnati, Ohio (322), 2:45 p. m., Walnut Hills Christian church; 10, musical program.

WLS, Chicago, Ill. (344.6), 7:30-8 p. m., Ralph Emerson, organist; Little Brown church; 8:55, Little Brown church choir.

WTAS, Elgin, Ill. (302.8), 2:15-5 p. m., Joe Rudolph and the Big's own orchestra; 8-12, Radio concert; Joe Rudolph and the Boss's own orchestra; Frank Morris, Polly Willis, Fannie and Eddie Cattanach, Coleman Costa, p. m., tenor artist; Ladies' quartet.

WWI, Detroit, Mich. (352.7), 11 a. m., St. Paul's Episcopal cathedral; 2 p. m., Detroit; News orchestra; Coleman Costa, p. m., tenor artist; Ladies' quartet.

Central Standard Time Stations

KFB, Lincoln, Neb. (240), 9 p. m., Rev. F. A. Lens.

KFDM, St. Louis, Mo. (315.6), 11-12 p. m., sacred program; 8-9 p. m., sacred program.

KFMA, Northfield, Minn. (536.9), 7 p. m., college vesper service.

KNF, Shenandoah, Iowa (266), 10:45 a. m., First M. E. church; 2:30 p. m., Rev. and Mrs. Hanley; 3, patriotic concert; 6:30, Golden Rule choir; 8, Christian church.

KPIB, Bristol, Okla. (394.5), 9:30 a. m., Sunday school; 11, sermon; 5 p. m., vesper service.

KIDS, Independence, Mo. (268), 11 a. m., Stone church.

KJMS, Hot Springs National Park, Ark. (314.3), 11-12:30 p. m., Central Methodist church; 8:30-9:15, New Arlington Meyer Davis orchestra; 9:15-9:25, baseball; 9:25-10, De Luxe concert; 10-11, Chuck Root's De Luxe orchestra.

WAND, Minneapolis, Minn. (243.8), 8 p. m., Hazel Wood, organist; 8:30, Berrie Brown, cellist; Bayle Canada, soprano; Mildred Getting, pianist; George Kessler, tenor; Marion Sacrestain Barona, violinist.

WBAP, Fort Worth, Texas (475.9), 11 a. m., First Methodist church; 12:30 p. m., Uddes' hour, Uncle Billy; 11, minstrel frolic.

WCCB, Zion, Ill. (344.6), 3 p. m., mixed quartet, string quartet; Mrs. Thomas, soprano; Mrs. LaRose, contralto; vocal trio; Mrs. S. D. Hagan, soprano; Chester Bang, baritone; Richard P. Hirt, violinist; Paul Stewart, cornetist; Mrs. A. E. Hunsberger, pianist; Edith Taylor, reader.

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

WDAF, Kansas City, Mo. (385.6), 4-5 p. m., classical music; 5-5:30, Sunday school lesson, Dr. Walter J. Wilson.

WFAA, Dallas, Texas (475.9), 6:50-7:30 p. m., Radio Bible class, Dr. William M. Anderson; 8-9, West-

WBB, Atlanta, Ga. (428.3), 5-6 p. m., services, Chifton and the West's.

WBU, Iowa City, Iowa (483.6), 9 p. m., familiar hymns.

Mountain Standard Time Stations

KOA, Oakland, Calif. (322.4), 10:55 a. m., First Unitarian society; 4 p. m., Sunday afternoon music, Mrs. Thye Rowell, organist; 7:45, commemoration life and works of Ralph Waldo Emerson.

Pacific Standard Time Stations

KFI, Los Angeles, Calif. (467), 6:50 p. m., McDonald's nightly doling; 6:45-7, Father Richard's sun-spot weather forecast, musical appreciation talk; 7-8, from stage and studio of Metropolitan theater, Albert Kaufman, director; 8-9, Victor Moore's concert trio; 9-10, Hummer; 10-11, Union and his Louisiana Five; 10-11, Pasadena Right dance orchestra, direction Bill Hennessy; 11-12, music and press agents.

KGD, Oakland, Calif. (362.1), 11 a. m., First Baptist church; 3:30 p. m., KGO Little Symphony orchestra; 7:45, First Baptist church.

KGW, Portland, Ore. (491.5), 10:30-12 m., First Presbyterian church services; Dr. Harold Bowman, pastor; 6-6:45 p. m., services, Church of Our Father (First Unitarian), Rev. W. G. Elliot, pastor.

KHJ, Los Angeles, Calif. (402.2), 8-8:30 p. m., Leigh-Land's Artistic cafe orchestra, Jack Cronshaw, leader; 8:30-7, Art Hickman's Elmore hotel concert orchestra, Edward Piparick, director; 7-7:30, organ soloist, Arthur Blakely, organist; 8-11, program, Harold L. Arnold, Inc., arranged by J. Howard Johnson, a welcome to the Shrine host.

KMX, Hollywood, Calif. (336.9), 7-8 p. m., First Presbyterian Church of Hollywood; 8-9, Ambassador hotel concert orchestra, Josef Eisenfeld, director; 9-10:30, program, Valhalla Memorial association; 10, Inna Labovitch, concert violinist.

KPO, San Francisco, Calif. (428.3), 11-12 p. m., Rex Robert L. Jackson; Theodore J. Irwin, organist; 2-3 p. m., Theodore J. Irwin, organist; 6-6:15, States restaurant orchestra; 6:30-7:30, Palace hotel concert orchestra; 8:30, Palace hotel concert orchestra; 8:30-9:30, Select Palm Springs hotel orchestra.

KTCL, Seattle, Wash. (305.9), 7:50-9:15 p. m., First Church of Christ, Scientist.

Mountain Standard Time Stations

6:30, Bellevue Stratford concert orchestra; 7, bedtime stories.

WGBS, New York, N. Y. (315.6), 7:30-8:30 p. m., "Planning Your Summer Fancy Party," Minnie Purbeck; 8:40-9, Uncle George; 9:30-10, Lew Kruger's Aladdin dance orchestra.

WGR, Buffalo, N. Y. (319), 2:30-4:30 p. m., WGR's afternoon music, A. J. Erdman, director; 9-10, musical program, Sidney H. Carlson, baritone, and associates; 10-11, Welch musical program; 11-11:30, suggestive music; 11:30-12, Vincent Lopez's Royal Sailer dance orchestra, Harold Krier, director.

WHAR, Atlantic City, N. J. (275), 7:30 p. m., Seaside hotel trio; 9, Seaside hotel concert orchestra.

WHN, New York, N. Y. (360), 6:50-7 p. m., Palais D'Or orchestra; 7:30-7:45, health talk, Dr. Leitch; 8:05, "Sonata Italiana," E. H. Hunter; 8:45-9:30, Leonard Urban orchestra; 9:30-9:45, talk, H. V. Derouin of Scientific Endocrines Society; 9:45-10:20, Littman's Harmonics orchestra; 9:30-10, Flower Garden entertainment; 11-12, organ recital, Louis's Lecture theater; 11:30-12, Elton Sillman organ and orchestra.

WHP, Philadelphia, Pa. (308.2), 4, Alfred Inman, tenor; 6:05, Benjamin Franklin concert orchestra; 7, Uncle Wally's bedtime stories; talk, "Physiology Needs of School Children," Dr. Ward Brinton.

WIAR, Providence, R. I. (305.9), 8 p. m., Roy Spring concert team; 9, A. & P. Gypsy singing ensemble.

WJZ, New York, N. Y. (454.3), 4-5 p. m., Arthur Stone, pianist; 4:15-4:30, Walter Greenwood, soprano; Bernhard, First Ball's Royal Terrace orchestra; 7-8, 8:30-9, 9:30-10, 10:30-11, 11:30-12, 1:30-2, 2:30-3, 3:30-4, 4:30-5, 5:30-6, 6:30-7, 7:30-8, 8:30-9, 9:30-10, 10:30-11, 11:30-12, Jacques Green, concert director, descriptive orchestra.

WLIT, Philadelphia, Pa. (394.5), 4:30 p. m., Margaret Corner, Mrs. B. F. Marshall; Marcello North, pianist; 7:30, bedtime stories, Dream Land; 8:30, Brooklyn Snuggie club; 10, Annala cafe dance orchestra; 10:30-11, Adele's features, Ambassador theater.

WMO, New York, N. Y. (461.5), 9-9 p. m., popular program; 9:30-10:30, Ernie Golden and his Hotel Metropolitan orchestra; 10:30-11, organ, soprano; Ralph B. Smith, conductor; Palm Springs hotel orchestra.

World News Digest: 9:30-9:40, talk, W. A. Thompson, Radio Digest; 10-11, Melburn Radio Forum.

(Continued on page 10)

Radio Digest

PROGRAMS
Illustrated

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Vol. XIII Saturday, May 30, 1925 No. 8

A New Sensational Circuit

RADIO DIGEST this week presents a revolutionary Radio circuit. This publication has scouted the world in presenting first and exclusive information on the work of three well-known authorities who have been experimenting—independently—on the same identical scheme for improving tuned radio frequency amplification.

Radio Digest wishes to call the attention of its readers to the fact that this hook-up is a real improvement and development in Radio, and not a rearrangement of the parts of some antique hook-up which has been improved mainly by the addition of the name of the man who dug it up from the archives of 1912 or even before then.

That is the policy of this publication—to be first with the latest, and to be sure it is the latest. As for accuracy, well, accuracy is to be expected from every publication, Radio or otherwise.

Pitch in and Help

CONGESTION of the air still remains with us. It will continue to do so until a righteously wrathful public decides to take some action. Evidently that time is almost here, for the campaign against congestion which this publication is waging, is meeting with unexpected success.

Hundreds of newspapers, broadcasting stations and Radio clubs, and thousands of individual listeners are enlisting their help in this campaign. That is good, but it will take all of this help to get a representative vote from two million listeners on the subject. Have you expressed yourself? How about your neighbors with receiving sets? Pitch in and help to clarify the air. It is to your best interests.

Courtesy in Dividing Time

"THIS is WCAE, Pittsburgh, signing off for the night. We hope you get KFL. Good night." Such is the polite farewell of a station which is dividing time with another on the same wave length. WEBH, Edgewater Beach hotel, and WGN, the Tribune, Chicago, are two more station dividing time on the same wave length. They follow a similar courtesy in their sign-offs.

What a splendid way to handle a situation resulting from the large number of stations on the air! From the listener's standpoint such courteous broadcasters immediately rise in one's estimation.

Radio Versus Jazz and Gin

COMES a letter from a mother of eleven children addressed to KOA, Denver station of the General Electric company. "Your broadcasts are helping greatly to bring our children back to normalcy," says she. "They are solving the problem of keeping my family at home."

Radio versus gin, jazz and petting parties presents an interesting sidelight. The home was the original place of entertainment, but today it has competition in the form of automobiles, dance halls, theaters and many other modern means of amusement. The up-to-date methods of diversion are perfectly harmless providing the gin and petting parties are crossed out.

But as a rule the latter accompany the former. The good judgment of youth is not always developed to the stage it should be, and so gin and petting parties hold their sway. Unchaperoned, as modern practice demands, our children are not restrained, but proceed to taste life in its every form. Oftentimes the result is sad.

But now comes Radio as a competitive form of amusement. Children are staying home to listen in. Youth is holding its Radio dancing parties in the home, and is chaperoned by wiser heads.

It is said that for every evil there is a counter in the form of some good. Broadcasting seems to be the counter much needed by the country at this moment.

RADIO INDI-GEST

Somebody's Wrong

Now Armstrong Marconi Flewelling White Was tall and young and dark and slight, Until he'd had an awful fright, Which shriveled him and made him white.

Made him white and old and bent,
Till he looked like the skeleton of a dent.

There'd been an awfully coolish Lent Before he became shriveled and bent,
Which some people said was so terribul celd,
That he shook like the tongue of a mean old scold,
Until he settled like sugar or sand,
That you shake, till it packs, in the palm of your hand.
But that's a tale that's hard to believe,
'Cept, perhaps, on a Halloween eve.

Besides, I can tell the whole of the truth Direct as I got it from Benjamin Booth,
Who claims that the same thing broke his tooth,
And was one of those shortest of Radio waves,
That's so short it's too wriggly for one that believes.

White was so long he was right on its tune,
And it took to him like soup to a spoon,
And wriggled and wriggled, till it shriveled him up
And left him as quick as a flea a dead pup,
'Cause when he shortened he went out o' tune,
Which happened not a bit of a minute too soon.

And it got out so quick when it left poor White,
That it didn't pay attention to where it would light,
And it hit poor innocent Benjamin Booth,
And busted his only good, undecayed tooth,
And that, you can believe, 'case it the whole of the truth.
S XV.

The Onward March of Education

"—With no other form of amusement available, lumberjacks find that isolation in the forest is driving them into listening even to educational programs over the Radio."
C. W. R.

Where the A. T. & T. Dividends Come From

Dear Indl.—Being the program director of the most popular station in the country (I won't name it because each and every one of the column's readers know which one it is), I thought you might like to know the summary of the telegrams for last night's stellar program (they are always stellar):

- "Program coming in fine".....7,859,202
- "Program coming in great".....6,450,982
- "Program excellent".....6,388,347
- "Will you please play.....?".....4,862,111
- "Go to - - - - - You're punk"..... 0

I would like to see the summaries from some of my less popular rival stations.
(Signed) THE PROGRAM DIRECTOR.

The Radio Bug

I've heard of bugs, large and small,
But there's a new variety that beats them all.
They stick around just like a leech,
And listen to the static screech.

Listen—Here's station XYZ,
Now I wonder who that can be?
He sits all hunched up like an owl
And most generally wears a scowl.

I feel sorry for the poor wife,
She lives on—but what a life.
So give yourself a mental bug,
If your husband isn't a Radio Bug.
MARY SKORGA.

From an Inspired Press Agent

or Why Fred Was Disqualified

Disqualified from speaking over Radio KGO because his false teeth made too much noise for the sensitive microphone to ignore, Fred Mantle, San Francisco landscape gardener, is today considering a silencing grid to be used between the plates.

KGO control room operators declared the noise of Fred's mouth crockery sounded like defects in their broadcasting machinery for changing words and music into electrical currents of varying intensities.

Our Own Q. and A. Man; Ask Him

Q.—Do Little and Small drive to the broadcasting studios in a flivver?
A.—No, that was their broken down electric piano act you heard.

—and Other Men

Peggy Hopkins Joyee, one of the theater world's most famous women, was interviewed from Station W—, Wednesday night. She discussed some of the trials and tribulations of being a poor little rich girl, continually followed by detectives and insurance men.

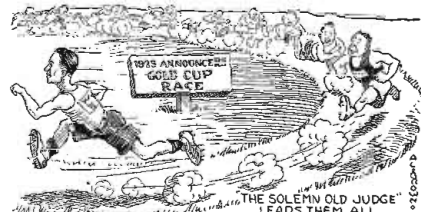
Radio in the Home

"What's that for?" inquired a puzzled wife, seeing her husband engaged in attaching a wire to the water faucet.
"That, my dear, is the earth connection," was the reply.
"But surely," she protested, "there is no earth in that tap. Wouldn't it be better to use one of the flower pots?"
LONDON BOBBY.

Progress in Radio Drama

An outstanding example of the Radio playwright is Charles Hughes of London, who invented the thriller "The Mine Explosion," one of the most realistic plays ever broadcast. He also thought of the dramalet in which a man was heard singing in his bath, which was broadcast from a bathroom in a London hotel.
A. C. B. (LONDON)

In the Week's News



Condensed

By DIELECTRIC

Last year when the survivors of the national oratorical contest declaimed in the city of Washington, it was regarded as an auspicious beginning for arousing American youth to a new interest in matters concerning our national origin. Not only have the school children profited therefrom, but citizens all over the country, whose Radio sets were tuned to the occasion. Again this year we have experienced a thrill of pride in the patent familiarity of boys and girls with the Constitution of the United States, as representative orators spoke before the President, Chief Justice, various government officials and the citizens present and listening in. Another triumph for broadcasting.

When you accustom yourself to ignoring the advertising sections of programs from WEAJ, New York, many of the features of this station will be found excellent entertainment. During the recent Atwater Kent hour, vocalists and instrumentalists of real competence presented a program replete with good musical selections. Who cares whether it is the Glass Brothers' Brass band, National Fruit Vendors' Orange orchestra, Pine Sisters' Catarrhal Wind quintet, or what not, just so long as the music is good?

Seldom indeed is WSB, Atlanta, Ga., tuned in and out again with no addition to the evenings' enjoyment. This station was happy in the choice of the Clark university entertainers, whose concert made a ready appeal to those fortunate in tuning in on time. Just a little less attention to the wired testimonials and more to selecting this class of program and the new station will double its clientele.

The World's Playground Station, WPG, carried the spirit of good fellowship from the Kiwanians, meeting in the Chalfont-Haddon Hall hotel in Atlantic City, to listeners north and south. Certainly, the aimable announcer for the Kiwanians took a flavor of the southland with him to Mike. Powel Evans displayed a voice of rich resonance and a sympathetic rendering of the old song, "Carry Me Back to Ole Virginny."

There is probably no one who has not heard of the U. S. Marine band and enjoyed listening to it playing at the nation's capital. Another organization with official recognition is the U. S. Navy band, to which we are permitted to listen whenever WRC, Washington, can put it on the air. The former carries a greater distinction no doubt, but either will suffice to give any listener a pleasing program of music.

A feature which stands out preeminent in my memory of recent violin performances is the playing of Mr. Robinoff, through Station WOR, Newark, N. J. In the first place, this artist had the advantage of an instrument with a ravishing tone. He was master of the most formidable technical passages, such as the Kreisler arrangement for violin of the Sextet from Lucia, and in addition produced a tone of warmth and virility. It is these unusual features which keep the fan forever listening in hopes of finding more. And the best are becoming more frequently presented.

WHAS, Louisville, Ky., gave us a pleasant surprise with the Asbury College men's glee club, possessing among its members some very good voices. If it is not out of place to suggest it here this particular glee club would add to their laurels through a little closer attention to nuance.

Recent Advances in Tuned R.F. Amplification

Part I—Hartley, Minor and Hazeltine

By Milo Gurney

RADIO, in the first mad rush of its popularity has, of necessity, created strange bed-fellows as is evidenced by the fast growing and not unpopular family of "Dynes" and "Flexys" with which the market has been flooded during the past year, following the introduction of the neutralizing principle of tuned transformer compensation by Professor Hazeltine. It is only regrettable that too many of these offerings did not represent added advancements to the art rather than portray ingenious methods of inserting "losses" into circuits as a means for securing stabilization, with resultant inefficiency. The road to further improvement is not strewn with roses and it is, therefore, the author's purpose in this series of articles to not only attempt to clarify the experimenter's mind through pointing out the pitfalls which should be avoided, but also establish a history of the worth while research work which has been done in this field, together with the present trend of recognized engineering minds.



Milo Gurney

No effort of this character would be of merit that did not also include fundamentals for continued experimentation by the thousands who take pride in constructing circuits representing the latest in Radio receivers and it will, therefore, be my greater pleasure to include with this series two, and probably three, relatively new tuned radio frequency circuits, each combining compensator or neutralizing methods which are improvements and not "lossers."

Tuned radio frequency circuits, properly constructed and correctly wired, represent intensely interesting experimentation, as

inherent in them is the assurance of much greater amplification per stage, greater volume over the total broadcast wave length band, together with a selectivity factor comparable with, if not superior to, any circuit at this stage of the art. We may confidently look forward to the market being provided with some very creditable conceptions for the coming season, not as a result only of recent research, but, rather, as a culmination of nearly fifteen years of engineering in this particular type of Radio receivers.

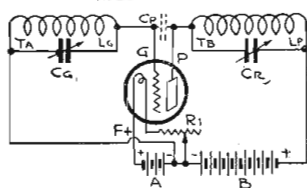


Figure 1

Much of this work has centered around the application of the theory or principle of the well known wheatstone bridge for the securing of compensation or neutralization, and it is the use of this balance bridge principle which will form the basic theory not only of these new and more efficient offerings but also of the circuits which the author will present.

However, before explaining the theory of the wheatstone bridge principle, or presenting circuits using it, a historical survey covering the leading contributions to the science of tuned amplification occurs as important, as, without such a survey to guide us, progressive research would be impossible. In addition, it seems pertinent that the causes of excessive reactive currents and consequent regeneration beyond control should be clearly understood, not because regeneration is harmful, but rather in order that we may intelligently take full advantage of it.

Regeneration is defined as any form of reaction from the plate or output circuit

upon the grid or input circuit of an amplifying tube wherein the alternating current power supplied to the grid is increased. Note particularly that regeneration can only occur when preceded by amplification and, as amplification of the input or grid circuit can only take place within the vacuum tube, it is obvious then that so long as we find it essential to have both input and output circuits comprising inductance and capacity, coupled through the grid and plate elements of the tube, then just that long will regeneration be present at some value and we may as well give up hope of trying to eliminate it. At the same time it is well to realize that, instead of attempting to totally eliminate regeneration, particularly in tuned radio frequency circuits, we should to the contrary use the maximum amount compatible with quality reproduction and our ability to neutralize or compensate its interstage coupling effect.

Figure 1 is a schematic typical of a circuit capable of oscillation and consequent regeneration, representing the total elements in one stage of a standard receiver and comprising in its picturization all the factors common to any type of circuit you may be using or applicable to any other. It is shown primarily to convince that regeneration is ever present while

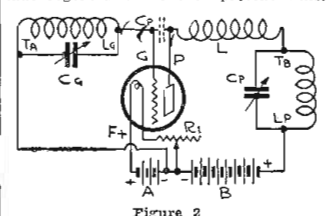


Figure 2

Figure 2 is shown as proof that no change has been made in the fundamental of Figure 1 except that a portion of the plate circuit winding has been reversed, and, in the form shown, is the schematic circuit of the Minor Superdyne.

It is then apparent, that our problem in all tuned radio frequency circuits is the control of oscillation and I want each of my readers to appreciate that the major portion of howling or oscillation troubles occur in the first, or antenna input stage. That is the starting point of all your troubles, therefore give it your first attention. Further realize that all compensating devices must of necessity be only a means of limiting the regeneration occurring between the fixed plate and grid elements of the tubes of the sepa-

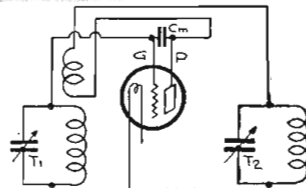


Figure 3

rate stages for each tuning adjustment in the plate circuit; in other words, the ideal compensating device would be one which would change its compensation automatically for each frequency of the plate circuit.

Without question, the majority of regeneration control devices now on the market comprise the introduction of resistance or loss means into either the input or output circuit, or both, so that the energy reaction, or feed back, from the plate to grid will be absorbed. This practice in itself would not be objectionable were it not that their insertion also usually causes distortion and certainly is opposed to the securing of selectivity, hence are not to be considered as other than undesirable makeshifts and totally unworthy of serious consideration since they do not represent any attempt toward securing compensation or feed back control. Hartley (U. S. patent 1,183,875), is credited with the first effort among Amer-

(Continued on page 18)

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For \$20, \$25 or \$30 you can get a Bristol Speaker, and there are others for less. Ask your dealer to send one out to the house. And let us send you folder No. AY-3022; it tells why the Bristol is the horn of tone.

BRISTOL AUDIOPHONE Loud Speaker
THE BRISTOL COMPANY, WATERBURY, CONN.



TUNED R.F. ADVANCES

(Continued from page 17)

ican engineers toward current flow prevention or compensation of its effect (see figure 3) his plan embracing a reversed tickler or bucking magnetic coupling through the coil L₁ in series with the plate inductance. In operation, regeneration, in place of reacting upon the grid circuit, opposes the grid to plate capacity. While Hartley's method has been used with some success by experienced operators, yet, as it involves an attempt to balance capacity against inductance, with a resultant variance in its value of compensation with wave lengths, a constant critical changing of coupling is required which, in a large measure, has curtailed its commercial use except for those obsessed with much patience. This scheme,

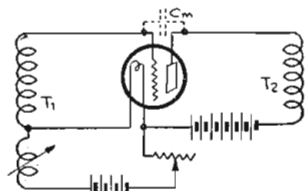


Figure 4

when handled by an experienced operator, has few superiors, tube for tube, in fact but recently a French engineer by the name of Dalet has offered, as his contribution to the advancement of compensated tuned radio frequency amplifiers, an interesting circuit shown schematically in figure 4 which, in effect, is identical with Hartley's conceptions except that the reverse tickler, or bucking magnetic coil, is inserted in series with the minus A battery lead. This is admissible as an improvement as acting upon the low potential rather than the high of the circuit. In this connection I shall present, during this series, a modification of Dalet's idea which may appeal to those interested in research work as worthy of further investigation, it possessing much of experimental interest.

Some question may arise as to whether there is not a close relationship between Hartley's method of compensation and

that of Hazeltine's and this query has been raised very often through confusing the Hartley compensated circuit with that of Rice (U. S. patent 1,134,118). No

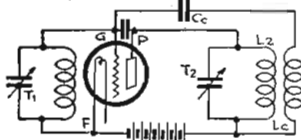


Figure 5

similarity exists between the Hartley and the Hazeltine method, as Hartley clearly defines and indicates that his method of compensation is in the form of a reversed magnetic feed back, while that of Hazeltine varies in that it employs reversed capacity feed, or, in other words while each are reversed feed back schemes, one is magnetic and the other capacitive. There is, however, a marked mirror of sameness between the Rice and Hazeltine methods (see figure 5 and figure 6).

Rice vs. Hazeltine

One will, however, note upon close analysis of figure 6 (Rice) and figure 5 (Hazeltine) a marked variance in the possible total compensation available in the two circuits which materially differentiates them. In the Hazeltine method, structural difficulties in the building of the coils or inductances allow leakage of a magnetic character between the prim-

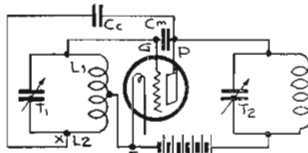


Figure 6

ary and secondary windings, thus preventing in a measure a constant voltage in opposition between the primary and secondary. Hence the neutralization cannot well be independent of the frequency, (Continued on page 20)

UNIFORMITY VITAL IN TRANSFORMERS

Experienced set-builders agree that the trouble with most makes of transformers is lack of uniformity. Thordarsons are the exception—they run absolutely alike, absolutely uniform; always "match up" perfectly; always amplify evenly over the entire musical scale. That is one of the big reasons why leading makers use more Thordarsons than all competitive transformers combined. Partial list below:

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- MALONE LEMON**
- MASTER RADIO**
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The NEW Radio Book



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

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

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

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

For the Man That Bought His Set

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

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

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

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A. B. C. Course in Radio Fundamentals

Chapter X—Electrical Measuring Instruments

By David Penn Moreton

AN AMMETER is an instrument used in measuring the value of an electric current in a circuit in which the ammeter is connected. The operation of all ammeters depends upon some effect produced by the electric current to be measured, such as the heating effect, magnetic effect and chemical effect.

The construction of the instrument is such that the effect produced by the electric current causes a pointer to move over a graduated scale and give the indication which varies in value with the

of metal and for this reason they are known as "thermal" ammeters. Ammeters of this kind are divided into two main groups, the "expansion" and "thermocouple" instruments.

The expansion type makes use of the fact that a piece of wire or strip expands and increases in length when it is heated. The principle of this type of ammeter is illustrated in figure 49. The wire AB carries the current to be measured and it is of a material having sufficient resistance so that it becomes hot when there is a current in it and as a result it increases in length. A small thread T has one end attached to the wire which is being heated near its center, and the other end is attached to the spring S. The thread T passes around the shaft R. The shaft R has a pointer P attached to it which moves over a scale C. Now as the wire AB increases in length due to the heating effect of the current in it, the spring S will pull the thread T toward the right and, since the thread is wound around the shaft R, the shaft R will rotate causing the pointer P to move over the scale C. The construction of the instrument and the marking of the scale may be such that the pointer gives an indication of the exact value of the current in the wire AB.

Principle of "TC" Ammeters

The thermocouple, or "TC" type of ammeters makes use of the fact that when the junction of two dissimilar metals is heated, an electrical pressure is developed. A combination of metals used for this purpose is called a "thermocouple." The electrical pressure produced at the junction depends upon the kind of metals used and in general it varies directly as the temperature of the junction is varied. The principle of the construction of the thermocouple type of ammeter is shown in figure 50. The wire AB carries the current to be measured and there is in contact with this wire a thermocouple composed of the wires C and D. There will be an electrical pressure produced in the thermocouple composed of the wires C and D, due to the heat produced in the wire AB by the current which it carries.

The electric pressure produced by the thermocouple is used in operating an indicating instrument I and causes a pointer to move over a scale giving an indication which is proportional to the heating effect produced by the current in the wire AB. The electrical pressure produced by the thermocouple is a direct electrical pressure and the instrument I responds to the direct current produced by this pressure.

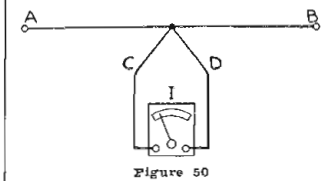


Figure 50

The thermocouple is sometimes mounted in the same containing case with the instrument I, and sometimes is in a separate case. When they are mounted separately the instrument I may be used with a number of different thermocouples and in this way the current range of the instrument I is greatly increased.

Different R. F. Ammeter Scales
In one of the previous installments the relation between the average, maximum, and effective values of an alternating current were given. In speaking of the value of an alternating current the effective value is always understood to be the one referred to. This effective value is equal to the square root of the average of the instantaneous values of the current squared. The heating effect produced in the thermal ammeters described above is proportional to the average of the instantaneous currents squared and the deflection of the pointers is proportional to the square of the effective current.

The scale of the instrument may however be marked to read effective current direct and in such cases the scale divisions are not uniform, being more open at the right end of the scale than at the lower end. Ammeter scales are sometimes marked so that their readings are proportional to the square of the current and such ammeters are called "current-square meters."

The current that a single heating element in a thermal ammeter can take care of is limited to a few amperes and when larger currents are to be measured several heating wires are connected in parallel and arranged cylindrically with respect to each other so that the radio frequency currents will divide equally between them. The effect of the current in a single wire may be used in operating the indicating part of the instrument and the marking of the scale made to read the total current.

D. C. and Low Frequency A. C. Meters
The most common instruments used in measuring direct currents and low frequency alternating currents depend upon the force between a permanent magnet

and a wire carrying a current, or the force between two wires each carrying the current to be measured, or the force upon a piece of soft iron placed in the magnetic field of a coil carrying the current to be measured.

The principle of an instrument depending upon the force between a wire and a permanent magnet is shown in figure 57. A coil C of very fine wire is mounted between the poles of a permanent magnet NS. Two spiral springs PP serve

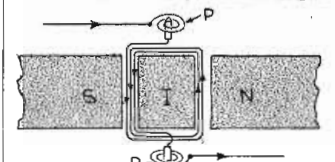


Figure 51

(Continued on page 20)

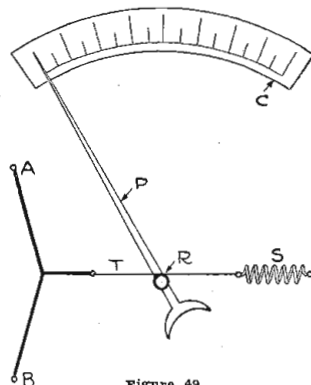


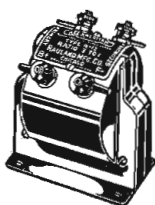
Figure 49

value of the electric current passing through the ammeter, since the effects produced by an electric current are greater with strong current than they are with a weak one. The two effects produced by an electric current that are employed in the construction of practically all ammeters used in Radio work are the heating and the magnetic effect.

Radio Frequency Ammeters

Currents of radio frequency are usually measured by means of instruments which depend upon the heating of a wire or strip

Leadership



Of what importance is it to you as a user of radio transformers, to know that any particular brand, such as ALL-AMERICAN, has held continuously for a number of years the position of *proven leadership in quantity of sales?*

Simply this: that such an achievement is the best possible proof of *continued satisfaction* given to other users of ALL-AMERICANS. It is your assurance of highest quality.

Every All-American transformer has stamped upon it a serial number which identifies the record of its individual test at the factory. The manufacturer stands behind it absolutely provided this serial number is not effaced. *Look for the number,* and for the famous tag with guarantee tag with the inspector's punch marks.



The new Radio Key Book is ready for distribution. It contains a liberal education in modern radio reception and illustrates a number of approved hook-ups. Send 10 cents for it now, coin or stamps.

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E. N. Rauland, President
2640, Coyne Street, CHICAGO, ILL.

ALL-AMERICAN

Largest Selling Transformers in the World

Lincoln Collapsible LOOP AERIALS



"Recommend It!"
SAYS R. W. COTTON
Designer of Cotton "Super-Het"

R. W. Cotton, famed designer of the Cotton Superheterodyne, wrote us March 10, 1925, as follows:

Gentlemen:
I had the pleasure last night of trying out one of your Center-Tapped Loops in conjunction with the "Cotton" Super. The results obtained were very satisfactory and for the amount of money represented by your Loop I do not know where in today's market the public can obtain equal value. Your Loop functions properly with my set and I recommend it for that purpose with my sanction.
Sincerely yours,
R. W. COTTON.

Lincoln Center-Tapped Loop \$6.50

For any set employing radio frequency amplification. Particularly adapted for "Super-hets" requiring a center tap.

Lincoln 4-Point Tapped Loop \$8.00

The only moderate priced Loop of this type on the market. Plus for all types of "Super-hets"—and neutrodyne and tuned radio frequency sets, where an outside Aerial is impractical. For the requirements of any set where it is desired to vary the inductance of the loop.

BUY A LINCOLN LOOP

Sold by good dealers everywhere. If yours cannot supply you order direct giving your dealer's name.

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Owensboro (Dept. A) Kentucky

TUNED R.F. ADVANCES

(Continued from page 18)

therefore, as the neutralization is progressive it is likewise obvious that over compensation or neutralization is easily possible.

In the Rice method, figure 6, such neutralization is limited to only absolute compensation, and not on into over compensation, and it is, primarily, the limited compensation possibilities of one as against the over compensation ability of the other in which there is a possible variance in these two most interesting studies, or examples, of opposed phase methods for the securing of neutralization. Thus the outstanding work and circuits comprising the research history up to around 1921 may be summed up in the efforts of Rice, Hartley and Hazeltine. Though Heising, Nichols, and Cowper, an Englishman, have secured a measure of success in this field, their results are not being tabulated as a sufficient history has been given to point the progress made up to approximately the year 1921.

(Editor's Note.—The circuits and regeneration control devices of some of the best known sets on the market are taken up next week. Of greater importance, however, is Mr. Gurney's discussion of coil turn ratios, another means of preventing oscillation.)

OLD STORY SHOWS RADIO'S PROGRESS

THE immenseness of the strides made by Radio within the last few years are more or less unnoticed until attention is called to the subject. The following article is such a reminder. It is an excerpt from a story in the Journal of the American Institute of Electrical Engineers published in July, 1920.

"Music can be transmitted by wireless in the same manner as speech or code signals. As an incidental result of research work on Radio telephony at the Bureau of Standards it has been shown that music can be transmitted by wireless without loss of quality.

"The possibilities in this direction are great. With the aid of an ordinary telephone mouth piece as a transmitter, phonograph music has been sent out in an experimental concert. The music was heard by distant stations."

Notice the word "incidental" in the first paragraph of the quotation. Even at that time the most prophetic engineers had no conception of the Radio of today. It is the old story of the first steamboat, railroad engine or airplane on a greater scale.

In 1924-25 Radio sales are expected to read \$370,000,000.

Heavyside Layer and the Causes of Fading Now Being Tested in France

PARIS.—M. M. Lardry (SAO), a French amateur and scientist, has been conducting important studies of fading and variable reception effects for many months, especially in connection with blind spots and the weakening of signals at sundown. His experiments in transmission on a 200-meter wave length are especially interesting in view of their connection with the theory of the Heavyside Layer.

The transmission set of Mr. Lardry is located near Le Mans, in a depression with a diameter of 500 meters and a depth of 30 meters below the surrounding plateau. There is an opening in the plateau to the south, so that the set is in the center of a horseshoe. When Mr. Lardry sent out messages, amateurs at short distances (40 to 60 miles) reported that nothing could be heard, with the exception of amateurs located in the direction of the opening of the horseshoe, who heard perfectly. Amateurs located at long distances in every direction picked up the messages and reported excellent reception.

These experiments seem to confirm the Heavyside theory, which Mr. Lardry states is the only hypothesis worth considering. He believes, however, that the Heavyside Layer is not a geometric surface reflecting the waves geometrically. The Heavyside Layer is tumultuous, Mr. Lardry believes, refracting Radio waves at various angles. It is likewise a "volume" and not a surface, and absorbs part of the Radio waves.

In this manner the waves which travel directly along the soil are reinforced by reflected Radio waves with varying intensities, while meteorological perturbations near the receiving apparatus result in the "fading" of all waves, whether direct or reflected by the Heavyside Layer.

The French scientist lays a good deal of trouble at the door of the weather.

Burn Tubes Low

In using oxide filament tubes, their filaments should be burned at as low a temperature as possible, even though it may be lower than the normal current rating as stated by the manufacturer.

Proper Set Operation Depends on Ground

To insure a proper operation of any receiver it must be connected to a good ground in a proper manner. In the city the best ground is a water pipe. However, the connection should be made as near as possible to the point where the water pipe enters the house. If the water meter is located in the house the connection to the set should be made on the far side of the meter. A steam or water heating system is usually connected to the water supply, and in this case may serve as a ground. However, it is better to go direct to the water system, as just mentioned. The gas pipe also may be used for a ground. In this case make your connection as near as possible to the point where the pipe enters the building. If several systems are available try out one after another and use the one giving the best results.

Well Used for Ground

Where a piping system is not available, a ground may be obtained by dropping a copper plate to the bottom of a well, letting the plate rest on the clay bottom. Do not attempt to use a cistern, for in ordinary cases the water is too free from salts to make a good conductor. A rod may be driven into moist soil or a plate buried in moist earth. A ground of this type is usually very unsatisfactory, because you do not penetrate the earth far enough and sufficient contact is not made with the water. Very frequently such grounds become absolutely worthless in dry weather.

In case you have not a good pipe system on which to make your ground connection, probably the best results will be obtained from a counterpoise system. This is really a wire ground, and it is constructed under the aerial. Stretch wires parallel to your aerial, either on the ground or a few feet above the ground, or buried in a trench. A wire stretching a few feet above the ground may give the best results, and if it can be erected in this position without being in the way, it is highly recommended.

Making Proper Connections

After a proper ground has been obtained be sure that a proper connection is made to the wire running to the Radio set. If the ground is a pipe, the pipe must be scraped absolutely clean. If possible, empty the water from the pipe and solder to it. If this cannot be done use a ground clamp and fasten it tightly to the brightened metal. If a plate is dropped into a well, solder the wire to the plate first. If a counterpoise or fence is used, the connection may be soldered very easily, or in the case of the counterpoise a continuous wire may be run into the house without break.

and many of his intensely interesting experiments seem to bear him out in this. Before he is willing to draw general conclusions, however, he wishes to continue over a long period, and with expert assistance the work he has initiated, and he believes a special transmission set must be devised to furnish assistance to the researchers.

The Reader's View

Reading Telegrams Out of Order

The article from your issue of April 11 is most commendable. The article is as follows:

I have no doubt that Station WTAM, Willard Battery, Cleveland, has a large regular audience tuned to hear their broadcasting of the symphonic ensemble concerts, which are indeed excellent. However, it may be asserted with equal assurance that reading telegrams by the score tends to disrupt an otherwise well-balanced program and starts "dialing." This station is not the sole offender—by no means—but it is marked for the reason of its being so interesting in all other respects.

I subscribed for Radio Digest on account of an article critiquing announcers who failed to announce—a criticism which made a great improvement—and now if you will hammer the telegram readers you will render further service to the listeners.

Who wants to listen to a lot of canned telegrams like, "you are coming in fine," etc., etc., signed by Mr. and Mrs. Smith of Squeedunk, and by Mr. and Mrs. Jones of Hamville. Not me, I assure you, so as soon as they start the telegram reading I turn my dials elsewhere. Keep up the good work.—Edward S. Lewis, St. Louis, Mo.

Use number 14 copper wire in a hook-up when you have no bus bar. Copper wire will give as good or better results, but it is more likely to tarnish.

A. B. C. RADIO COURSE

(Continued from page 19)

the double purpose of conducting the current to the winding of the coil and controlling the position of the coil. A cylindrical piece of soft iron I is mounted between the poles N and S and this serves as a good magnetic path thus increasing the strength of the magnetic field in the air gaps where the sides of the coil are located. Now let us assume that there is a current established in the coil in the direction indicated by the arrow heads on the wire. The part of the coil near the N pole of the magnet has a force acting on it which tends to move the coil toward the observer or away from the paper. Likewise the part of the coil near the S pole of the magnet has a force acting on it which tends to move the coil away from the observer.

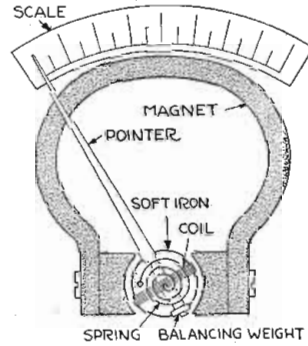


Figure 52

The direction of these forces in relation to the direction of the current and the direction of the magnetic field may be determined by means of the left hand or motor rule. Place the left hand in such a position that the forefinger points in the direction of the magnetic field and the middle finger in the direction of the current in the wire. Then the thumb will point in the direction of the force acting on the wire. The forefinger, middle finger, and thumb must be at right angles to each other.

As a result of these two forces acting and since the coil is mounted between bearings at the center of its ends, there will be a tendency for the coil to rotate. The coil is held in its zero position by the action of the two springs and these springs oppose any rotation of the coil. There is a certain position of the coil for each value of current where the force due to the current and the force due to the springs balance each other. The movement of the coil in the magnetic field may be indicated by a pointer attached to the coil as shown diagrammatically in figure 52 and the scale marked to read directly in amperes.

Instruments of this kind can be made very delicate and will respond to very small currents. Sometimes the scale is graduated in thousandths and even in millionths of an ampere and in such cases the instrument is called a "milliammeter" (reading the thousandths of an ampere) and a "microammeter" (reading in millionths), respectively.

For very fine measurements the coil is suspended by a long fine strap at the top and bottom which replace the springs and pivot bearings. A small mirror is usually attached to the coil and the deflection is measured by a reflected beam of light which moves over a graduated scale set up in front of the instrument. An instrument of this kind is called a moving coil galvanometer.

The direction in which the moving system is deflected depends upon the direction of the current and for this reason the instrument cannot be used in measuring alternating currents. If a fluctuating or pulsating direct current be sent through the instrument it will indicate the average value of the current.

(Editor's Note.—Professor Moreton's next article will explain instruments of the electro-dynamometer type and magnetic vane type and wavemeters.)

Deaf in Church Hear

With a single change in the ordinary receiving set one minister gets his message to deaf persons in the congregation. He placed an extra one-way jack on the panel and connected it with the primary of the first amplifier. This is used for the loud speaker horn, which, in this case, is used as a transmitter. The loud speaker is placed near where he speaks and lines are run to the headphones for the deaf. A regular transmitter can be used in place of the loud speaker and the results will be better.

Good Radio Reception All Summer WITH THE KANE ANTENNAE

And the Proof?

Read This Letter

Dear Sir:— 215 S. Center Street, Casper, Wyoming, April 27, 1925.
Some time ago I received one of your Antennae for a Super Het, and have tried it out both on a Super and on a set using a ground (I built a Counterpoise according to your plans), and I can truthfully say it does all you claim, and more, too.

I am using this at my place of business in the heart of the down town district, where it has been almost impossible to get reception due to the terrific power leakage, and even a Radiola Super could not cut it out.

I am getting better reception here than I do at my home, where there is no interference to contend with.

You cannot realize what it means to get good reception now, as I have never been able to make any kind of demonstration before.

Thanking you again, and assuring you that I am a big booster for the Kane Antennae, I am, (Signed) Very truly yours, Watson, Radio Shop, A. M. Watson.

See for Yourself Just What the Kane Antennae Is

We will sell you working drawing with instructions for erecting this wonderful Antennae for a dollar bill. If, after looking over the drawing, you decide you would rather have a factory-built Antennae than build one yourself, we will take back the drawing and allow you full purchase price on an order for an Antennae.

The Special Kane Antennae for Radiola Super-Hets..... \$ 6.50
The Regular Kane Antennae for all other sets that use a ground connection..... 13.00

Working Drawing with Instructions for Erecting, \$1.00 (Stamps Not Accepted)

Postpaid to any part of the United States or sent C.O.D. when 25% of price accompanies order.

THE KANE ANTENNAE COMPANY, (Dept. C), Aberdeen, Washington

pep up your set with good tubes

SOME radio fans don't expect much "pep" from their portable sets. "Oh well, only using the small tubes," they explain. But they have quickly revised their ideas when they switched to MAGNATRONS DC-199 tubes.

You'll never realize how important tubes really are until you adopt MAGNATRONS. Your dealer has them!

CONNWEY ELECTRIC LABORATORIES
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MAGNATRONS

Simplifying Operation with Switches

Current Shift for Set, Battery and Receiver

The old method of connecting wires from the batteries to the set has been eliminated to some extent, but there still remains the task of disconnecting wires when the battery is put on charge. The

WORKSHOP KINKS EARN A DOLLAR—

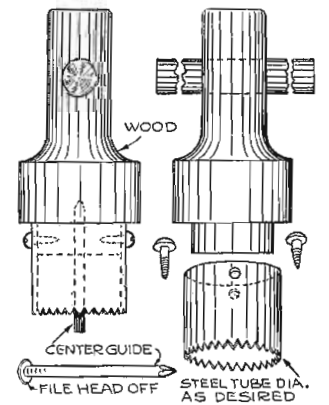
THERE are many little kinks worked out at home that would aid your fellow Radio worker if only he knew about them. There are new hook-ups, new ways of making parts and various unique ways of operating sets that are discovered every day. Radio Digest is very much interested in obtaining such material.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

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

only way to get around this difficulty is with the use of double throw switches. The illustration herewith shows a system of switches with a wiring diagram for connecting up the batteries to the charger and set so that all connections may remain intact. To change the current from the battery to the set and from the battery to the charger only requires the throwing of two double throw switches.—Chas. R. Hazel, Chakekoi, Pa.

Panel Hole Cutting Tool

The common practice used in the cutting of large round holes in panel material is the drilling of a circular series of small holes and then cutting out the disk. This last operation is quite a problem and very often results in the splitting of the panel.

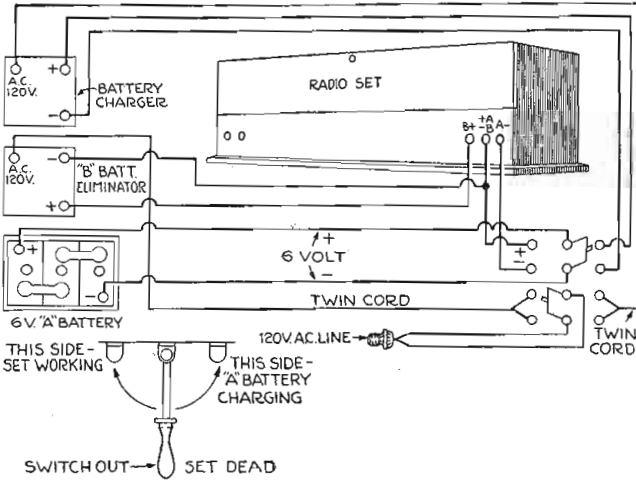


The tool illustrated is as simple in construction as is possible and requires very little time in constructing it. Although it is not intended to be used continuously, it will meet all requirements

ask "are they genuine Radiotrons?"



CIRCUIT USED FOR CHANGING CURRENT



of the home mechanic in a satisfactory manner who has work of this nature. The principle part of the tool is turned from hard wood to the shape shown, with a shoulder on its lower end having the same diameter as the inside diameter of the tube used to accommodate it. A steel tube having the same outside diameter as the desired hole is secured and saw-tooth shaped teeth are filed on its lower end. This is then secured in place to the wooden piece with screws. A piece of nail is then inserted centrally in place in the wooden piece to act as a guide.

To use the tool, a hole having the same diameter as the nail is drilled through the panel in the center of the desired hole, the tool is placed in a bit brace and the nail inserted in the guide hole. Turn the brace in the usual manner.—Wm. J. Edmonds, Jr.—Whitehall, N. Y.

Test for Transformers

Occasionally it will be found that audio-amplifying transformers are defective either on account of a burnt-out winding or a short between one of the windings and the frame of the transformer. This can be determined very easily by means of a very weak dry cell and an ordinary pair of head receivers. Connect the battery and receivers in series to the posts of one winding. If there is a sharp click in the receivers, the winding is not burnt out. The same process is repeated with the other winding. Now test each binding post and the frame of the transformer. If there is a sharp click, there is a short. If there is no click or a very small one, the transformer is O. K.

Insulation Aids

Wire insulation is a covering of cotton, silk or rubber, used to protect the wire from coming into contact with exposed parts of other live wires.

Buy Tubes by Name

WD-11 Radiotron

Where bare wires or metal parts carrying current are used, they are mounted on or protected by other insulating material, such as hard rubber, bakelite, fiber or porcelain, the latter being used principally for aerial insulation.

When wires are touching the building, as an aerial lead-in, they must be protected with additional insulation which is waterproof. This kind of wire is known as "weatherproof" and is used for exposed work.

It is not necessary to use insulated wire for the aerial because it is protected from current escapes by the porcelain or glass insulators which support it at each end. It is only where it enters the building that insulated wire, or better, a porcelain tube is used.

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Great collection of Radio Information. Lessons for the beginner. Instruction on how to build and operate the standard reliable sets.

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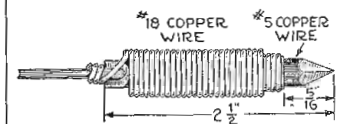
Small Soldering Iron

As I needed a small soldering iron for soldering Radio connections, I hunted for "junk" over for a bit of copper rod 3/8 inch in diameter, or thereabout, but could not find anything within a mile of it.

The only thing offering any possibilities whatsoever, was a coil of number 5 copper wire, altogether too small a diameter for the purpose, but the only possibility available. A small iron I must have, and "necessity is the mother of invention."

A bit of this number 5 wire, 2 1/2 inches long was filed to a soldering tip at one end, and the other end affixed to a wire shank and handle, "Just like it was a real soldering iron."

The number 5 wire was, of course, too small in diameter to retain heat at all satisfactorily, and here's where the "invention" came in.



With some bare number 18 copper wire, starting at the shank end of the copied bit, I wrapped a tight coil around the copper to within about 1/4 inch of the tip, a second coil backward over the first to the start, a third coil down again over the second, but not quite so far as the first, then back over the whole with a fourth coil to the starting point, where the end of the number 18 wire was secured by wrapping a few turns around the shank.

By this building on of extra metal, the heat retaining quality of the tool was increased to a point where it gave good satisfaction; probably not quite as great as if it were solid metal, but sufficient so it worked satisfactorily.—Chas. A. Pease, Monrovia, Cal.

Refinishing Metal Horn

To take tiny sound out of a metal loud speaker horn, spatter it slowly with a mixture and paraffin and salt to which a little vinegar has been added to make it adhesive. When the horn cools, apply several coats of flat black paint.

GROSLEY

Model 50

\$14.50

The Little Giant of Radio

Distance

on the phones—with certainty and regularity—on the Crosley one-tube 50. The radio which told the world that the MacMillan North Pole expedition was safe and sound. The radio that kept communication open to Leonard Weeks at Minot, N. D., when all other receivers failed.

There is nothing better than the Crosley 50 for the radio beginner.

There is nothing to excel it in value; unless it be the larger Crosley sets.

Stations always come in at the same place.

For sale by good dealers everywhere. Other models priced from the two tube 51, at \$18.50, to the Tridyn Special with sloping panel, at \$65. All Crosley Radios are licensed under Armstrong Regenerative U. S. Patent No. 1,113,149. Prices quoted are without accessories.

Prices West of Rockies—Add 10%
Write for Complete Catalog

The Crosley Radio Corporation
Powel Crosley, Jr., President
5495 Sasparas St. Cincinnati, Ohio
Crosley own and operates Broadcasting Station WLV

Questions and Answers

Power Line Interference

(13726) RMR, Jamestown, N. D.
How can we locate and eliminate interference which we think is caused by a 2300 volt power line?

A.—To eliminate this interference it must be located first. It can be located by means of a loop receiver. The receiver should consist of a three circuit low loss tuner made to tune to wave lengths below 200 meters. The loop should be connected to the primary directly, same as an antenna and a ground are connected. The whole receiver except the loop, should be shielded with sheet iron. Galvanized iron is OK. The reason for this is to shield it both against electromagnetic and electrostatic currents. The batteries should either be enclosed within the shielded box or else the leads should be enclosed in a woven copper braid. The phone cord should be shielded also with a braid. All of the shield should be connected to a ground in some way. If it is to be used in a car then connect it to the ear frame. It can now be seen that if any signals are received they will come through the loop only and not through the wiring and the coil in the set. When this is finished the set should be placed on a car and the car can follow power lines around until the interference is located. You should use both the maximum and the minimum points to locate this interference and check one against another by approaching the interference from different angles. When the trouble is located it can be fixed right there. It may be a defective wire or a leaky insulator. Often the trouble can not be seen. Often it is necessary to tear down a whole telephone pole and put up a new one.

Loop on a Neutrodyne

(13297) CAB, Cumberland, Md.
I have a neutrodyne which is arranged for use with a loop. At the present I do not secure very good results with it. Often by moving the loop I can produce squeals in the set. The loop, which does not have very much directional effect on stations close by, with other sets, acts different with the neutrodyne. I can tune in a nearby station and then, by moving the loop, loose it. Then by retuning the set get the station back again. Would you advise the use of an outside antenna instead of the loop? How long should the outside antenna be?

A.—We would advise the use of an outside aerial in place of the loop. The antenna should be about 75 feet long. The reason the loop is not a success with the neutrodyne is because it tends to interact with the neutroformers in the set, thus upsetting the effect of the neutralizers. If the set was shielded well, both panel and cabinet, you could probably use a loop with it.

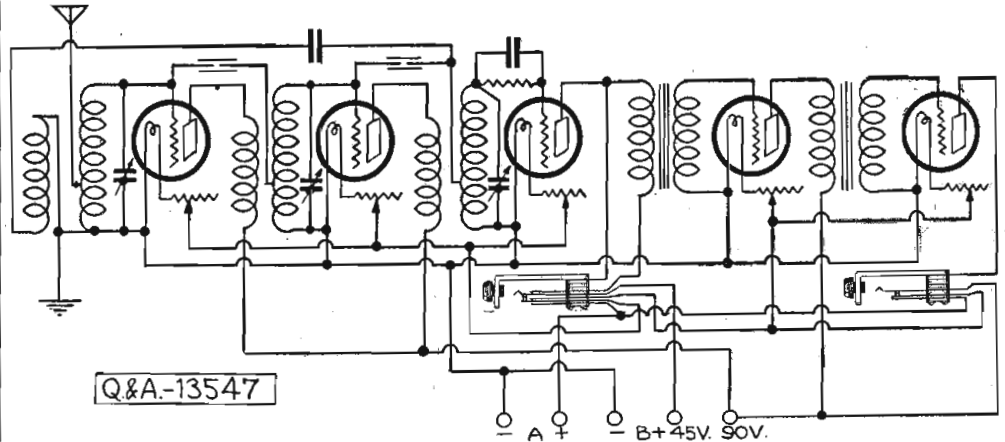
The Law of Secrecy

(13723) LL, Chicago, Ill.
What is the law of secrecy in regard to radio messages?

A.—The law of secrecy reads as follows: "No operator nor operators, nor person or persons, having the knowledge of any message transmitted or received at any station or stations shall publish nor divulge any part of the same message except to person or persons to whom the same may be addressed or to their authorized agents, except when forced to do so by a court of competent jurisdiction." This means that if you hear a conversation on the air unless it is broadcast or else transmitted to you directly you must keep it secret. If you hear some amateurs conversing over the air you cannot legally tell your neighbor or friend about it. If you do you may go to jail for a year or pay a fine of \$2,000.00, or both at the discretion of the court.

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Q&A-13547

Neutrodyne Hookup

(13547) FHJ, Richmond, Va.
Asks for a neutrodyne hookup with filament control on the jacks and with the "X" wire added.
A.—The hookup appears on this page.

Howling in a Set

(13435) JON, Draper, N. C.
I have trouble in controlling my set. When I tune in it howls and squeals. Often there is a rumbling noise especially when I tune a station in very loudly. What can be the matter?

A.—We could better advise you on your trouble if you sent us a diagram of your set indicating the rotary and stationary plates. It is very possible that these are connected wrong. Also it may be due to a microphonic noise. If you do not have cushion sockets try lifting the loudspeaker off the table. Often the presence of the loudspeaker on the same table as the set causes rumbling noises. Your transformers may be unshielded and placed too close together, so there is another chance for noises to occur.

Canadian Stations Can Be Heard

In your December 29 issue I saw a letter from—on page 30. He says that in Kitchener they seldom hear Canadian stations. Well we are about 20 miles west of Kitchener and on a single tube set I have heard clearly and distinctly stations CKOC, Hamilton; CFON, Hamilton; CNRO, CFCO, CHNC, Toronto; CKAC, CHYC, CNRM, Montreal; CNRO, CKOC, Ottawa; CFKC, Thorold; CNRA, Moncton, N. B.; CNRW, CKY, Winnipeg.

There has not been a program sent out from these stations in the last three months but what I have heard on my own set that fully deserved an applause card and their programs are equal to those sent out by the majority of American stations.—Anthony S. Mendell, Elora, Ontario, Canada.

Broadcast Tuner

(13722) FF, Magnolia Springs, Ala.
I have a tuner which seems to work O K in every way except that it does not work above 30 degrees on the condenser. I get all of the broadcasting stations except those on the lower waves. The secondary of the tuner consists of 95 turns

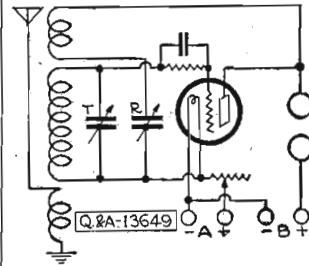
of number 26 wire on a 3-inch tube. What is the matter with the set?

A.—The trouble with your set is that you have too many turns on your secondary. It is no wonder that you do not get the lower wave stations. Reduce the number of turns on your tuner till you get stations such as KYW or KSD on about 95 on your dial. You will then have no trouble getting the stations on the lower waves.

Weagent "K" Circuit

(13649) JRF, North Braddock, Pa.
Asks for hookup of the Weagent "X" circuit.

A.—The hookup appears on this page. Tuning of this set is accomplished by means of condenser T. The regeneration is controlled by condenser R. The tickler



Q&A-13649

coil is fixed a small distance away from the secondary. The regeneration control is independent of the tuning control and can be controlled without changing the tuning of condenser T.

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

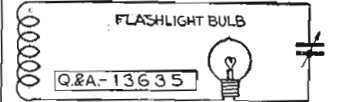
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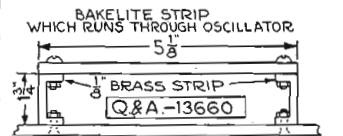
Wavemeter Hookup

(13635) TEL, E. Rutherford, N. J.
Asks for the hookup of a simple wavemeter to be constructed at home.
A.—The hookup appears on this page. The coil for the broadcast band consists



of about 65 turns of number 20 or 18 wire wound on a 2 1/2-inch tube. The variable condenser is of .0055 mf. capacity. The lamp is a small flashlight bulb.

Mounting the Low Loss Oscillator
(13660) SEH, Detroit, Mich.
Please give me the details for mounting the low loss oscillator for use in the four filter super-het.



A.—The drawing on this page shows the method for accomplishing this. The U shaped pieces are either brass or copper. The drawing should be turned 90 degrees to the left as this is secured to front panel.

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

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The purpose of the expedition is the study and photographic charting of this unknown area—and—new tests in radio transmission and reception of unparalleled importance. The section to be explored has never been heard from by radio. Communication will of necessity be *daylight* communication, for in this area the days are six months long.

On an expedition representing so great a risk, both in capital and human life, only the *best* in radio equipment can possibly command a place. Once more, therefore, MacMillan chooses ZENITH exclusively, both for his ships and for the three great planes flying across uncharted seas of ice.

Thus, while the world awaits reports from this greatest ex-



Super-Zenith IX

pedition of modern times, it is worth remembering that the only way these reports can possibly be transmitted is by Zenith radio.

Never in all your life, it is safe to say, will radio apparatus require such *outstanding* performance as MacMillan requires of ZENITH in the Arctic. But can you imagine a more powerful point than the fact that Zenith receiving sets can *deliver* such performance, any time they're called upon to do so?

Owners of Zenith radio receiving sets have an assured success in radio reception—dependable and sure.

Handled only by selected dealers who give you service. We give the Zenith agency franchise only to dealers who will give you service AFTER THE RADIO IS SOLD. When you buy a ZENITH

we are not through. Our exclusive dealer's serviceman will call once a week or oftener if you want him. This costs you nothing. In other words, Zenith dealers have done your shopping for you.

Costs More—But Does More

THE complete Zenith line ranges in price from \$100 to \$475. With either Zenith 3R or Zenith 4R, satisfactory reception over distances of 2,000 to 3,000 miles is readily accomplished, using any ordinary loud speaker. Models 3R and 4R licensed under Armstrong U. S. Patent No. 1,113,149. They are NON-RADIATING.

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SUPER-ZENITH VII—Six tubes—2 stages tuned frequency amplification—detector and 3 stages audio frequency amplification. Installed in a beautifully finished cabinet of solid mahogany—14 1/2 inches long, 16 3/4 inches wide, 10 1/2 inches high. Compartments at either end for dry batteries. Price (exclusive of tubes and batteries) **\$240**

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