

Radio Digest

EVERY WEEK

Illustrated

TEN CENTS

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R. D. P. Co. Inc.

SATURDAY, NOVEMBER 10, 1923

No. 5

OPERA SEASON STARTS

1000-WATT POWER NOW USED AT WBZ

SPRINGFIELD PLANT INHERITS OLD VOICE OF WJZ

Studio and Equipment Rivals Best in Country—Use Old WBZ Set for Telegraph

SPRINGFIELD, MASS.—Recent additions to the Radio equipment at the Westinghouse station here, WBZ, have made it one of the best 1000-watt stations in the country. The Radio room rivals the best and provides ample space for the operators, while at the same time it makes the equipment easily accessible.

Chief Operator H. E. Hiller was formerly Announcer OHN of Station WJZ at Newark. He is well acquainted with the transmitter, which formerly was the "voice" of WJZ. The transmitting set consists of four 250-watt oscillator and five 250-watt modulator tubes. This is the main part of the

TELLS BEETHOVEN'S GENIUS IN RECITAL

Walter Damrosch, Famous Symphony Conductor, Delivers Lecture from WEA F

NEW YORK.—Walter Damrosch, the famous conductor of the New York Symphony Orchestra and one of the greatest symphony orchestra leaders in the world, broadcast a lecture recital through Station WEA F recently. The recital was picked up by microphones placed in Carnegie Hall here. It was Mr. Damrosch's first appearance before any Radio audience, and was appreciated greatly as indicated by the many letters from listeners in.

Mr. Damrosch's recital, in which he played the piano, was on the subject of Beethoven. It was given in order to satisfy the tremendous interest which has been stimulated in the Beethoven Cycle to be given at Carnegie Hall this season by the New York Symphony Orchestra, with Mr. Damrosch conducting.

The subject of Mr. Damrosch's lecture was Beethoven's First Symphony and the Eroica or Third Symphony.

'LUCIA' FIRST ON AIR FROM STATION KYW

Music Lovers Welcome Tidings—Chicago Station Prepares for Big Feature

November 10 Is Date Set

Will Give Two Operas Each Week—Synopsis between Acts—Metropolitan Refuses

CHICAGO.—Grand Opera on the air again! Music lovers all over the country welcome the news that KYW, Westinghouse station here, will resume its most popular feature on the evening of November 10 with the opera "Lucia di Lammermoor," sung by the Chicago Civic Opera Company at the Auditorium Theater, and picked up there by the Radio microphones.

For two years already KYW, the pioneer opera broadcaster, has enjoyed a tremendous success with its broadcasting of several performances each week of the civic opera during its season, and the announcement that the Chicago station will again play its part in promoting an appreciation of the better things musical, is hailed

(Continued on page 2)



Judge Talks on World Court

SCHENECTADY, N. Y.—John Bassett Moore, judge of the Permanent Court of International Justice at The Hague, addressed the Radio audience of Station WGY here, the General Electric Company, recently on the subject of the international court and some illusions concerning it. Judge Moore's address was delivered at a session of the fifty-ninth convocation of the University of the State of New York, held at Chancellor's Hall, Albany, New York.

Opera stars in the premier opera broadcast this season, "Lucia Di Lammermoor," by the Chicago Civic Opera, and on the air Saturday, November 10, at 8 p. m., Central time. Left to right they are: Jose Mojica as "Lord Arthur Bucklaw"; Florence Macbeth, who sings the role of "Lucia"; Giacomo Rimini as "Lord Henry Ashton"; and Elizabeth Kerr, who will sing the role of "Alice"

transmitting station and is the equipment that carries the voice and music into the air.

Old WBZ Set for Telegraph

The apparatus used for broadcasting at WBZ before the WJZ set was installed has a rating of 500 watts and at the present time is used for Radiotelegraph purposes. The telegraph service is maintained between KDKA at East Pittsburgh and WBZ for inter-plant communication.

An addition to the station is the line amplifying equipment for wire lines from the downtown WBZ studio, the Springfield Auditorium and local churches.

A modulation meter and control rheostat has also been added so that the operator can listen to the programs and gauge the modulation.

UNITED CIGAR STORES TAKE UP AIRPHONES

NEW YORK.—The United Cigar Company have entered the Radio field, at least in this city, with five of their stores stocked with a representative stock. Harold Bergman, in charge of Radio sales for the company, states that, according to present plans, Radio equipment will eventually be stocked in Philadelphia and Chicago stores.

BAR GOES UP ON COUPONS NOV. 24

COLDER WEATHER CLOSES REWARD OFFER

All Letters Must Reach Digest Office Before December 1 to Be Eligible

SPECIAL REWARD OFFER

Coupon Number 24

This Special Reward Coupon appears each issue in Radio Digest until November 24. When sent in, accompanied by necessary remittance, according to the rules governing same, apparatus can be secured. See rules of offer below.

Save Me—I Am Valuable

The Special Reward Offer will be discontinued for the present season with the publication of Coupon Number 26 in the issue of November 24. This action has been deemed necessary as a result of the increased rush in business coming with the colder (and more favorable for Radio) weather.

All Radiophans contemplating taking advantage of the special offer must do so before December 1. All letters containing coupons and remittances for parts must reach the office of Radio Digest on or before that date. Such letters arriving after December 1 will be returned to the writer.

Lack of space requires the omission of the list of Radio parts obtainable. See issue of October 27 or November 3 for this list. One change, however, is to be noted. Articles in Class H must be accompanied by sixteen consecutively numbered coupons and \$3.40, instead of \$3.00 as given previously in the list.

Readers contemplating taking advantage of the special offer must remember that the coupons turned in for any item must be numbered consecutively, as for example, 16, 17, 18 and 19, or 18, 19, 20, 21, 22 and 23. The number of coupons necessary and the cash remittance, of course, depend on the item sought by the reader. There is no limit to the number of series turned in by any one reader.

Another point to be remembered by readers taking advantage of the offer is that checks and money orders will be accepted, but no cash or postage stamps.

OPERA SEASON STARTS

(Continued from page 1)

with delight by countless listeners in. The opera season opens on Thursday night, November 8, but the first performance to be microphoned will be the famous score of Gaetano Donizetti, "Lucia."

KYW to Give Synopses of Acts

While the opera performance will not begin until 8 p. m., Central Standard Time, Station KYW will come on the air about fifteen minutes earlier, at 7:45 p. m. Announcer A. W. "Sen" Kaney, famous for his clear enunciation and expression, will then give a short history of the opera to be broadcast, together with a synopsis of the first act. Between acts he will give the synopsis of the act to follow.

The synopses for all the operas to go on the air are being prepared and written by Mrs. George B. Foster, prominent in Chicago society. Mr. Kaney will do the opera announcing for the entire season.

Preceding the first opera broadcast, on November 9, KYW will devote a part of its evening program to a talk by Mr. Kaney on "How Grand Opera Broadcasting Is Done."

Cast of "Lucia"

The principals who will sing Donizetti's beautiful score and their rôles are: Giacomo Rimini, baritone, as "Lord Henry Ashton"; Florence Macbeth, soprano, as "Lucia"; Giulio Crimi, tenor, as "Sir Edgar of Ravenswood"; Jose Mojica, tenor, as "Lord Arthur Bucklaw"; Elizabeth Kerr, mezzo-soprano, as "Alice," the companion to Lucia; Virgilio Lazzari, tenor, as "Raymond"; and Lodovico Oliviero, tenor, as "Norman," captain of the guard at Ravenswood. Pietro Cimini will conduct.

All of the stars, with the exception of Macbeth and Kerr have been heard on the air by Radiophans who tuned in the opera broadcasts of KYW last year. The two sopranos are newcomers this year to the Chicago Civic Opera Company.

Elsewhere in this issue appears a synopsis of the opera.

As was the plan last year, KYW will broadcast the two most suitable operas each week during the season. The music and periods of waiting of all operas are

(Continued top third column)

FINDS AIRPHONE AID TO BOX OFFICE TILL



Marcus Loew, owner of Loew's Theaters, well-known vaudeville houses, has found that broadcasting his acts helps to increase the box office receipts. His station, WHN, New York City, has proven a profitable enterprise; so much so in fact that he is planning to install another plant at Boston.

not adapted to good broadcasting, so that the ones better fitted to the needs of Radio are selected.

For those unacquainted with the Chicago station, KYW transmits on a 536-meter wave length, having made this change from 345 meters when some improvements were made several months ago.

Metropolitan Still Refuses

When queried recently by a representative of Radio Digest, the management of the Metropolitan Opera Company of New York City, again stated as final its decision that the Metropolitan opera would not be broadcast. Readers of the Digest last year will recall the efforts made to no avail to convince the Metropolitan management that their performances should be broadcast as are those of the Chicago Civic Opera Company. The management of the Metropolitan is still of the opinion that broadcasting would be a detriment and is prejudiced against giving the public the benefit of their interpretations of the masters.

It remains therefore, that the East must listen to the West to hear the supreme of music, but in so doing the East will lose nothing, for music critics agree that the Chicago Civic Opera is in some respects more progressive and better than Metropolitan.

Mormons Put Conference on Air for First Time

SALT LAKE CITY.—The proceedings of the big semi-annual conference of the Mormon or Latter-day Saint Church, just held, were broadcast for the first time in the history of the church. The benediction of Chas. W. Penrose, the 92-year-old counsellor to President Heber J. Grant, could be distinctly heard in many sections of the country, it was reported.

CONTENTS

Radio Digest, Illustrated, Volume VIII, Number 5, published Chicago, Illinois, November 10, 1923. Published weekly by Radio Digest Publishing Company, 123 West Madison Street, Chicago, Illinois. Subscription rates, yearly, Five Dollars; Foreign Postage One Dollar additional; single copies, Ten Cents. Entered as second-class matter at the postoffice at Chicago, Illinois, under the Act of March 3, 1879.

"All the Live News of Radio".....	1 to 9
An Evening at Home with the Listener In.....	5
Double Tube Circuit in Simplex Picture Form.....	10
Further Details of Miloplex Hook-Up.....	11
Advance Programs.....	12
Simple Explanation of Radio for Everybody, Chapter IV, Part III—Inductances—Fixed and Variable, by M. W. Thompson.....	15
Editorials; Indi-gest; Condensed, by Dielectric.....	16
How to Build a Miloplex Receiver, by H. J. Marx.....	17
Another Single Tube Reflex, RD-102.....	18
Simple Coil Increases Range of Old Set.....	19
Review of Books.....	20
Audio Amplification for the Flewelling Set, Part III, by E. T. Flewelling.....	21
Inside Mounting for Honeycomb Coils.....	21
Questions and Answers.....	22
Broadcasting Stations, Part IV—Station Schedules.....	23
Radio Illustrated, a Page of Pictures.....	24

Looking Ahead

When You Wire Your Three-Tube Miloplex III—Use either one of the two hook-ups H. J. Marx will give you next week. He will tell how to wire the famous "Plexy" to get the most out of it. Anyone building the popular new circuit would be foolish to miss reading this article.

Copyrighted Music, the A. S. of C. A. and P., and the Story of the National Broadcaster's Association—Beginning next issue, a serial exposé of the obstacles thrown in the way of but surmounted by the spunky stations who banded together and are now laughing at the "music trust" that threatened to throttle all popular song broadcasting.

Capacities, Fixed and Variable—The title of M. W. Thompson's next chapter in his series on the principles of Radio. Read this interesting explanation of variable and fixed condensers so that you'll know why a condenser "percolates."

The Mysterious Inventor of the Miloplex says that he will devote his article next week to the "interesting-if-true" analyses of what makes a Plexy plex. Not being confirmed to his own theories, he will give a few proposed by well-known engineer friends.

Build a Multiple Phone Jack Box according to the instructions to be given next issue, and then you can hook on several loud speakers and headsets at the same time. Handy to have around when company drops in to hear the concert.

Much Ado About Four-Circuit Tuners—But wait till you see the one H. J. Marx is building. Tests so far have proven it superior to anything of its kind, and it is worth describing, and waiting for. Watch for the next few issues for the start of the series describing the construction.

Newsstands Don't Always Have One Left

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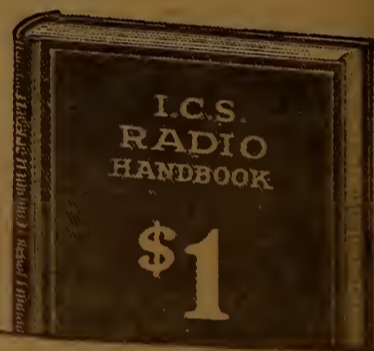
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JUST off the press! The greatest book on radio ever written. Price only \$1. Filled with sound, practical, tested information for every radio fan, from beginner to hard-bolled owl. Written, compiled and edited by radio experts of national reputation.

Every page tells you something useful. And there are 514 pages! More than 150 illustrations and diagrams!

You may dip into this I. C. S. Radio Handbook at random, or hunt up special information you want, or read it right through. Different types of receiving and sending hook-ups are explained; proposed insurance regulations; lists of broadcasting stations; radio compass stations; interesting experiments; definitions; codes and symbols; technical data and thousands of suggestions for getting more pleasure out of radio. Will save you from wasting money on things that won't work.

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EQUITY'S BAN STOPS COMEDY BROADCAST

ORGANIZATION DEMANDS ACTORS BE PAID

Volunteer Performance of "Thank-U" Called Off When Union Steps In

BOSTON.—Theatrical managers, especially those heading musical comedy companies, have begun to sit up and take notice of Radio as a means of publicity for their shows. Instead of forbidding the broadcasting stations from making use of their song hits, they are now coming to the stations voluntarily and with their entire choruses and cast of stars, to broadcast excerpts from their productions. But now comes a new obstacle, the Actors' Equity Association.

Recently the "Thank-U" company, which has been playing at the Hollis Street theater for six weeks, after a run of 300 nights at the Longacre Theater in New York and 200 nights at the Cort Theater in Chicago, planned to give excerpts from the comedy from WNAC, with the entire cast volunteering.

Equity Blocks Broadcast

The plans, however, were upset at the last minute by the action of the Actors' Equity Association, who demanded that those performers who took part in the broadcasting be paid one-eighth of their proportional salaries for one day, for performing in the broadcasting studio. This came as a surprise, not only to the management of WNAC, but to the management of the company and the performers themselves.

The latter said they had no knowledge of anything in the union rules that prevented them from volunteering for such a performance. Rather than start any controversy, the management of Station WNAC called off the program, broadcasting an announcement to that effect, and leaving the question to be possibly threshed out at some future date.

Trace Annoying "Hum" with Antenna on Auto

Leaky High Voltage Transformer Blamed for Disturbance

CINCINNATI.—Radio is being put to a novel use in this city, that of tracing a leaky high voltage transformer supposedly belonging to the Union Gas and Electric Company, which organization supplies the city with gas and current.

For the past few weeks, broadcast listeners in northern suburbs of the city have been greatly disturbed by what they at first thought to be some new form of static. Old time Radio men, however, quickly diagnosed the true cause of the trouble, and notified the Union Gas and Electric Company to repair its transformer. As there are a number of transformers in this section, however, it was found impossible to locate the source of the disturbance, hence the hum persisted to such an extent that for many it virtually drowned out even the two local broadcasting stations.

A Radio set with a loop antenna was mounted on an automobile and the car was driven through every street in the district, an operator in the machine listening in and turning the loop continually. While the defective transformer has not yet been located, due to the fact that only a few such pilgrimages have been made to date, the district is being constantly restricted, and it is a matter of days only until the source of trouble will be found.

Russ-Franco Pact Ratified

WASHINGTON.—Ratification has been made of the contract between the French Compagnie General de Telegraphie Sans Fil and the Russian Radio Electric Trust, according to cable advices from Paris. The agreement provides for the installation of stations and the manufacture of apparatus in Russia.

BISHOP'S TIMEPIECE SPOILS HIS SERMON

CHICAGO.—Bishop Wm. F. McDowell recently talked against time at the Sunday Evening club's meeting, broadcast by direct wire through Station KYW here, and time evidently won the contest. Radio-phans protested that the ticking of the bishop's watch placed too close to the microphone on the pulpit, made enough noise almost to drown out the sermon.

HARVARD GAMES TO GO ON AIR AT WNAC

BOSTON.—Three of the Harvard games at the stadium have been broadcast by WNAC, the Shepard Stores station here, and two more will be. The ones yet to go on the air are Harvard vs. Brown, November 17, and Harvard vs. Yale, November 24. Paul Waltee, well-known sports and feature writer, announces the games play by play.

CHARLES P. STEINMETZ DIES



A surprised world was recently shocked by the news of the death of Charles P. Steinmetz. Photo shows the famous electrical engineer in one of his characteristic poses P. & A. Photo

ELECTRICAL WIZARD, STEINMETZ, PASSES

WORLD-FAMOUS ENGINEER DIES UNEXPECTEDLY

Keen Brain Predicted Transmission of Power by Radio—Death Great Loss to World

SCHENECTADY, N. Y.—Dr. Charles P. Steinmetz, wizard of the electrical world, died at his home here on the morning of October 26. Physical breakdown of the man, whose great loss to the world is that of the greatest electrical engineer, was given as the cause of his death. A recent trip he had made to the Pacific coast had greatly sapped his strength and confined him to his bed two weeks previously with a heavy cold.

Not even his doctors had any indication that the end was near. He had seemed to be recovering from the exhaustion of his western tour. When the trip was planned and made, his physicians knew the condition of his heart and arranged everything for a minimum of exertion, but as it was his first trip to the West, the electrical wizard was very active.

Passes without Warning

On the morning of his death he awakened cheerful and made a remark that he was feeling fine and expected soon to have the liberty of the house. When asked by his nurse how he felt he responded, "I'm feeling fine."

When he was about to be served with breakfast he said that he felt a little tired and a few minutes later turned over on his side and passed away without sign or warning.

The funeral of Dr. Steinmetz was impressive for the eminent scientists who rushed to attend. It was strictly private, but thousands of his friends came to his house to pay homage. The brilliant man who was consulting engineer for a great factory employing 20,000 men, had never married. He was fifty-eight years old.

Was Born in Germany

Dr. Steinmetz was born at Breslau, Germany, April 9, 1865. He came to this country thirty-four years ago.

He was educated in Germany and Switzerland. He arrived in America in 1899, penniless, and started at the bottom of the ladder. He was employed first by a firm in Yonkers, N. Y., which later was absorbed by the General Electric Works, the company for which Dr. Steinmetz was working when he died.

In 1902 he was awarded a degree of A. M. by Harvard and the following year Union College at Schenectady conferred upon him the degree of Ph. D. In 1902 he taught the science of electricity in Union College.

It was the life dream of Dr. Steinmetz to make electricity the universal power of America. He was constantly experimenting with this end in view.

Wrote Many Books

Dr. Steinmetz was the author of many books, including "Theory and Calculation of Alternating Current Phenomena," "Theoretical Elements of Electrical Engineering" and "General Lectures on Electrical Engineering."

Among Dr. Steinmetz' accomplishments were the invention of more than one hundred devices, the development of the practical electric automobile, and the making of artificial lightning of 1,000,000 volts' pressure.

The deceased scientist foresaw the future world different from the present. He predicted that this planet would communicate with Mars some day, traversing the distance of 30,000,000 miles. He also foretold the coming of the four-hour workday, and called work a curse. He foresaw the breaking up of big cities, the sending of power by Radio, a world living on microbes, and control of all industry by the people.

In New York City an undertaker operates a hearse equipped with a Radio amplifier and loud speaker. As the vehicle enters the cemetery, chimes, hymns and funeral music are played.

Syncopators Demonstrated and "Sold" by Broadcast

NEW YORK.—J. E. Horn, of this city, has perfected a novel method of demonstrating concert and dance orchestras to clients via Radio.

Heretofore a cafe, hotel or club in need of the services of an orchestra has insisted upon a demonstration of the musical organization with the result that considerable expense has been involved. Now

it has been arranged with leading stations all over the United States to demonstrate the various orchestras via broadcasting.

\$1,400 Radio Job Open

WASHINGTON, D. C.—The Civil Service commission has announced a vacancy in the Bureau of Agricultural Economics, Department of Agriculture for a Radio operator. Announcement is made that receipt of applications will close on November 20. The position will pay \$1,400 a year with a \$20 a month bonus.

THE ANTENNA BROTHERS

Spir L. and Lew P.

Romance vs. QRM



"JAZZ" TUBE KEEPS IN STEP TO BLUES

WCAP'S TRIODE DEVELOPS SYNCOPATED LIGHTS

Engineers Rise to Defense of Tired Vacuum Container, Saying It's Caused by Gas Remaining

WASHINGTON.—The national craze for jazz may affect vacuum tubes. This is the latest development in broadcasting news. When a Radio transmitting tube shows unmistakable signs of becoming converted to jazz music and develops a blue light which dances in perfect cadence and absolute abandon to the "blue" notes of a moaning saxophone, "what chance has the advocate of grand opera broadcasting?" Radio engineers and operators ask.

Such is the situation at the Chesapeake and Potomac Telephone broadcasting station, WCAP, every time it broadcasts the music of Le Paradis Orchestra or the Metropolitan Theater. On all other occasions the tube maintains a solemn dignity befitting the occasion, and performs in a highly efficient manner, it is said.

Rise to Defense of Tube

The engineers who carefully avoid discussing the ethics of the equipment, rise to the defense of the tube to say that the blue light is probably caused by a small amount of gas which is present in some quantity in all vacuum tubes. When the tube is working, the gas becomes ionized, and if present in sufficient quantity, gives off a bluish light. The vividness of this light, it is explained, is increased with the modulation and with the changes in volume of the music. When a heavy chord is struck, the light visibly brightens, with the result that during a jazz piece the blue light keeps absolute time with the music, bringing out the beats, thus emphasizing the syncopation.

"That's as it should be," say the lovers of jazz. "Even a Radio tube gets a thrill out of popular music." The students of Wagner, Beethoven and Liszt, however, scoff at the idea, claiming "that jazz gives the tube the blues."

Radio receiving sets are installed on coaches of several railway lines in England.

ELECTED PRESIDENT OF BROADCAST BODY



Eugene F. McDonald, Jr., of the Zenith-Edge-water Beach Hotel broadcasting station, WJAZ, who was elected president of the National Association of Broadcasters at their recent annual meeting. This organization is doing much good in providing broadcasting stations with popular music, the copyrights for which are not controlled by the "music trust"

Successful Girl Talks to Fans

NEWARK, N. J.—Continuing in the interesting series of "Half Hours with Successful Women," which is being featured in the WOR programs, Mrs. Edith Ellis Furniss, playwright, recently talked from the L. Bamberger and Company station. She related her experiences of the theater, which are diversified and interesting and cover years.

Twenty-Kilowatt Tubes at Six Big New Code Stations

NEW ORLEANS.—Six transmitters, to be the most powerful on the American continent, operating from vacuum tubes and first to make use of the recently developed twenty-kilowatt Radiotron, are being installed by the United Fruit Com-

pany and the Tropical Radio Telegraph Company at points in Central America and the United States for the purpose of completing the links of an adequate communications system between the Americas.

The transmitters will be located at New Orleans, La.; Miami, Fla.; Puerto Barrios, Guatemala; Tegucigalpa, Honduras; Managua, Nicaragua, and Almirante, Panama.

Thrills from Radio

No. 2 of a Series Featuring Experiences of "ALL-AMERICAN" Users

They're "There" in Selectivity

By R. Disheroon, Hot Springs, Ark.

"Out of four makes of trans-formers, I have found the 'All-American' best either in a straight radio frequency or a reflex circuit. wiring, I succeeded in reducing the oscillations nearly to zero using Moorehead tubes."

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"Using two 3-1 ratio 'All-American' Audio Frequency and two 'All-American' Radio Frequency Transformers in the Grimes Reflex, by careful placing of the transformers and the



All-American Audio Frequency Transformer — comes in three ratios.

Don't spend time and money experimenting — over 300,000 radio enthusiasts, like Mr. Disheroon, have already proved that "All-Americans" are best. And they are standard equipment on the better sets.

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RADIO FREQUENCY

ALL-AMERICAN AMPLIFYING TRANSFORMERS

Largest selling Transformers in the world

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Complete Parts for Miloplex Circuit—Cabinet Free

1 .0005 Variable Condenser, Vernier..... \$8.00	3 3 1/2-Inch Dials, each 75c..... \$2.25	1 B Battery, Burgess, 22 1/2 volt..... \$3.00
1 Estru Variometer..... 5.00	1 Potentiometer, 1850 ohm..... 2.20	3 Dry Cells..... 1.35
1 .00025 Variable Condenser..... 2.00	1 Rheostat..... 1.00	12 ft. sq. brass bus wire..... .30
1 Variable Grid Leak..... .75	1 Socket Bakelite Base..... .90	1 Set Readem Bind. Posts..... .75
1 .00025 Mica Fixed Condenser..... .40	1 Bakelite Panel 9x14x 3/8..... 2.50	
2 .002 Phone Condensers..... .80	1 DeForest D.V. 6 Tube..... 6.50	
		TOTAL..... \$35.70

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Blue print FREE only with order for complete parts

Selective Long Distance Receiver

(See October 13, 1923, Radio Digest RD 100)

3 Tube Sockets, Bakelite Bases..... 2.70	1 Radiometer..... 6.00
1 .0005 Condenser, Variable Vernier..... 6.00	1 Honeycomb, 75 turn..... 1.20
1 Single Coil Mounting..... .50	1 Variable Grid Leak and Condenser..... 8.00
1 Dgen Circuit Jack..... .75	3 Rheostats..... 3.00
1 .00025 Mfd. Fixed Mica Condenser..... .40	1 .005 Mfd. Fixed Mica Condenser..... .75
1 Set Readem Binding Posts..... .75	12 feet of Bus Wire..... 1.00
2 Double Circuit Jacks..... .75	1 Dgen Circuit Jack..... .75
2 3" Dials..... 1.00	1 3 1/2" Dial..... .75
1 Panel, Bakelite, 9x14x 3/8..... 2.50	1 Baseboard, 9x14x 3/8..... .25
1 Cabinet, 9x14x8", fine mahog. finish including blue print with panel layout. OUR PRICE..... \$39.75	
TOTAL \$44.15	

Complete Parts RD 99 Long Distance Receiving Set

(See Radio Digest, September 29th issue)

3 Bakelite Base Sockets..... 2.25	3 Rheostats..... 3.00
2 A. F. Transformers..... 8.60	2 Double Circuit Jacks..... 1.50
1 Dgen Circuit Jack..... .75	1 Estru Variometer..... 5.00
1 Variable Grid Leak and Condenser..... 1.00	1 .0005 Variable Condenser with Vernier..... 6.00
1 .005 Fixed Condenser..... .75	1 75-turn Honeycomb Coil, mounted..... 1.20
1 Single Coil Mounting..... .50	1 Set Readem Binding Post..... .75
1 Panel Bakelite, 7x16x 3/8..... 2.25	1 Cabinet, 7x16x8, fine mahogany finish..... 6.00
Our price complete with panel drawing and blue print. ONLY..... \$30.25	
TOTAL \$39.25	

Complete Parts for One Tube Reflex

1 Radiometer..... \$ 3.00	1 23 Plate Condenser..... 3.00
1 Tricoll Transformer..... 2.00	1 Audio Transformer..... 4.00
1 199 Socket..... .90	1 199 Tube..... 6.50
1 Baseboard, 7x9..... .25	1 7x9x 3/8 Bakelite Panel..... 1.25
1 Set Readem Binding Post..... .75	1 .002 Micon Fixed Condensers..... .80
1 Type B. B. Metal Detector..... 1.50	1 Cabinet, 7x9x8..... 2.50
Complete OUR PRICE ONLY..... \$22.45	
TOTAL \$26.45	

SPECIAL PRICE ITEMS

SPECIAL TRI-COIL REFLEX RADIO FREQUENCY Transformer..... \$2.00	
PHONES List Our Price	
Mico Double Phones "Sealed—Guaranteed" with Head Bands..... \$7.00	Double Phone Cord..... .75
Genuine Master-Baldwin Type C Unit..... 6.00	4.39
Genuine Master-Baldwin Type C Double..... 12.00	7.85
Loud Speaker Cord, 20 ft., 4 tips, our price..... 1.00	
WIRE	
All kinds of wire put up in 1/2 pound spools. No. 15 to No. 28, silk, cotton and enamel, double or single..... 45 cents a spool	
Same wire as above on 1/2 pound spools, 75 cents a spool	
Hook-up Wire, No. 14 pound brass, cut in 6 foot lengths..... 1.50	
RHEOSTATS AND SOCKETS	
MARVEL Rheostat, 6 ohms..... \$.35	MARVEL Rheostat, 20, 25 and 30 ohms..... .45
MARVEL Rheostat, 40 ohms..... .55	MARVEL Rheostat, 50 ohms..... .65
Potentiometer, 200 ohms..... .55	Potentiometer, 400 ohms..... .65
Potentiometer, 1,850 ohms, Federal..... 2.20	Standard Sockets, bakelite base, \$1.25..... .75
Na Aid Sockets, 35c; 3 for..... 1.00	
GRID-LEAKS List Our Price	
Freshman Grid-Leak with Condenser..... \$1.00	.75
Freshman Grid-Leak..... .75	.59
VARIOMETERS	
Moulded Variometer..... \$6.00	\$4.39
Estru Split Variometer..... 4.50	
Variometer, All Circuits..... 5.50	
Readem Binding Posts. Set composed of 1 antenna, 1 ground, 1 A Battery —, 1 A Battery —, 2 telephone, 1 B Battery —, 1 B Battery —..... \$.75	
VARIABLE CONDENSERS List Our Price	
Variable Condenser, .0005 (Same as 23 plate)..... \$5.50	\$3.00
Variable Condenser with Vernier, .0005 (Same as 23 plate)..... 6.50	4.50
Variable Condenser, .001 (Same as 45 plate)..... 6.00	3.50
Variable Condenser, with Vernier, .001..... 7.50	5.00
Walhart Variable Condenser, .00025..... 1.75	
Bakelite, cut all sizes, 3/8" thickness, 2 1/2 square inch	
CABINETS	
9x14x8, mahogany finish..... \$3.25	7x9x8, mahogany finish..... 2.75
7x21x8, mahogany finish..... 3.50	
MUST SEND POSTAGE	
H. C. Coil Mounting..... \$5.00	

THE TRADE MARK AUDIOPHONE



Quality of reproduction such as only the original itself can equal. Speech that is so distinct that the voice heard is the actual voice of the speaker. Music that requires no tolerant imagination to be recognized as music of the finest type.

Bristol's Single Stage Power Amplifier



gives additional VOLUME with any two stage amplifier. No separate batteries required. It provides the additional volume necessary to bring in very distant stations on the loud speaker.

Write for bulletin and address of the nearest dealer handling our instruments

THE BRISTOL COMPANY

WATERBURY, CONN.

Boston New York Philadelphia Pittsburgh Detroit Chicago St. Louis San Francisco

We Are Responsible Folks. Money Promptly and Cheerfully Refunded If You Are Not Satisfied

Everything in Radio Write Us

All Orders Mailed Promptly. Parcel Post Prepaid on \$5.00 or Over. No Stamps Accepted. Send Money Orders.

Quality Merchandise at Low Prices

Economical Radio House

4600 Lincoln Avenue, Chicago

We Personally Guarantee All Goods

WTAM, BATTERY FED, HAS NO HUM



Many fans undoubtedly have heard a new call recently, WTAM. Above are a few pictures from the station, which is owned and operated by the Willard Storage Battery Company of Cleveland. No generator hum can possibly be in WTAM's carrier wave as it is operated entirely from storage batteries. Center is a view of the studio. Left is A. R. Herske, announcer, and right is S. E. Leonard, operator. Mr. Leonard designed and personally supervised the installing of Station WTAM.

Photos specially posed for Radio Digest

WNAC Gets a Home of Its Own in Boston

"Frank's Place" Famous in "Wet" Days Is Remodeled

BOSTON, MASS.—Station WNAC, The Shepard Stores here, now has a home of its own. The Winter Place Hotel, famous in pre-Volstead days as "Frank Locke's place," has been remodeled for the purpose, and work is fast being completed to have the new studio ready for occupancy.

The broadcasting and entertainment will be on the third floor of the building, the second floor being reserved for a big employees' lunch room for the clerks of the Shepard Stores. There will be two separate studios with a spacious reception room, for the station, with an announcer's booth, which will be located in a sound-proof room opening into both studios, so that programs can go on continuously.

Duck for Apples by Radio at WOR "Hallowe'en Party"

NEWARK, N. J.—A recent novelty on the WOR program was the broadcast of an old-fashioned "Hallowe'en Party" held in the studio. The party was held from 8:45 to 11 p. m., eastern time, and consisted of ducking for apples, ghost stories and thrilling tales of Hallowe'en superstitions.

The program included dance music furnished by the Elite Orchestra and several numbers sung by the Royal Male Quartette of New York. The usual announcing was dispensed with and the microphone was left open continuously throughout the evening.

According to Dr. Lee De Forest, pioneer radio inventor, in less than five years there will be a radio audience of 20,000,000 persons in the United States.

CAPETOWN, S. AFRICA, PONDERERS BROADCASTS

Plant Will Be Controlled by City Instead of Individuals

CAPETOWN, S. AFRICA.—As the result of an offer made by Sir David Graff here to present this city with a Marconi broadcasting station, a special committee of the city council is now considering a scheme of municipal broadcasting. The council is anxious to reserve for itself the privilege of broadcasting for

a period of fifteen years since it believes that broadcasting in the hands of private enterprise might be misused. Their report continues:

"The equipment of this station will be furnished by the Marconi Company of England, which will also supply the technical assistance to supervise its operations. With the exception of several experiments made by the South African newspapers, the Cape Town broadcasting station will be the first permanent venture of its kind in South Africa."

Radio experiments are being conducted at the Hudson County Hospital, at Secaucus, N. J., for patients suffering from mental ailments. Various entertainments are given for the treatment of the insane.

The "A" Battery's Power in Your Radio Receiving Set

THIS IS NUMBER TWO OF A SERIES

THE sole purpose of the "A" Battery in your Radio Receiving Set is to furnish current to heat the filaments of the tubes.

And this can be done satisfactorily only by an "A" Battery that supplies an adequate steady current.

Anticipating the popularity of the dry cell tube in Radio, and realizing that it required a Dry Cell capable of standing up under service conditions differing from what dry cells are called upon to meet in other fields, the National Carbon Company developed the Eveready Radio Dry Cell specifically for this new use.

A dry cell gives its maximum service only when designed especially for the work it is intended to perform. There are for dry cells several uses which are so alike that one type of cell serves for all. This is the field covered by the ignition or general purpose dry cell.

The conditions encountered in Radio are different from the conditions grouped together under the term "general purpose." And while the general purpose dry cell performs well as an "A" Battery, it was found possible to produce a Dry Cell "A" Battery capable of delivering more service on Radio loads.

Thirty years of dry cell experience and an immense research organization resulted in the superior Eveready Radio Dry Cell. One of the outstanding features of this special cell is that while it will last much longer when used as an "A" Battery, it is no larger than the standard dry cell.

The increased service life of the Eveready Dry Cell "A" Battery greatly offsets the slight increase in cost; so this battery is not only the best, but it is the most economical you can buy. "The Story of Eveready Dry Cell Radio 'A' Batteries," which tells how to use Dry Cells to the greatest advantage with the various dry cell tubes now available, will be sent to you free on request.

Note: This is number 2 of a series of informative advertisements which will appear in this magazine. They are designed to help users get the most out of their Batteries and their Radio Sets. If you have any battery problem, write to G. C. Furness, Manager Radio Division, National Carbon Company, Inc., Thompson Avenue and Orton Street, Long Island City, N. Y.



POWER
for Your Radio Set
Eveready Dry Cell
Radio "A" Battery
(No. 7111)

Directions and wiring diagrams on the jacket tell just how to use this battery with the different dry cell tubes.

This special Radio Cell is also available in two and four cell multiple batteries for receiving sets employing from two to four WD-11 or WD-12 tubes.

Other Radio Batteries

Eveready Storage "A" Batteries—best suited for filament heating of all Radio Tubes not especially designed for dry cells. The quality storage battery with the long life plates, \$15 to \$20.

Eveready "B" Batteries—the life of your Radio.

Eveready "Three" Battery—3 cells, 3 purposes.

Manufactured and guaranteed by
NATIONAL CARBON COMPANY, Inc.

EVEREADY

Radio Batteries

—they last longer

AN EVENING AT HOME WITH THE LISTENER IN

(SEE INSTRUCTIONS FOR USE BELOW)

Station and City	Mct.	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
CFCN, Calgary, Alta.	440	12:00-1:00		11:00-2:00			11:00-1:00	
CKAC, Montreal, Que.	430		6:00-8:30		6:00-8:30		6:00-8:30	3:30-4:30
KDKA, E. Pittsburgh, Pa.	326	5:00-9:00	4:00-8:00	5:00-9:00	5:00-9:00	5:00-9:00	5:00-9:00	6:30-7:30
KDZE, Seattle, Wash.	455	10:30-12:30		10:30-12:30				
KFAE, Denver, Colo.	360	9:00-10:00	9:00-10:00		8:30-9:00	10:30-12:30	9:00-10:00	
KFI, Los Angeles, Calif.	469	8:45-1:00	8:45-1:00	8:45-2:00	8:45-1:00	8:45-2:00	8:45-2:00	10:00-1:00
KGW, Portland, Ore.	492	10:00-12:30	10:00-1:00	10:00-1:00	10:00-1:00	10:00-1:30	10:00-1:00	8:00-10:00
KHI, Los Angeles, Calif.	395	8:45-12:00	8:45-12:00	8:45-12:00	8:45-12:00	8:45-12:00	8:45-12:00	10:00-12:00
KPO, San Francisco, Calif.	423	10:00-12:00	10:00-12:00		10:00-12:00		10:00-2:00	10:00-12:00
KSD, St. Louis, Mo.	546	8:00-10:00	8:00-1:00	8:00-1:00	8:00-9:00	8:00-10:00	8:00-10:00	
KYW, Chicago, Ill.	536		8:00-9:00	8:00-9:00	8:00-9:00	8:00-9:00	8:00-9:00	
NAA, Radio, Va.	435	5:45-7:20	6:05-7:20	6:25-7:40	5:45-7:40	7:05-7:40		
PWX, Havana, Cuba	400			8:00-10:30			8:00-10:30	
WBAP, Fort Worth, Texas	476	7:30-10:30	7:30-10:30	7:30-10:30	7:30-10:30	7:30-10:30	7:00-7:30	5:00-6:00
WBAV, Columbus, O.	390	7:00-9:00						
WBZ, Springfield, Mass.	337	6:30-8:00	6:30-8:00	6:00-8:00	6:30-8:00	6:30-8:00	6:30-8:30	7:30-8:30
WCAP, Washington, D. C.	469		5:30-6:30		8:45-11:00		5:30-11:00	5:20-8:00
WCBD, Zion, Ill.	345	8:00-10:00				8:00-10:00		2:30-5:30
WCX, Detroit, Mich.	517	7:30-9:00	7:30-11:00	7:30-9:00	7:30-9:00	7:30-9:00		6:15-7:15
WDAF, Kansas City, Mo.	411	8:00-1:00	11:45-1:00	8:00-1:00	11:45-1:00	8:00-1:00	11:45-1:00	4:00-5:00
WDAJ, College Park, Ga.	258	7:30-11:30	7:30-11:30	10:30-11:30	7:30-11:30	7:30-11:30	7:30-11:30	7:30-11:30
WDAV, Chicago, Ill.	360		7:00-1:00	7:00-1:00	7:00-1:00	7:00-1:00	7:00-1:00	9:15-11:15
WDAR, Philadelphia, Pa.	395	6:30-9:55	6:30-7:00	6:30-10:00	6:30-7:00	6:30-12:00	6:30-7:00	
WDT, New York, N. Y.	405			6:00-7:00		10:00-11:00		
WEAF, New York, N. Y.	492	6:30-9:00	6:30-9:00	6:30-9:00	6:30-9:00	6:30-9:00	6:30-10:00	6:30-9:00
WFAA, Dallas, Tex.	476	8:30-9:30	8:30-12:00		8:30-9:30	8:30-9:30	8:30-12:00	9:30-11:00
WFI, Philadelphia, Pa.	395	6:00-6:30	8:00-8:00	6:00-6:30	6:00-8:00	6:00-6:30	6:00-6:30	6:30-7:30
WGL, Medford, Mass.	360		6:00-7:30	6:30-8:00	6:00-7:30	6:30-8:00	6:30-8:00	7:30-10:00
WGR, Buffalo, N. Y.	319	5:30-9:00	5:30-7:45	5:30-9:00	5:30-7:45	5:30-9:00	5:30-7:45	
WGY, Schenectady, N. Y.	380	6:45-9:00	6:45-9:00		6:45-9:00	6:45-10:00		5:30-6:30
WHA, Madison, Wis.	360	7:30-8:30		7:30-8:30		7:30-8:30		
WHAS, Louisville, Ky.	400		7:30-9:00	7:30-9:00	7:30-9:00	7:30-9:00	7:30-9:00	4:00-5:00
WHAZ, Troy, N. Y.	380	8:00-9:30						
WHB, Kansas City, Mo.	411		8:00-10:00		8:00-10:00			8:00-10:00
WHK, Cleveland, O.	360	5:00-5:30	5:00-5:30	5:00-5:55	5:00-5:30	5:00-5:30	5:00-5:30	7:00-8:55
WHN, New York, N. Y.	360	0:30-11:00	8:30-11:00	6:30-11:00	8:30-11:00	8:30-11:00	6:30-11:00	8:10-11:00
WIP, Philadelphia, Pa.	509	5:00-6:30	5:00-11:00	5:00-6:30	5:00-10:00	5:00-6:30	5:00-11:00	3:30-4:30
WJAX, Cleveland, O.	390		6:30-8:30		7:00-9:30			
WJAZ, Chicago, Ill.	448		10:00-2:00	10:00-2:00	10:00-2:00	10:00-2:00	10:00-2:00	6:00-9:00
WJZ, New York, N. Y.	455	6:30-10:30	6:30-10:30	6:00-10:30	6:30-10:30	6:30-10:30	6:30-10:30	7:00-9:30
WKAQ, San Juan, P. R.	360		7:00-8:30				7:00-8:30	
WLAG, Minneapolis, Minn.	417	7:30-10:00	7:30-10:00	7:30-12:30	7:30-10:00	7:30-10:00	7:30-12:30	7:45-8:45
WLW, Cincinnati, O.	309	8:00-10:00	10:00-12:00	8:00-10:00	10:00-12:00			
WMAQ, Chicago, Ill.	448		7:00-10:00	7:00-10:00	7:00-10:00	7:00-10:00	7:00-10:00	4:30-5:00
WMC, Memphis, Tenn.	500	8:30-9:30	8:30-12:00		8:30-9:30	8:30-12:00	8:30-9:30	
WNAO, Boston, Mass.	278		7:00-9:00	8:00-10:00	7:00-9:00	7:00-9:00	8:00-10:00	5:30-7:30
WQAI, San Antonio, Texas	385		9:30-10:30		7:30-8:30		9:30-10:30	9:30-10:30
WQAW, Omaha, Neb.	526	9:00-10:00	9:00-10:00		9:00-10:00	9:00-10:00	9:00-10:00	9:00-10:00
WOC, Davenport, Ia.	484	8:00-9:00		8:00-11:00	8:00-9:00	8:00-9:00	9:00-10:00	7:00-10:00
WOO, Philadelphia, Pa.	509	6:45-10:00			6:45-10:00			
WOR, Newark, N. J.	405	5:15-10:00	5:15-6:30	5:15-10:00	5:15-6:30	5:15-6:30	5:15-10:00	
WOS, Jefferson City, Mo.	441	8:00-9:30		8:00-9:30		8:00-9:30		
WRC, Washington, D.C.	469	7:00-9:00		7:00-9:00		7:00-9:00		
WSAI, Cincinnati, O.	309		8:00-10:00		8:00-10:00		10:00-12:00	
WSB, Atlanta, Ga.	429	8:00-12:00	8:00-12:00	8:00-12:00	8:00-12:00	8:00-12:00	8:00-12:00	7:30-9:15
WST, Birmingham, Ala.	360	8:00-8:45		8:00-8:45		8:00-8:45		8:00-9:00
WTAM, Cleveland, Ohio	390			7:00-8:30			8:00-10:00	
WWJ, Detroit, Mich.	517	7:30-9:00	7:30-9:00	7:30-9:00	7:30-11:00	7:30-9:00		4:30-5:30

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

The "A" Battery gives power to your Radio Receiving Set. Eveready Batteries—especially made for Radio—serve better, last longer, give better results.

'RADIO EAR' IS NEW PAIN FOR LISTENER

TIGHT HEAD PHONES BRING ON AFFECTION

Sharp, Shooting Sensation in Head Symptom; Doctor Tells How to Bring About Cure

By Carl H. Buttman

WASHINGTON.—A new affection of the ear is being reported by some Radiophans, who sit for long periods at their receiving sets. It is called "Radio Ear" and is accompanied by noticeable pains in the auditory appendages even when not listening in. Sometimes it takes the form of sharp shooting pains in the head near the ears which cause thoughts of possible abscesses or other serious afflictions.

Upon consultation, ear specialists usually say that the remedy is easy and fairly sure. "You are a Radiophan?" they ask. "You spend a good portion of your time with your head phones on?" Upon receiving your replies in the affirmative, they say, "Well, when you go home loosen up on your head phones. The spring is too tight and presses on some of the nerves of your ear. Just like some forms of spectacles," they will tell you. "Your head set is undoubtedly causing the pains. Relieve the excessive pressure and it will disappear."

One assurance is given of a benefit from Radio head sets, however: Youths of this generation will never have as protruding ears as some of their older brothers. All youngsters who sit for as much as three hours a day with their head phones clamped over their ears will grow up with close-fitting ears, most experts believe. Mothers who formerly tied back their offspring's ears to prevent their protruding will be saved that worry and trouble if they provide their children with Radio receiving sets and head phones.

Boston to Continue Air Sermons
MEDFORD HILLSIDE, MASS.—The airphone pulpit conducted every Sunday evening by the Greater Boston Federation of Churches from WGI will be continued throughout the winter. Each month one night will be devoted to interests covered by the general committees of the federation, and an authority on each line of civic and religious activity will talk for fifteen minutes on Sunday nights.

RETAIL FIELD TAKES PIONEER ANNOUNCER

Major J. Andrew White, former editor of an eastern Radio paper and well-known broadcaster, has associated himself with a retail Radio house. He will continue to broadcast sporting events, and is here seen announcing the recent World's Series over WJZ, New York



Royal Order of Wouff Hong Plans to Initiate at Atlanta

ATLANTA, GA.—The Royal Order of the Wouff Hong, a secret organization of amateur Radio men, will once more predominate as the feature of an American Radio League convention when amateurs of the fourth district meet in this city for three days, December 27, 28 and 29, for a great "hamfest," according to the announcement of a tentative program today by H. L. Reid, manager of the League's East Gulf Division. An initiation into the weird order will take place on the last night of the convention.



Used by Radio Experts Because They're Federal Standard

Knowing the vital importance of the head set in their work, professional radio men demand the best. This undoubtedly accounts for the tremendous call for Federal Standard Head Sets among these experts.

A good Radio Set is frequently made poor by a cheaper head set.

130 Federal Standard Radio parts offer the radio enthusiast a complete line of guaranteed parts of one quality—the best.

List price 2200 OHMS

\$7.00

Federal

Standard RADIO Products



Tame The Wild Waves

with a Service Type 212 Receiver. Will tune through local phone and telegraph interference and get the distant stations. 30 inches loop antenna furnished with set.

Price \$150.00

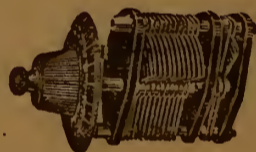
Why take our word for what "Service" will do. Ask your dealer.

This is a TELEFORCE product.

Dealers, Jobbers, Write for Terms and Complete Information.

SERVICE RADIO CO.

4749 Montgomery Ave., Norwood, O.



WILLARD

WILLARD RADIO COMPANY

291 BROADWAY,
New York City

"THE BEST FOR LESS"



REINARTZ CIRCUIT EVERY PART COMPLETE

1 Reinartz wound coil, 1 tube socket, 1 rheostat, 1 23-plate .0005 MFD. variable condenser, 1 13-plate .00025 MFD. variable condenser, 3 inductance switches, 23 switch points and nuts, 6 switch stops and nuts, 8 binding posts, 2 3" dials, 1 variable grid leak, 1 .002 MFD. phone condenser, 23 feet bus bar wire, 1 high-grade panel ALREADY DRILLED AS PER DIAGRAM and complete instructions. **\$10.95**

Two-Stage Audio Frequency Amplifier—Parts complete in every detail for this Circuit—\$11.00
Specify type of tubes you intend using

CONDENSERS

3 Plate Variable; value, \$1.75	\$1.05
11 Plate Variable; value, \$2.50	1.20
13 Plate Variable; value, \$2.50	1.20
17 Plate Variable; value, \$3.50	1.55
23 Plate Variable; value, \$3.50	1.35
43 Plate Variable; value, \$4.50	1.95
13 Plate VERNIER; value, \$5.50	\$3.75
23 Plate VERNIER; value, \$6.00	4.00
43 Plate VERNIER; value, \$6.50	4.25

Honeycomb Coils, 50 turns mounted	\$.95
Honeycomb Coils, 75 turns mounted	1.00
Double Coil Mountings	2.45
Triple Coil Mountings	3.35
Reinartz Coils, increased wave-length and mounting	1.95

VARIOCOUPLER—Celeron Condensate and Litz Wire Wound Secondary; Value \$4.50. Special \$2.25

AUDIO FREQUENCY TRANSFORMER—Designed for use with W. D. 11 Tubes, list, \$4.50; price \$2.75

BALL BEARING INDUCTANCE SWITCH—value, 75c; special \$2.25

V. T. SOCKETS—Nickel, brass sleeve, composition base; value, \$1.00; special at .40

EXTRA SPECIAL—Telephone 3000 Ohms Headset; \$9.00 value; reduced to 3.50

Vernier Dial Adjuster, List, 35c; special .25

FLEWELLING CIRCUIT EVERY PART COMPLETE

2 honeycomb coils, 1 2-coil mounting, 2 coil plugs, 3 .005 condensers, 1 variable grid leak, 1 grid leak, 1 23-plate .0005 MFD. variable condenser, 1 Vernier rheostat, 1 tube socket, 8 binding posts, 20 feet bus bar wire, 1 3" dial and 1 high grade panel ALREADY DRILLED as per Diagram in Booklet of instruction sent free. **\$11.95**

Two-Stage Audio Frequency Amplifier—Parts complete in every detail for this Circuit—\$11.00
Specify type of tubes you intend using

BEST QUALITY JACKS, Single Circuit; value, 65c; special at .30

Double Circuit; value, 90c; special at .45

MULTIPLE POINT INDUCTANCE SWITCH with Knob and Dial (15 Switch Points) \$1.25

LIGHTNING ARRESTERS approved by underwriters .90

THREE-INCH DIALS—Unbreakable—heat resisting composition—high finish; special .30

TWO-INCH DIALS—Same design—for rheostats and potentiometer; special at .25

Filament Rheostat, 6 ohm .65

Filament Rheostat, 20 ohm .80

Filament Rheostat, 50 ohm .90

With 2" Dial, 15c extra.

TELEPHONE PLUGS .60

FRESHMAN VARIABLE RESISTANCE LEAK and MICA CONDENSER Combined .75



Half the pleasure of Radio is in building your own sets. Many pleasurable and profitable hours can be passed in this way. Our service department will be glad to give you any information you need. Just drop us a line.

Every article advertised above is guaranteed by the manufacturer and by us—Mail orders filled immediately—transportation PREPAID on all orders of \$5.00 or over east of the Mississippi River. Send cash, check or money order—absolutely no goods sent C. O. D.



WOR, WJAX AND KGW THEMSELVES



The popularity of a broadcasting station is not due exclusively to the performers; up-to-date equipment has its share and so has the announcer. Above is Joseph Barnett, familiar to listeners in on WOR, the Newark, N. J., station, as "J. B." In the circle is E. J. Johnson, who has won deserved recognition for the efficient manner in which he has worked out the broadcasting of "The Wave from Lake Erie" from WJAX, the Union Trust Company's station at Cleveland. Above Photo © K. & H.

Above is presented another announcer, Richard W. Haller, who is also director of The Oregonian's station KGW, at Portland. His popularity is in part due to his being "Keeper of the Grand Goat" of the "Keep Growing Wiser Order of Hoot Owls," the famous burlesque club of KGW. Whether or not there actually is a goat to be kept is uncertain and doesn't matter, but natural "baa-as" are often heard and listeners in have presented him with enough goat bells to make a fair set of chimes.

U. S. TAKES DAILY TESTS OF LENGTHS

KEEPS BROADCASTERS ON LICENSED WAVES

Prompt Readjustment of Plant by Radio Supervisors Follows Disclosure of Inaccuracy

WASHINGTON, D. C.—In order to assist the Radio Inspection Service in maintaining broadcasters on their licensed wave lengths, the Bureau of Standards now makes daily measurements of the waves radiated from various stations. The measurements to date have been mainly on Class B broadcasting stations, and also on the high wave length, high-power transoceanic stations.

The measurements show in general a close degree of adherence to the assigned frequencies. In a few cases where the tests showed stations to be seriously off the assigned wave, the supervisors of Radio have readjusted the stations to bring them within the required tolerance.

In only a few cases are the stations maintaining without exception the assigned frequencies so closely that the wave can be used as a frequency standard.

To Use Waves to Calibrate

Special attention is being given by the bureau to the stations which do maintain such standards, and an announcement will be made later in the Radio Service Bulletin, stating the degree of constancy that has been observed, so that persons may utilize the transmissions from these sta-

tions as a standard for the calibration of apparatus.

The method used by the bureau in measuring the waves of distant stations involves the use of a local Radio frequency generator. This is adjusted to the same frequency as the wave received from the transmitting station, the adjustment being determined by receiving both frequencies in a receiving set and varying the local Radio frequency generator until a zero beat note is obtained. The frequency of the local generator is then measured with a wavemeter.

New Firm Organizing in Italy Will Make Outfits

WASHINGTON, D. C.—Reports from the American commercial attaché at Rome state that a firm has just been organized in Italy for broadcasting and for the manufacture of Radio apparatus. While information in regard to the new company is somewhat limited at present, the enterprise has every indication of being an attempt to provide Italy with a huge Radio manufacturing and operating organization similar to the Marconi Company of England and the Radio Corporation of America. Up to the present time Radio activities in Italy have been almost solely confined to the government.

Names New Seattle Inspector

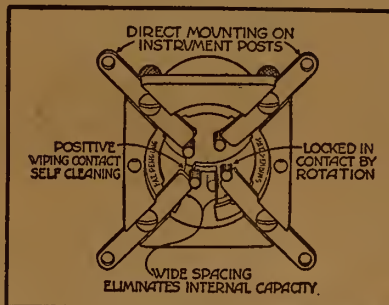
WASHINGTON.—The Department of Commerce has designated Harold D. Hayes, of San Francisco, as assistant Radio inspector to succeed Louis E. Richwein, of the Seattle office, who died recently. Mr. Richwein, who was transferred from Baltimore in 1922, served until recently at the headquarters of the seventh district at Seattle, as assistant to Supervisor of Radio O. R. Redfern.

Floodbound "Gadders" Get Late News by Air Bulletin

FT. WORTH, TEX.—WBAP, Star-Telegram here, came to the rescue of a party of one hundred marooned traveling and business men at the Oriental Hotel, Altus, Okla., recently, by furnishing them with a special bulletin of the news, the only word they had received in some hours. A flood had cut off the one hundred men from communication and the hotel man-

agement wired asking a special news bulletin for the benefit of the floodbound travelers. Accordingly, WBAP broadcast a condensed news bulletin before the usual 7:30 program.

Congress will be asked at the next session for increased appropriations, amounting to more than \$100,000, to meet the department of commerce needs in Radio control.



E.J. Flewelling Sockets

The action of your tube is greatly dependent upon the socket that holds it. Mr. Flewelling has shown the gains possible through careful design in this important part of the Radio set and now you are offered the benefits of his experience and research—a socket as near perfect as we can make it. Losses due to faulty contacts, capacity between terminals etc., are entirely eliminated. Order a set today.

BUELL MANUFACTURING COMPANY

2977 COTTAGE GROVE AVE. CHICAGO

\$1.00 At your dealers or post paid.

RADIO TALKS

So called tube noises are most often caused by poor contacts, dampness, soldering paste and many small condenser effects caused by crossing, touching and parallel wires throughout the set. Clean up these defects and then listen in for "tube noises." You will be surprised to find how quiet your tubes really are.

E.J. Flewelling

The New Grebe Broadcast Receiver

THE 20-foot silk-covered wire supplied with this Receiver is the only antenna required. This wire may be concealed behind the picture moulding or run along the baseboard.

'Write for "Grebe Radio in the Well-Appointed Home"

Licensed under Armstrong U.S. Pat. No. 1,113,149

Ask Your Dealer

A. H. GREBE & CO., Inc. Richmond Hill, N. Y.



INDICATIONS INSURE SUCCESS OF "WEEK"

PLAN TO FOLLOW CHICAGO RADIO SHOW

November 25 to December 1 Set Aside as Period to Educate Public to Best in Radiophony

CHICAGO.—Immediately following the Radio show in Chicago, the week of November 25 to December 1, will be known throughout the world as National Radio Week. For the first time in the short and exciting history of the Radio industry, every faction and party in the business is aligned behind a common purpose, Powell Crosley, Jr., chairman of the executive committee for National Radio Week, announced recently.

National Radio Week proposes to present to the public the very best in Radio in the very best possible manner. To insure the success of such a movement, the co-operation of practically every branch of this great industry, which is barely old enough to be recognized in some quarters, and yet, which extends to every part of the nation and into far distant quarters of the globe, had to be obtained.

Success of Week Assured

The thousands of Radio men who are backing the movement and the interest upon the part of the Radio public, assures the success of the week. Only in an industry of young men could this complete co-operation have been secured with so little delay. The younger generation has placed the Radio industry on its present high plane and the stabilization of the business has been accomplished more quickly than was the case in the automobile or talking machine trades.

A hearty response is reported from all the broadcasting stations, and they have indicated their willingness to follow the National Radio Week schedule of programs. Nearly five hundred firms and hundreds of publications are already behind the great movement for the Radio week.

HOT SPRINGS TO TELL IT TO WORLD BY AIR

Will Seek Speakers among the Celebrities at Resort

HOT SPRINGS, ARK.—N. H. R., the Nation's Health Resort, Hot Springs National Park, is to take the air! The Junior Chamber of Commerce here is behind the movement and will launch the biggest and most popular drive in the history of the resort this month. The entire proceeds will go toward providing Hot Springs with one of the best broadcasting stations in the United States.

After the station is put into service a message will be broadcast each evening at a definite hour to tell the world about Hot Springs. A special effort will also be put forth to have national celebrities who frequent the resort to send out messages. Concerts and other forms of entertainment at the hotels will be among the attractions offered Radiophans.

Hot Springs, when its plan goes through, will have established a precedent in having the first municipally owned broadcasting station in Arkansas and the only one owned by a Junior Chamber of Commerce in the United States.

YELLOW TIP MICROMETER ADJUSTING CRYSTAL DETECTOR

Increases the Efficiency of Your Crystal Set



FINER tuning, clearest possible reception, constant adjustment until you wish to change, then—"A Twist of the Wrist—It's Set." Excellent for reflex and other circuits. Write for folder and name of your nearest dealer. \$2

Dealers and Jobbers—Write for Attractive Proposition
WHOLESALE RADIO EQUIPMENT CO.
Exclusive Factory Representatives
35 William Street, NEWARK, N. J.

GIANTS-YANKEE SCORE HEARD AT WOODPILE



This "feller" doesn't need a friend, even though the woodpile kept him busy and he couldn't see the "world's serious" between the New York Giants and Yankees. You see the reason why, don't you? Fotograms Photo

Urges Pan-American Policy

WASHINGTON.—The Pan-Americans are planning to take a prominent place in world communication in the near future. The United States has led in organizing an Inter-American Communications Commission, and is now urging the adoption of a continental policy on all matters of electrical communication, including Radiotelegraph and Radiophone operation. The next session of the body will probably be held next spring in Mexico City.

Morrison



Loud Speaker

IF YOU ARE CRITICAL

ASK the man who is proud of his receiving set—who boasts of the wonderful reproduction free from long distance stations—ask him what Loud Speaker he uses and he will say, "Morrison." Today people want to hear their opera and their dance orchestra in clear, full tones entirely free of harsh noises.

Attach Morrison Loud Speaker to the tone arm of your

PHONOGRAPH

or use it with your

HORN

and you will be proud to entertain your friends with a real radio concert. Tones adjusted soft or loud by a turn of a little dial—no other adjustment necessary.

Sold under an absolute money-back guarantee. Order from your dealer or send direct to factory.

\$10.00

NICKEL PLATED MODEL
Complete with 5 foot cord

\$15.00

GOLD PLATED MODEL

Illustrated Catalog will be sent free on request

DEALERS

Morrison Loud Speaker is Radio's most popular merchandising unit. We have a plan to help you sell that many of the best dealers in the country are finding quite profitable. Wire us today.

Morrison Laboratories, Inc.
343 Jefferson Avenue, East, Detroit, Mich.

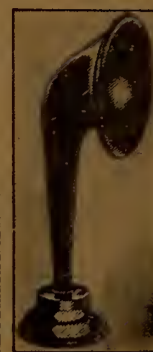
Cotton Pickers Stay on Job to Hear Radio

Plantation Community Center Has Complete Airphone Set

CLARKSDALE, MISS.—The typical Southern plantation has modernized itself as inventions and electric developments have brought improvements which could make even better the carefree life of the South. The latest development is the addition of complete Radio equipment on the plantation owned by John Bell Hood, near Jonestown, Miss. The plantation owner has erected a community center to house the Radio and provided a stage, dance floor and gallery.

A six-piece orchestra made up of negroes from the plantation takes turns with the Radio in the community meets held there. Every worker on the plantation is free to attend the Radio concerts and the plantation motion picture show which takes place in the same building. Out of 1,400 negroes employed on the plantation, known as "Matagorda" and consisting of 7,000 acres, not one has joined the hegira of negroes to the North.

Washington Dealers Organize
WASHINGTON, D. C.—Radio dealers here have recently formed an organization known as the Reliable Radio Dealers of Washington.



SPECIAL (IMPROVED MODEL) Direct From Manufacturer to Consumer LOUD SPEAKER

Genuine Wood Fiber Horn (With Unit and Cord)

Entirely eliminates that annoying metallic sound. Positively the only WOOD FIBER HORN on the market today. 10-inch Bell with Standard Attachment. Complete. Height 24 inches. Colors, Black, Mahogany and Olive Green.

Price \$8.00

(For a limited time only.)

Delivered to any part of the United States and Canada

EMIL DECLYNE

15 Park Row, Room 2525, NEW YORK CITY
Send M. O. or C. O. D. Dept. R. D., Barclay 6298

The New Grebe Broadcast Receiver



Point No. 2 A FOUR-TUBE RECEIVER in tubes—in any desired combination.

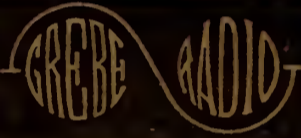
No storage battery unless you desire it.

Just One of its Seven Points of Satisfaction

Licensed under Armstrong U.S. Pat. No. 1,113,149

Ask Your Dealer

A. H. GREBE & CO., Inc.
Richmond Hill, N. Y.



RADIO AT N.Y. PRICES Daily Parcel Post

REFERENCES: R. G. Dun, Bradstreet, Coal and Iron National Bank, Corn Exchange Bank, New York City. No salvaged goods handled. Only standard brands in original packing, which bears our and the manufacturer's guarantee. Due to our tremendous output we can undersell any of our competitors. Send your order in today and insure prompt delivery.

HOW TO ORDER—Write your order plainly; state number, description and price of items wanted. Send Post Office or Express Money Order, personal check or bank draft.

WOOD CABINETS	
Highest grade Mahogany finish Cabinets. Hinged top. These cabinets are being sold at less than one-half regular value.	
C57 Wood Cabinet; panel size 7"x10". Each.....	\$2.50
C58 Wood Cabinet; panel size 7"x12".....	2.75
C59 Wood Cabinet; panel size 7"x14".....	3.00
C60 Wood Cabinet; panel size 7"x18".....	3.50
C61 Wood Cabinet; panel size 7"x21".....	3.75
C62 Wood Cabinet; panel size 7"x21".....	4.00

RADIO FREQUENCY TRANSFORMERS	
C70 Tri-coil for 201A or 301A tubes.....	\$1.95
C71 For 193, 299 or W.D.11 and 12 tubes.....	1.95
C72 Eria A31.....	3.75
C73 Eria A32.....	3.75
C74 Eria A33.....	3.75
C75 Eria Reflex.....	4.65

VARIOCOUPLER	
C77 High Grade 130 Deere Coupler made of Bakelite tubing wound with green silk wire. Special.....	\$2.65
C78 Variometer, same specifications.....	2.65

MISCELLANEOUS	
C163 Spagetti Tubing per yd.....	\$.09
C164 Synthetic Crystal.....	.30
C165 Ground Clamps.....	.17
C166 Black Rubber Binding Posts, 2 for.....	.06
C167 Nickel Plated Binding Posts, 2 for.....	.06
C168 No. 18 Annunciator Wire, half pound coil.....	.39
C169 6 ft. Phone Cord with Tips.....	.79
C170 20 ft. Extension Cord with Tips.....	1.95
C171 Wall Insulators, Porcelain.....	.05
C172 Tubular Porcelain Lead-in Insulators, 6-in.....	.10
C173 Belnartz Coil.....	1.45
C174 Cockaday Coil.....	2.42
C175 2 in. Dial and Knob.....	.25
C176 3 in. Dial and Knob.....	.35
C177 4 in. Dial and Knob.....	.49

1 1/2 VOLT DIETZEN TUBE	
Two-element Fleming valve effect; operates on one dry cell with or without "B" Battery; wiring diagram free with each tube.	
C95 Dietzen Tube.....	\$1.00
C96 Socket for Dietzen Tube.....	.40

BAKELITE TUBE SOCKETS	
Moulded of brown bakelite; Binding Post Connections.	
C99 Standard Type for 201A, 301A, W. D. 12.....	39c
C100 For U. V. 193, U. V. 299, Socket.....	39c
C101 For W. D. 11, C11.....	39c

Audio Frequency Transformers	
The following transformers are guaranteed standard makes, and will produce very efficient results.	
C83 Dietzen 3 to 1 Ratio.....	\$3.95
C84 Dietzen 5 to 1 Ratio.....	3.95
C85 Dietzen 10 to 1 Ratio.....	3.95
C86 Acme Audio.....	4.25
C87 Amertran.....	5.95
C88 U. V. 712 R.C.A.....	5.75
C89 U. V. 714 R.C.A.....	5.75

Loop Aerial	
C76. Can be assembled by anyone in five minutes; all wood parts, wire and binding posts included, complete.....	\$1.00

Standard Brand Head Phones	
C134 Brandes Superior.....	\$5.25
C135 Dictograph.....	\$6.75
C136 Baldwin Type "C" Double.....	\$9.85
C137 Baldwin Type "C" Single.....	\$4.95
C138 Western Electric.....	\$10.50
C139 Dietzen 3000 chms extra special.....	\$3.95

VARIABLE AIR CONDENSERS	
These condensers are made of heavy aluminum plates, high grade bakelite ends.	
C110 21 Plate .0005 Mfd.....	\$1.75
C111 11 Plate .0025 Mfd.....	1.25
C112 3 Plate .00005 Mfd.....	.85
C113 43 Plate .001 Mfd.....	2.25

Modells ESTABLISHED 1892
71 Cortlandt Street
NEW YORK, N. Y.
America's Greatest Radio Mail Order House
ELEVEN NEW YORK STORES

WOMAN RUNS CO-OP PLANT FOR 2 CITIES

IN HEART OF "LAND OF 10,000 LAKES"

Minneapolis and St. Paul Join Hands in Reopening WLAG with a New Slogan

By Vera Brady Shipman

A visitor from WDAP, Chicago, announced the other night over Station WLAG. He opened with "The Land of a Thousand Lakes" and when he was corrected, he said he didn't think there could be ten thousand lakes in the world. But there really are—not only in the world, or in the Northwest, but right within the borders of Minnesota. There are actually ten thousand lakes counted and named besides numerous too small for consideration. The WDAP visitor stands corrected and probably much abashed.

A visit to WLAG with its able woman director, Eleanor Poehler, was an interesting climax to a hundred-and-fifty-mile motor trip from my country place in upper Wisconsin.

With so many stations financed by newspapers, electric companies and a few individuals and colleges, a station with the co-operation of two cities is unique. It is a great advertising enterprise and with the Twin Cities co-operating for success, its publicity gains authority in the combine.

Reopen with New Slogan

WLAG opened September 14, 1922, as "The Call of the North" and was financed by Minneapolis concerns only. On August 1, 1923, St. Paul concerns took their places with the withdrawal and combining of certain Minneapolis subscriptions and the station, on 417 meters wave length, adopted the combined slogan of the ten thousand lakes. With equipment owned and operated by the Cutting and Washington Radio Corporation, a number of organizations subscribed for WLAG's financial support. Those from Minneapolis were the Minneapolis Loan and Trust and Northwest National Bank, L. S. Donaldson, Benzo Gas Company, Musingwear Corporation, and from St. Paul, the retailers' and jobbers' organizations, Brown and Bigelow Advertising Agency, and the Purity Baking Company.

The Northwest Farmstead, a Minnesota farm journal whose editor James Kelley

TWIN CITIES HAVE JOINT BROADCASTING PLANT



The Twin Cities get along nicely at their new co-operative broadcasting plant, WLAG. There is a studio in each city, from which programs are alternated. The managing director, Eleanor Poehler,

(In the circle) is an accomplished musician and is assisted by an able staff. The chief operating engineer is R. R. Sweet, and his first assistant C. W. Tuttle, shown at the right and left of the circle

and managers W. C. and H. H. Allen are progressive in ideas of Northwest publicity, each evening gives an hour of lectures for farm improvement. Some of these are given by the University of Minnesota faculty or under the university supervision.

Plan to Make New Orleans Radio Center of South

NEW ORLEANS.—The New Orleans Radio Association held a meeting at the Grunwald hotel recently, electing the following officers: Valdemar Jensen, president; C. E. Ammen, vice-president; H. E. Faller, secretary-treasurer, and Edward T. Jones, publicity chairman. Plans to make New Orleans the Radio center of the South were discussed, and resolutions to bring better and more frequent musical programs to fans listening in on the 1923-24 offerings from Crescent City broadcasting stations were passed.

Constant improvements are being made in the operating rooms. Chief operator R. R. Sweet and his assistant C. W. Tuttle are shown in the picture. Paul Johnson is chief announcer with frequent announcements by Eleanor Poehler, the director. The Minneapolis station is operated at the Oak Grove Hotel, in Minneapolis' residence section. Operating rooms, studio and office are on the sixth floor of the hotel.

The combining of the Twin Cities for one broadcasting station with studios in each city, from which they alternate programs, has found a happy solution for local rivalry. The broad spirit of both cities sponsors programs of varied inter-

est. Each subscriber has a part of the daily schedule. Musical programs are divided according to the time allotted each organization.

The managing director, Eleanor Poehler, is an accomplished musician and on the evening I visited WLAG, it was my good fortune to hear her sing on the midnight program.

A prize of \$500 is being awarded by Station WGY for the best Radio drama submitted during the three months' period ending December 1. The winning play will be sent into the air during the winter, when transmitting conditions are ideal for a large audience to hear it.

THE De Forest name has been in the forefront of radio research for twenty-three years. De Forest invented the three-electrode vacuum tube which makes present-day radio possible. The sets and parts made today by the De Forest Company are worthy of the De Forest name.

DE FOREST RADIO TEL. & TEL. CO.
Dept. R. D. 3 JERSEY CITY, N. J.

If Located West of Pennsylvania, Address

DE FOREST RADIO TEL. & TEL. CO.
Western Sales Division
Dept. R. D. 3 5680 12th St., DETROIT, MICH.



Cotogrip

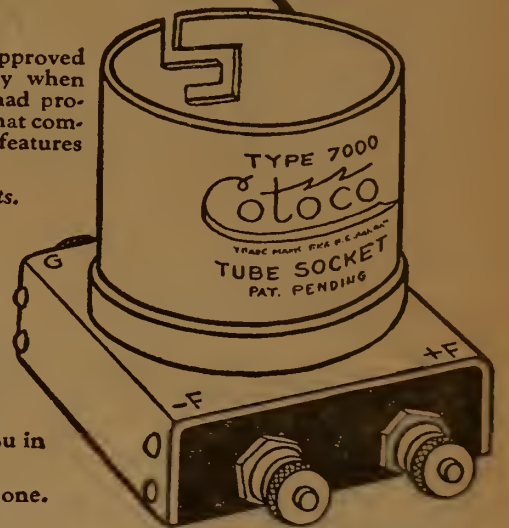
"Built First to Last"

This little beauty was approved by our engineers only when convinced that they had produced the one socket that combines all the essential features of a good socket.

1. Positive Cotogrip Contacts.
2. Hard Rubber Insulation.
3. Rugged Construction.
4. Compact Design.
5. Concealed Mounting.

It is impossible to show the unique mechanical action of Cotogrip contacts in a photograph. It is different from any other socket you have ever seen. This socket will interest you in every way.

You ought to have one.
Ask Your Dealer



PACIFIC COAST BRANCH:
329 Union League Bldg.
LOS ANGELES

COTO-COIL CO PROVIDENCE



UV-199

Radiotron UV-199 is a small tube—but 3½ inches high. But it is a tube of big performance—an excellent detector, audio and radio frequency amplifier.

It means economy—lives longer than other tubes—and draws but .06 ampere, filament current. Nothing like it for portable sets, because it can be used with little flashlight batteries.

Price
\$6.50

Radio Corporation of America

Sales Offices: Dept., 3002
233 Broadway, New York

10 So. La Salle Street, Chicago, Ill. 433 California Street, San Francisco, Cal.

Be sure the vacuum tubes you buy are marked Radiotron.

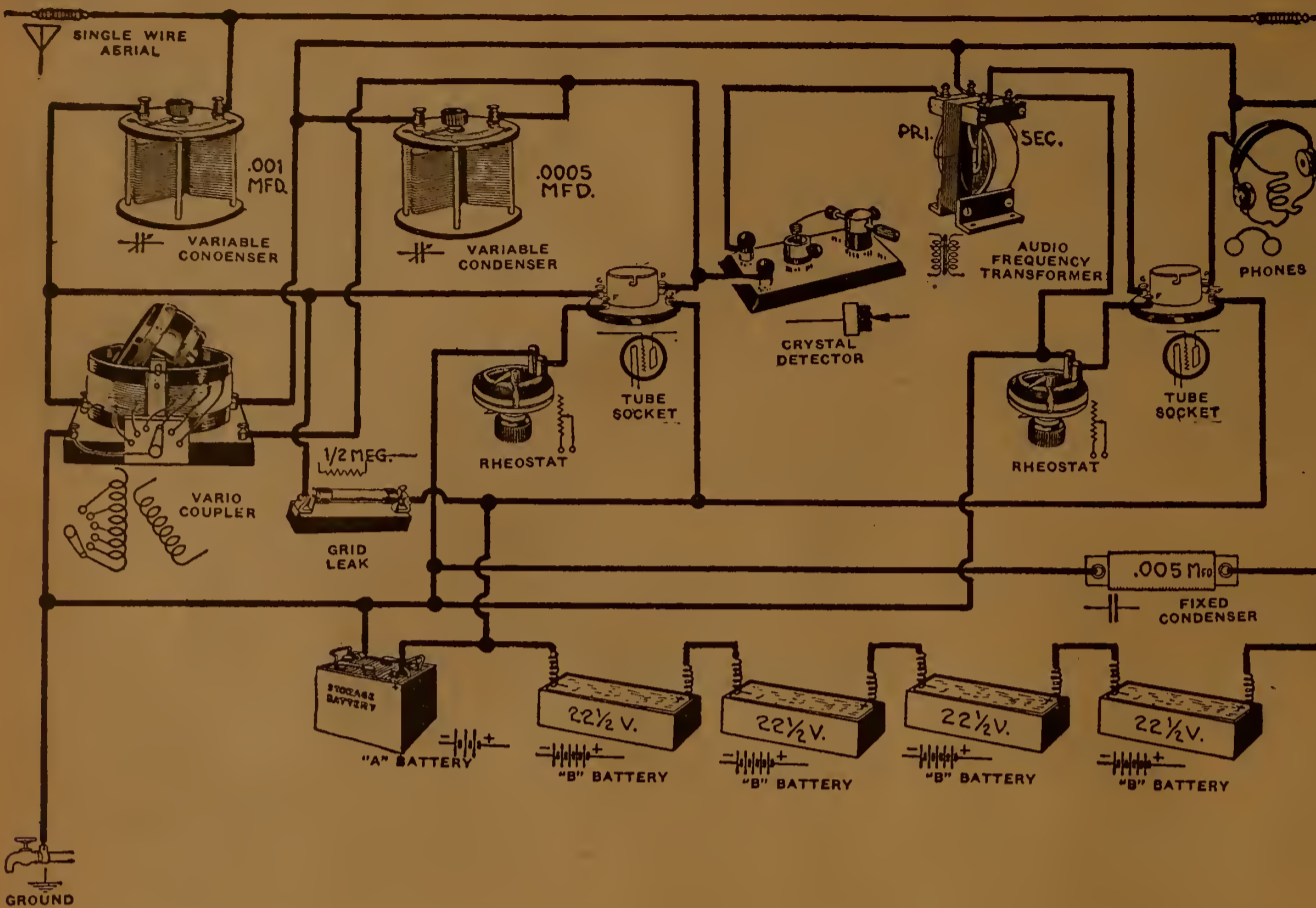


This symbol of quality is your protection

Radiotrons

REG U S PAT OFF

DOUBLE TUBE CIRCUIT IN SIMPLEX PICTURE FORM



THERE have been innumerable single-tube Reflex diagrams shown, but double-tube circuits have not been quite so numerous. The circuit shown is exceptionally simple for one of this type. In fact, if it wasn't for the crystal detector, we'd be accused of palming off a slight modification of a regeneration

type. It only goes to show the little difference that actually exists between regeneration and some of the Reflex type of circuits. A variocoupler and two variable condensers make up the tuning control and give very good selectivity. The condenser across the coupler rotor should be of the

vernier type. A by-pass condenser of .005 mfd. capacity is shunted across the A and B batteries. The plate batteries consist of four 22 1/2-volt units or their equivalent. A hard tube is required. The circuit gives good volume, and will give good distance results, but good aerial and ground connections are required.

Condenser Capacity Rating
The rating of variable condensers by the number of plates is not a satisfactory method of determining the capacity. This is apparent when we consider that the electrical capacity of two different commercial types of condensers having the same number of fixed and movable plates will differ considerably. The proper method of rating any condenser is by its capacity in microfarads, as determined by actual laboratory tests. —Peter J. M. Clute, Schenectady, N. Y.



Unequaled Clearness Thru a New Magnetic Principle of Construction

Distant and local broadcasting reproduced without distortion. Endorsed by Radio Experts—Lieut. Commander Reason, U. S. Navy says: "I use your headset in preference to others in experimental work."

Trial Offer If your dealer is out of "Repeaters" send \$5.00 and dealer's name for complete set subject to refund in full within 10 days if not perfectly satisfactory.

Moss-Schury Mfg. Co., Inc.
Radio Division
2011-2015 Franklin Street, Detroit, U. S. A.
Manufacturers of precision electrical devices

Semi-Indoor Aerial

There are many Radioplans who live in apartment houses and other places where an outdoor aerial cannot very well be employed. A very good way to overcome this difficulty is to replace the window screens with copper screening. At the corners of a screen frame tack a strip of rubber inner tubing for insulation. If more than one screen is used, connect them together and take the lead-in off the screen that is nearest the Radio set.

Fifty assorted flathead solid brass machine screws, nuts, washers, copper lugs, 50c. Eight initialed binding posts, set, 60c. Twelve nicked binding posts, 50c. All three items, \$1.50. RADIO LIST for stamp. All prepaid. Stamps accepted. Kladag Radio Laboratories, Kent, O.

FREE RADIO VACUUM TUBE SET



Receives 100 Miles or More
Send name and address. Learn HOW you can get a Vacuum Tube Radio Set **ABSOLUTELY FREE**
Write today for Free Radio Plan. **RELIABLE SALES CORP.**
454 Broadway, N.Y. City, Dept. 57

A vacuum tube regenerative set, using only one tube, will bring in signals from nearly the same distance as a set having an audio frequency amplifier. The ampli-

fier only serves to increase the strength of signals brought in by the detector tube.

FREE with every Purchase of \$10.00 and over, a small 22 1/2 V. B. Battery

- \$18.00 Westinghouse Rectigon Charger.....\$14.83
- 30.00 Music Master Loud Speaker..... 27.00
- 5.00 U. B. 199 Transformer, 6-1 ratio..... 3.25
- 2.00 Tri-Coil Reflex Transformer. (Specify tube used)..... 1.72
- Thordarson Transformer, low ratio..... 3.25
- High ratio..... 3.75
- 3/16" Dilecto XX Bakelite Panels at 2c square inch.
- 1/8" Dilecto XX Bakelite Panels at 1 1/2c square inch.
- 1/4" Dilecto XX Bakelite Panels at 3c square inch.
- Ritter K. D. Portable Loop, complete.. 1.00

- ADVANCE B BATTERIES**
- 1.75 22 1/2 V., Small..... .75
 - 3.00 22 1/2 V., Large..... 1.45
 - 4.25 45 V., Small..... 2.00
 - 5.50 45 V., Large..... 2.90
 - Aerial Wire, 7 Strand, Tinned Copper, 100 ft. Cols..... .60
 - 5.00 13 Plate Vernier Condenser..... 2.85
 - 6.00 23 Plate Vernier Condenser..... 3.50
 - 6.50 43 Plate Vernier Condenser..... 4.00
 - 7.00 Pioneer Moulded Bakelite Variocoupler 4.95
 - 6.50 Pioneer Moulded Bakelite Variometer.. 4.85

Only money orders accepted; must include postage. Our merchandise is guaranteed by the manufacturer and is of the highest quality.

Send for monthly price list.
MARVEL RADIO SPECIALTY CO.
132 Nassau Street New York City, Dept. R. D.

ACOUSTICALLY CORRECT!



The Trimm extra large Loud Speaker unit with its wonderful ADJUSTO instantly regulating loud speaker to signal strength insures greatest volume without flaws or distortion. At three prices:

Acousticola STANDARD MODEL
With non-metallic horn, 21 1/2" high; bell 10" diam. **\$22.50**

Acousticola Grand
with solid cast aluminum horn the world's finest loud speaker **\$35.00**

ACOUSTICOLA Phonograph Attachment **\$10.00**

TRIMM HIGH GRADE HEADSETS

"PROFESSIONAL" model-3000 ohms **\$7.65**
"DEPENDABLE" model-2400 ohms **\$5.00**

Any Trimm product shipped and sold on approval and Guaranteed FOR LIFE. Write for descriptive folders. Mention your dealer's name.

TRIMM RADIO MFG. COMPANY
Dept. 54, 24-30 S. Clinton St. CHICAGO, ILL.

NAZELEY'S

PORTENA

FOLDING LOOP
(PATENT PENDING)

SPREAD, 28 INCHES
GENUINE BAKELITE FACINGS
85 FT. GREEN COVERED WIRE
MOROCCO FINISHED CASE

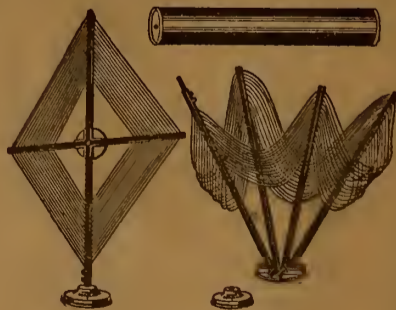
Practical—Efficient—Perfect

RICH MAHOGANY FINISH

FOLDS UP LIKE AN UMBRELLA; WORKS LIKE A CHARM

In individual Morocco covered Tube **List \$7.00 Each** One dozen to a Case

J. NAZELEY CO., 571 Hudson St., New York City



Further Details of the Famous Miloplex Hook-Up

Part VII—One Theory on the Operation of the Set

By the Mystery Man

FAR be it from me to criticize cooks, and to that I add Radio engineers; both are as temperamental, as fussy about their calculus and trigonometry, their B. T. L.'s and what's what, as a tin soldier with a rusty gun. They just won't agree or positively say, and yet out of the swarm of theories relative to the Plexy that have reached me, there is a sameness in thought that clearly indi-

would bring my cook back. Stretch—say, I've now stretched it until I'm afraid it will rip the casing. Merely, if I stretch it any more I'll have to touch the editor for a rubber hat.

But way back among the records in the archives of Radio comes quite a plausible theory from my good friend and counsel Harry Marx, Radio Digest's Technical Editor, who most modestly asks me to distinctly understand his version as but a theory, sort of f. o. b. as it were, subject to change without notice. Just like a shirt, you know, one is supposed to ask permission before publication, but his phone was busy. No, that wasn't the reason; the true story is I got the wrong number and Mabel answered—curses, I always did get house, car license and telephone numbers mixed up and besides one shouldn't park more than an hour on a phone line.

Now get this, it's a thinker. Mr. Marx, says "A circuit consisting of an inductance and capacity, will, when energized from a source, oscillate at a particular frequency dependent upon the values of such inductance and capacity; if either of the two are variable, then the value of the frequency is variable." That's what he said, but read it again and note particularly that Mr. Marx specifically states "when energized from a source," because he carries on amplifying this basic thought through introducing another most interesting statement, which follows as his second assumption, his first being omitted temporarily.

"The second assumption is that as the separate oscillating circuit is capable of adjustment to a distinctly lower or higher frequency than that of the primary, it is well within reason to believe that a heterodyning effect can be and possibly is produced, the altered frequency being superimposed upon the incoming wave, and as the oscillating circuit is totally flexible both in capacitance and inductive relation to the stator, then through proper adjustment the highest efficiency of circuit adjustment is possible, resulting in a volume and selectivity far surpassing that of a normally controlled circuit." And I'm going to be just tattle-tale enough to let him read that "them's my sentiments" until proved otherwise; besides haven't three of those research fellows told me the same thing.

But what does it all mean? Not a varying frequency, although the circuit does

vary and start "souping" if one's adjustments slip into low gear, but you can't—neither can I—hold it on a varying frequency. If we could we would have a true super-regenerator, and never having met a varying frequency "face to face," I hesitate to tell it to "be good" when it sticks its nose into the Plex. Well, I ask again, what is it all about? You get an inch or two nearer to true resonance, the greatest atomic active force existent for space annihilation.

It's that wonder of wonders, the invisible power which caused you and me as "kids" to get an immediate answer when we hollered down the well, four letters long, wide and high, and yet to each of us whether we be six or sixty, ever mysterious, "an echo."

If you or I know how to listen when it's going or coming; if we can but arrange a device that will synchronize perfectly with the incoming wave, or should I say, the passing wave, I would hesitate to assume how very little power it would require to transmit and receive a signal across the continent. You among my readers who understand the theory of operation of the synchronous motor quite appreciate the goal I have been striving for in King Miloplex, fully realizing that this so-called fourth or oscillating circuit is not far from being related to the basic theory of the synchronous motor, and while it is my intention to present the views of others, ever searching for a theory that can be substantiated by proof positive, not accepting either Mr. Marx' explanation or others which will follow, yet most appreciative to him and glad to say that it possesses much of logical reasoning, I cannot pass without notice those who have offered criticism. It may

interest them to learn that such letters interest me most, as it is from constructive criticism only that any good can be derived, destructive criticism being mostly ignored because the critics often write first and think afterward. But to you—whose number so many—that are offering suggestions for improvement I am indeed grateful.

Many are asking, can they use this or that tube, this or that battery. Use anything you like, the Miloplex isn't fussy; in fact, its outstanding feature is that an eight-year-old boy can build it and it will at least say "Hello, Kid!" for him. But it is a stickler for good parts. "As ye sow, so shall ye reap"; if you want better, build better. Good, yes, excellent parts are made, but you have to hunt for them.

However, let us drop back into a further discussion of Mr. Marx' theory by going a step farther. Many ask me if my oscillating circuit is not in reality a rejector circuit, an acceptor circuit, or a wave trap? I am believing all these questions are asked because, in principle, it is identical mechanically with the above, and it's somewhat like the girl who "was what she was dressed." Technically, and omitting its location relative to the balance of the Miloplex, it is in reality a tuned Radio frequency circuit, and nothing more. Then visualize, if you will, your primary with its condenser and aerial with ground completing another with the broadcasting station eliminated from consideration. In practice, if it is possible to adjust each of these circuits to synchronism with closely allied frequencies, then the product of the two will produce a third; or to pos-

(Continued on page 20)

THE MYSTERY MAN

Dear Sir:

In the September 29 issue of Radio Digest you gave a hook-up of the Miloplex circuit. I didn't pay any attention to it at the time, but when you came out with the October 6 article I sat up and took notice. Then I started to work and to say I got results is putting it rather mildly—but more about that later.

I used a fiber panel, a home-wound variometer, a B battery nine months old, and started in; couldn't get anything at first but a lot of humming and laid it to a 33,000-volt line across the street. After about 10 minutes of this I started looking around for trouble in the set, and I found out it will not work if the B— is connected to the A—. After this change it started to cut up something awful; don't know what it did, but it did anyway.

You can't make a "bug" quit, so I kept right on. Last night I put one stage of amplification with it and got—you say what! Oh, yes, the following: KSD, WFAA, WOAQ, KYW, WDAQ, WOS, WLAG, WMAQ, WGY, WHB and Zion City, Ill., some of them so loud I could hear them 10 feet away.

What we need in the set is a tuner that is not so critical, the variometer works so fast I can't catch them fast enough to hold them. Now, Mr. Editor, please see that he does this, let's make him work. Respectfully,

J. W. Lickiss.

icates few if any care to digress from precedent. But their unusual interest still remains; all are "cutting and trying," so I guess the soldering iron and pliers will win. The harmonics of a "pin stuck" baby cannot be defined or expressed in equations. I opine, then, that the gentleman who addressed me in perfect German script with an 800-word thesis on the Miloplex theory will pardon my not having received but a marking of 40 in German; therefore, I can only unknowingly admit that his theory is unquestionably correct, if he said what I think he said. The Bureau of Scriptology is now dissecting it, the patient may die, but I hope the operation will prove a success.

Another very considerate fan frankly tells me that I only need to stretch my imagination in order to get the correct Miloplex theory; that's what I thought



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Story of "Lucia" on KYW November 10

THE theme of this opera, written by Salvatore Camerano, was taken from Sir Walter Scott's novel, "The Bride of Lammermoor, and became a great Italian opera through the genius of an Italian, Gaetano Donizetti, who was himself of remote Scottish ancestry. The opera was first produced in Naples, almost a hundred years ago.

The scene is laid in Scotland during the seventeenth century. Briefly, it is the story of a cruel brother, Henry Ashton of Lammermoor, who plans to marry his sister, Lucia, to a man she does not love, in order to repair his fortune and better his political position. To gain his end he forges a letter from the lover, Sir Edgar of Ravenswood, in which he insinuates that the latter has married while in France. Just as Lucia, goaded to despair, has signed the marriage contract with Lord Arthur Bucklaw, Edgar appears and denounces her. Overcome with grief Lucia kills her husband while the wedding guests are still making merry. When she recovers her mind, the horror of her deed overwhelms her and she soon dies. Edgar wandering in the graveyard of his ancestors, hears the death bell tolling, and knowing that Lucia has remained faithful to her love, falls on his sword and dies.

Tuesday, November 6

CKAC, Montreal, Canada (Eastern, 430), 7:00 p. m., Kiddies' stories in French and English; 7:30, Popular selections, La Presse Orchestra; 8:15, French concert, Raoul Fenat, director.

KDKA, E. Pittsburgh, Pa. (Eastern, 326), 6:15 p. m., Dinner concert, Grand Symphony Orchestra; 7:30, "See with the Eyes of Youth," Dr. A. Goldstein; 7:45, "With the Deep Woods Lady," 8:00, Special service, Shadydale Presbyterian Church, Tenth Anniversary of the Pastorate of Dr. Hugh T. Kerr; Dr. Charles R. Brown, Mrs. Christine M. Clemson, soloist; 9:15, Concert, pupils of Joseph H. Moore, Margaret Waring, pianist; Marion White, pianist; Prof. W. Trinks, Mrs. W. Trinks, soprano; Harold Trinks, violinist; Mrs. Albert Young, soprano; Blanche Alstrom, violinist; Robert J. Dods, violinist; Richard J. Bozel, Jr., saxophonist; Margaret Dryan, pianist.

KFI, Los Angeles, Calif. (Pacific, 469), 8:45-7:30 p. m., Gage Christopher, bass; 10:00-11:00, Zoellner Quartet.

KGW, Portland, Ore. (Pacific, 492), 3:30 p. m., Jeanette P. Cramer; 8:00, Talk for farmers, Paul Y. Marie; 10:00, Dance music, George Olsen's Metropolitan orchestra.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Concert; 2:30-3:30, Matinee musicale; 6:45-7:30, Children's program; 8:00-10:00, Program arranged, Gertrude M. Gony, soprano; contralto; William F. Alder's "Tours de Luxe," 10:00 to 12:00 p. m., Art Hickman's Orchestra.

KSD, St. Louis, Mo. (Central, 546), 8:00 p. m., Hayden Quartet; Addresses by Charles A. Stookey, Jr., A. B. Crowder, Jr.; 11:00, Dance music, Silverman's Orchestra.

KYW, Chicago, Ill. (Central, 536), 11:35 a. m., Table Talk, Mrs. Anna J. Peterson; 6:50 p. m., Children's bedtime story; 8:01, Farm program; "Orderly Marketing of Live Stock," John G. Brown; "A Bottle of Milk," E. B. Heaton; 8:30, Chicago Music College; 9:30, Hubie Miller, pianist; A. W. "Sen" Kane, specialty act.

WBAP, Fort Worth, Texas (Central, 476), 7:30-8:30 p. m., Wilbert Brown, violinist; 9:30-10:45, Casino Novelty Four Quartet.

WBZ, Springfield, Mass. (Eastern, 337), 7:30 p. m., Twilight tales for the Kiddies; Household Management Course, Agnes H. Craig; 8:00, Alfred Troemel, violinist; Mrs. Ruby T. Kingley, pianist; Pupils of the Springfield Conservatory of Music; 9:00, Bedtime Story for Grown-ups, Orson S. Marden.

WDAP, Chicago, Ill. (Central, 360), 1:40 p. m., Concert, Drake Concert Ensemble and Blackstone String Quintet; 7:00, Drake Concert Ensemble and Blackstone String Quintet; 10:00, Frederick W. Agard, tenor; Bob Cougle, pianist; Jack Chapman's Orchestra.

WDAR, Philadelphia, Pa. (Eastern, 395), 12:00-12:54 p. m., Organ recital, Stanley Theater; Piano solos, Edna Finestone; 2:00-3:00, Concert, Arcadia Cafe Concert Orchestra; 4:45-5:00, Song recital; 7:30-7:45, Bedtime stories, Dream Daddy; 7:45-8:00, Dramatic Review, Walter Greenough.

WDT, New York, N. Y. (Eastern, 405), 12:00-12:45 p. m., Fred Whitehouse Song Revue, All Star Broadway attraction.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., Address, DeWitt McMurray; 8:30-9:30, Mozart Choral Club, Earle D. Behrends; 11:00-12:00, Hedley Cooper and assisting muellelans.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 3:00, Short talk; 6:30, Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 7:00-7:30, Children's Own Half Hour Stories, Cousin Sue; 9:00, Radio play by WFI players.

WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1:00 p. m., George Albert Bouchard, organist; 6:30-7:00, Vincent Lopez Hotel Statler Dance Orchestra; 7:00, Digest of the day's news; Topics of scientific interest.

WGY, Schenectady, N. Y. (Eastern, 380), 2:00 p. m., "Reducing the High Cost of Dinner Parties," 7:45, Program, Eugene F. Perry & Co., "A Few Moments with New Books," L. L. Hopkins; Olive Wentworth, soprano; Harry Arnold, baritone; Elizabeth Weatherlee, violinist; Arch Batty, tenor; "The Story of Glove Making," J. E. Stille; Lelah Abrahams, harpist; Hazel Scoville, contralto.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Selections, Strand Theater Orchestra; "Just Among Home Folks;" Selections, Alamo Theater organ; 7:30-9:00, Ray Pfaff and his orchestra; Reading: An Interesting Historical Episode.

WHN, New York, N. Y. (Eastern, 360), 2:15-2:30 p. m., Anna Stump, classical pianist; 9:45-10:15, Charles Hathaway's Orchestra; 10:30-10:45, Ruth and Janet Meyer, jazz pianist and jazz singer; 11:00-11:30, Shapiro Bernstein Music Co.; 11:45-12:00, Charles Bourne, jazz pianist.

WIP, Philadelphia, Pa. (Eastern, 509), 1:00 p. m., Organ recital, Karl Bonawitz; 3:00, Song recital; 7:00-7:30, Bedtime stories, Uncle Wip; 8:00, Dramatic review; 8:15, Song recital.

WJAX, Cleveland, Ohio (Eastern, 390), 7:30 p. m., Concert, Cleveland News-Leader; 7:30-7:45, Bedtime story, E. C. Johnson; 7:45-10:30, Popular dance program, Wylie's Orchestra.

WJAZ, Chicago, Ill. (Central, 447.7), 10:00 p. m.-2:10 a. m., Barbara Sands, soprano; Alfred Heath, baritone; Frank Aulback, pianist; Amanda C. Burhop, pianist; Jennie M. Navigator, soprano; Leiber Spalding, soprano.

Tuesday, November 6



Miss Eunice R. Randall sends thousands of WGI's youngsters to the Land of Nod. Hear her Tuesday and Thursday nights

Miss Anna Ludmila, premiere danseuse for the Chicago Civic Opera, will dance but won't be heard Saturday night over KYW

WJZ, New York, N. Y. (Eastern, 455), 3:00-3:50 p. m., Wanamaker Concert; 3:50-4:00, "Home Beautiful," Dorothy Walsh, interior decorator; 4:00-4:15, Irving Schiff, boy soprano; 4:15-4:40, Recital and Poems, Clyde Monroe; 4:40-5:40, "Revue," by Irvin Ghee; 6:00-6:30 p. m., The Macmillan Co.; 7:30-7:45, Herbert Clair, popular pianist; 7:45-8:00, University of the Air, "Advertising," Elton G. Pratt; 8:00-8:15, "Broadcasting Broadway," Bertha Bralnerd; 8:15-8:50, Margaret Manierre Brown, soprano; 8:50-9:00, "Blquette," Doubleday Page Co.; 9:00-9:35, Phyllis Krauter, cellist; 9:35-9:55, "Harding's Last Day in Alaska," Joe M. Chappin; 10:00-10:30, Darl Bethman, baritone; 10:30-11:30, Hotel Astor Grill Orchestra.

WLW, Cincinnati, Ohio (Central, 309), 3:00 p. m., Music, Jennie Keht; 10:00, Artistic program: Rose Boden, soprano, director; Edythe Tolken, Bessie Muldoon, violinists; Neta H. Strickman, contralto; Arnold Schroeder, baritone; Constance Cochower, accompanist.

WMAQ, Chicago, Ill. (Central, 447.5), 4:30 p. m., Program Pupils Glenn Dillard Gunn School of Music; 7:00, "Jamie," Heron—Robert W. Service; program; Program, Chicago Consulate of Norway; 9:15, Weekly program, Lyon & Healy.

WOC, Davenport, Iowa (Central, 484), 12:00 m., Chimes concert; 3:30 p. m., A. G. Ilirnic, lecturer; 5:45, Chimes concert.

WOD, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Organ recital, Mary E. Vogt; 12:00-12:55 p. m., Luncheon music, Wanamaker Crystal Tea Room Orchestra; 4:45-5:00, Organ recital, Mary E. Vogt.

WOR, Newark, N. J. (Eastern, 405), 3:00-3:30 p. m., "Half Hours with Successful Women," Baroness Katharine von Klennner will speak on "Women in Opera"; 6:30-7:00, Man in Moon Story for Children; 7:15-7:30, Arthur Flecher playing 1 string violin.

WWJ, Detroit, Mich. (Eastern, 517), 9:30 a. m., "Tonight's Dinner," Woman's Editor; 9:45, "Ironing Day," program, Fred Shaw, Marjory Richmond; 3:00 p. m., Detroit News Orchestra; 8:30, Detroit News Orchestra; Madame Homer Dubard.

Wednesday, November 7

KDKA, E. Pittsburgh, Pa. (Eastern, 326), 7:00 p. m., Dinner concert, Pittsburgh Athletic Association Orchestra; 7:30, Literary period; Children's period; 8:15, Testimonial dinner, Turtle Creek Valley Post American Legion; Address, Judge Landis, Hon. M. Clyde Kelly, Mayor Magee.

KFI, Los Angeles, Calif. (Pacific, 469), 8:45-7:30 p. m., Nick Harris Concert Co.; 10:00-11:00, Agnes Woodward, Director California Whistling School.

KGW, Portland, Ore. (Pacific, 492), 3:30 p. m., Children's program, Inez Caplan, pianist, Aunt Nell; 8:00, Rybka atrine orchestra; 9:00, Business talks, Alexander Hamilton Institute; 10:00, Dance music, George Olsen's Metropolitan Orchestra.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Concert program, 2:30-3:30, Matinee musicale, 6:45-7:30, Children's program, Master Louis Pella, age 11 years; accompanist; 8:00-10:00, Virginia Flohr, soprano; 10:00-12:00, Art Hickman's Orchestra; Ethel R. Brown, lyric soprano.

KSD, St. Louis, Mo. (Central, 546), 8:00 p. m., Aberg's Concert Ensemble; Arne Arnesen, violinist; 11:00, Dance music, Rodemich's Orchestra.

KYW, Chicago, Ill. (Central, 536), 11:35 a. m., Table talk, Mrs. Anna J. Peterson; 6:50 p. m., Children's bedtime story; 8:00, Sherwood School of Music; Wendolynn Llewellyn, pianist; Valletta Hanneman, violinist; Kathryn Llewellyn, soprano; Herbie Mintz, pianist; Sallie Menkes, contralto; 9:05, Reviews of the latest books, Llewellyn Jones.

PWX, Havana, Cuba (Eastern, 400), 8:30-11:00 p. m., National and foreign music, Municipal Band.

WBAP, Fort Worth, Texas (Central, 476), 7:30-8:30 p. m., Mrs. Pearl Calhoun Davis, soprano and pupils; 9:30-10:45, George Freeman's Sooner Serenaders, Texas Hotel Orchestra.

WBZ, Springfield, Mass. (Eastern, 337), 8:00 p. m., Dinner concert, WEZ Quintet; "Electric Capacity," Edward H. Goodrich; 7:30, Twilight tales for the Kiddies; "What the Industrialists Are Doing on Accident Prevention," Harold T. Martin; Bedtime story for Grown-ups, Orson S. Marden.

WDAP, Chicago, Ill. (Central, 360), 1:40 p. m., Concert, Drake Concert Ensemble and Blackstone String Quintet; 7:00, Drake Concert Ensemble and Blackstone String Quintet; 10:00, Salvation Army Staff Band; Jack Chapman's Orchestra.

WDAR, Philadelphia, Pa. (Eastern, 395), 12:00-12:54 p. m., Organ recital, Stanley Theater; dinner music; 2:00-3:00, Concert, Arcadia Cafe Concert Orchestra; 4:45-5:55, Short talks and concert; 7:30, Bedtime stories, Dream Daddy; 7:45, Short talk; 8:00 p. m., Dance music, Howard Lanin's Arcadia Cafe Dance Orchestra, Special WDAR features.

WDT, New York, N. Y. (Eastern, 405), 12:00-12:15 p. m., Fletcher Henderson's Vocalian Orchestra; 12:15-12:30 p. m., Hazel Meyers; 12:30-12:45 p. m., Maud Mills; 7:00-7:15 p. m., Stage and Screen, Charles Reed; 7:30-7:45 p. m., Madame Waldo Downey, World's Famous Whistler; 7:45-8:00 p. m., Witmark Program of old-time songs.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., Address, "Slimmering in Summer While Studying Psychologically," D. J. P. Comer.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 3:00, Song recital; 6:30, Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra.

Thursday, November 8

CKAC, Montreal, Canada (Eastern, 430), 7:00 p. m., Kiddies' stories in French and English; 7:30, Concert, Knights of Columbus entertainers and orchestra, Lafontaine lodge, Armand Renault, director.

KDKA, E. Pittsburgh, Pa. (Eastern, 326), 6:15 p. m., Dinner concert, Grand Symphony Orchestra; 7:15, "Famous Violins in America and Abroad," G. M. Francois, violin maker; 8:45, "Uncle Remus" has a story for the children; 8:15, Farm program, Frank E. Mullen; 8:30, Concert, KDKA Little Symphony Orchestra; Clara Huyn, soprano; Rose Leader Wahllett, contralto; Roy Strayer, tenor; George Wahl, baritone; 11:00 Midnight Frolic.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., Reed; 7:30-7:45 p. m., Madame Waldo Downey, World's Famous Whistler; 7:45-8:00 p. m., Witmark Program of old-time songs.

KGW, Portland, Ore. (Pacific, 492), 12:30-1:15 p. m., Child Training program; 8:00 Dramatic program, J. Addison Hunter; 10:00, Dance music, George Olsen's Metropolitan Orchestra.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Concert; 2:30-3:30, Matinee musicale; 6:45-7:30, "Uncle John," 8:00-10:00, Fuhrer String Quartet; "Methods of Science," Professor John C. Shedd; 10:00-12:00, Art Hickman's Orchestra.

WCR, Buffalo, N. Y. (Eastern, 319), 12:30-1:00 p. m., George Albert Bouchard, organist; 12:30-1:00 p. m., Vincent Lopez Hotel Statler Dance Orchestra; 7:00, Digest of the day's news; 9:30, Concert; 11:00, Vincent Lopez Hotel Statler Dance Orchestra.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Selections, Strand Theater Orchestra; "Just Among Home Folks;" Selections, Alamo Theater organ; 7:30-9:00, Concert, Mrs. Jane Webster Murrell.

WHN, New York, N. Y. (Eastern, 360), 2:15-3:00 p. m., Clover Gardens Orchestra; 8:00-8:15, Sarah Stewart Bowne, mezzo-soprano; 8:45-8:55, Agnes Macpeake, soprano; 9:00-9:10, Augusta Strangfeld, soprano; 9:15-9:45, Program, Edw. B. Marks Music Co.; 10:00-10:10; Jimmie Clarke in popular songs; 10:10-10:30, Program, Irving Berlin Music Company, 11:30-11:40, St. Jay Kaufman of the N. Y. Telegram.

WIP, Philadelphia, Pa. (Eastern, 509), 3:00 p. m., Dance music; 6:02, Dinner music, Dick Regan's WIP Little Symphony Orchestra; 7:00-7:30, Bedtime stories, Uncle Wip.

WJAZ, Chicago, Ill. (Central, 447.7), 10:00 p. m.-2:00 a. m., Sherwood School of Music's Orchestra.

WJZ, New York, N. Y. (Eastern, 455), 3:00-3:20 p. m., Lina Scott Jeffcott, dramatic soprano; 3:45-4:00, Antoinette G. Halstead, contralto; 4:15-4:20, Antoinette G. Halstead, contralto; 4:30-5:40, Hotel Commodore Orchestra; 6:00-6:30, Florence Smith Vincent, "Potter in Shadlowland Stories;" 7:30-7:45, Cafe Boulevard Orchestra; 7:45-8:00, Review of Reviews; 8:00-8:15, Cafe Boulevard Orchestra; 8:15-8:30, Jack Snyder Music Co.; 8:30-8:45, Ellis Ebeling, soprano; 8:15-9:00, Mayor Hylan's Peoples' Concert; 9:00-9:15, Ellie Ebeling; 9:15-9:30, "Winter Foods for Body Fuel," Anne Lewis Pierce; 9:30-10:30, Anna Pinto, harpist; 10:30-11:30, Mayor Hylan's Peoples' Concert.

WLW, Cincinnati, Ohio (Central, 309), 8:00 p. m., Concert, First Presbyterian Orchestra, George R. Myers, directors; Arthur Graefenhan, saxophonist; Mrs. Opal Warring Denman, accompanist; Florence M. James, violinist; 9:15, "An Evening of Violins," auspices of College of Music of Cincinnati; Fiddle talk, Adolf Hahn; Ruth Morris, William Stees, William M. Keller, Amy Jonap, violinists; Orchestra of violins.

WMAQ, Chicago, Ill. (Central, 447.5), 4:30 p. m., Program, Cosmopolitan School of Music and Dramatic Art; 7:00, George Faulkner, the Story Lady stories; 9:15, Program, Thomas A. MacBurney, vocal teacher.

WOC, Davenport, Iowa (Central, 484), 12:00 m., Chimes concert; 3:30 p. m., Clyde G. Kern, lecturer; 6:30, Sandman's visit; 7:00, Scott County Farm Bureau; 7:00, Pipe organ recital, Ervin Swindell; Helen Peterson, mezzo-soprano; 10:00, Artists from LeCrosse, Wisconsin; Grace McElinden, soprano; Elizabeth George, pianist; Rudolph Kvelve, violinist.

WOD, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Organ recital, Mary E. Vogt; 12:00-12:55 p. m., Luncheon music, Wanamaker Crystal Tea Room Orchestra; 4:45-5:00, Organ recital, Mary E. Vogt; 7:45, Dinner music, Adelphi Hotel Orchestra; 8:30, Song recital and humorous monologue, Ralph Bingham.

WDR, Newark, N. J. (Eastern, 405), 2:45-3:05 p. m., Essex Dance; English Actress in a Duologue, "Florette and Chloe," 3:15-3:45, One-act French play, Grand Guignol Players, Frolic Theater; 6:15-6:30, Frank Shackelford, tenor; 6:30-6:45 p. m., "Radio for the Layman," Albert Sonn; 6:45-7:00, Frank Shackelford, tenor; 8:00-8:15, Winifred Ridde, soprano; 8:15-8:30, Michael Lambert, cellist; 8:30-8:45, Winifred Ridde, soprano; 8:45-9:00, Arthur Murray, talk on dancing lessons to begin Nov. 14; 9:00-9:15, Michael Lambert, cellist; 10:30-11:00, Dawson Olivier Entertainers.

WTAM, Cleveland, Ohio (Eastern, 390), 8:00 p. m., Orchestral numbers, WTAM Orchestra; Piano solo, Miss Sharp, violin solo, Ben Silverberg; Miss Sharp, accompanist; Piano solo, Alice C. Goudy; Herbert A. Smith, tenor; George Lees, accompanist; Cello solo, Max Schmidt; Vocal solo, Dorothy L. MacIntosh; Mrs. Blanche Hankison, accompanist; Piano solo, Aileen C. Goudy; Vocal solos, Herbert A. Smith; George E. Lees, accompanist.

WWJ, Detroit, Mich. (Eastern, 517), 9:30 a. m., "Tonight's Dinner," Woman's Editor; 3:00 p. m., Detroit News Orchestra; 8:30, Detroit News Orchestra; Vocal selections, pupils of Mrs. Blanche Lyons.

Left is A. who will ring the opera. He will be as is Virgilio

KYW, Chicago, Ill. (Central, 536), 11:35 a. m., Table Talk, Mrs. Anna J. Peterson; 6:50 p. m., Children's bedtime story; 8:00, Twenty Minutes of Good Reading, Rev. C. J. Perrin; 8:20-9:20, Herbie Mintz, pianist; Sallie Menkes, pianist; A. W. "Sen" Kane, specialty act; Lucille O'Brien, soprano; Hilda Butler Farr, pianist.

PWX, Havana, Cuba (Eastern, 400), 8:30-11:00 p. m., Dance program, Antonio M. Romeu's Orchestra.

WBAP, Fort Worth, Texas (Central, 476), 7:30-8:30 p. m., Concert, Fort Worth artists; 9:30-10:45, True's Trio Toners Orchestra.

WBZ, Springfield, Mass. (Eastern, 337), 7:00 p. m., Letter from the New England Homestead; 7:30, Twilight tales for the Kiddies; "Story Openings and Endings," Dr. J. Berg Esenwein; 8:00, Concert, Mrs. C. D. Reed, soprano; Mrs. Howard A. King, accompanist; 9:00, Bedtime story for Grown-ups, Orson S. Marden.

WDAP, Chicago, Ill. (Central, 360), 1:40 p. m., Concert, Drake Concert Ensemble and Blackstone String Quintet; 7:00, Drake Concert Ensemble and Blackstone String Quintet; 10:00, Hugh B. Marshall, tenor; Jack Chapman's Orchestra.

WDAR, Philadelphia, Pa. (Eastern, 395), 12:00-12:54 p. m., Organ recital, Stanley Theater; dinner music; 2:00-3:00, Concert, Arcadia Cafe Concert Orchestra; 4:45-5:55, Piano recital, Edna Finestone; 7:30-7:45, Bedtime stories, Dream Daddy.

WDT, New York, N. Y. (Eastern, 405), 12:00-12:15 p. m., Doro White; 12:15-12:45 p. m., Frank Goodman, Willie White, Billie Frish, Will Donaldson.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., "Facts About Dallas," representative of Dallas Chamber of Commerce; 8:30-9:30, Aida Choral Club.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 3:00, Short talks; 6:30, Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 7:00, Bedtime stories, Cousin Sue; 8:00, Boy Scouts Radio Corps; 9:00, Piano solos, Loretta Kerk; Dance music, Meyer Davis Bellevue Stratford Dance Orchestra.

WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1:00 p. m., George Albert Bouchard, organist; 6:30-7:00, Vincent Lopez Hotel Statler Dance Orchestra; 7:00, Digest of the day's news; Boy Scout Radiogram; Employment bulletin; Story from "The American Boy" magazine; 9:00, Musical program, Greater Buffalo Drug Club.

WGY, Schenectady, N. Y. (Eastern, 380), 2:00 p. m., "Law Enforcement," Mrs. Samuel; 7:45, Radio drama, "The Green Goddess," The Rajah of Rukh, Edward H. Smith; Watkins, his valet, Frank Oliver; Major Anthony Crespin, Jerome Lovenheim; Lucilla, his wife, Rose Cub; Doctor Basil Traherne, Ed. E. St. Louis; Lieut. Dennis Cardew, John Loftus; WGI Orchestra.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Selections, Strand Theater Orchestra; "Just Among Home Folks;" Selections, Rialto Theater organ; 7:30-9:00, Concert, Louisville Normal School, Reading An Interesting Historical Episode.

WHN, New York, N. Y. (Eastern, 360), 2:15-3:00 p. m., Shapiro Bernstein Music Co.; 3:45-4:15, Irving Berlin Music Co.; 9:30-9:45 p. m., Saranoff and His Wigwag Orchestra; 9:45-9:50, Benny Leonard; 9:50-9:55, Harry Richmond; 9:55-10:00, Belle Barr, astrologist; 10:00-10:15, Milton Miller, Avery Nesbit, piano duets; 10:15-10:30, Robert Becker, baritone; 10:30-11:00, Fred Fischer Music Company.

WIP, Philadelphia, Pa. (Eastern, 509), 1:00 p. m., Organ recital, Karl Bonawitz, Germantown Theater; 3:00, Song recital; 7:00-7:30, Bedtime stories, Uncle Wip; 8:00, "Where to go and How to Get There," Eugene D. Hogle; 8:15, Dance music, Ace Brigade and His Ten Virginians; 9:00, Organ recital, Karl Bonawitz.

WJAX, Cleveland, Ohio (Eastern, 390), 8:30 p. m., Half-hour talk, Ted Robinson; "Philosophy and Folly"; 8:30, Dance program, Stromberg and Volkova Orchestra.

WJAZ, Chicago, Ill. (Central, 447.7), 10:00 p. m.-2:00 a. m., Helen L. Shaffer, soprano; Jack Crampton, baritone; Laura K. Elberg, pianist; Oriole Orchestra.

WJZ, New York, N. Y. (Eastern, 455), 3:00-4:00 p. m., Wanamaker Concert; 4:00-4:45, "The Threshold Players"; 4:45-5:05, Beatrice Nelson, soprano; 5:25-5:45, William F. Hirschman, baritone; 5:25-5:40, Naama Knoll, violinist; 6:00-6:30, Jack Rabbit Stories, Dan Cory; 7:30-7:45, World's Work; 7:45-8:05, Dan Tanseman, pianist; 8:15-9:00, Wanamaker Opera Concert; 9:00-9:15, The Sterling Quartet; 9:15-9:20, E. M. Young, Financial World magazine; 9:30-9:40, The Sterling Quartet; 9:45-10:00, "How to Finance a Home," David B. Hutton; 10:00-10:30, Varghe

RE OF CURRENT WEEK'S PROGRAMS

Edward H. Goodrich, below, gives extension course lectures on Radio Wednesday nights at WBZ, Springfield. November 7 his subject is "Electric Capacity"



Hear Merle Holman, the charming soprano, above, sing popular songs, Thursday, November 8, from Station WHN, New York

announcer, a precedent 10. n. Right the role

Knaff, pianist; 10:30-11:30, Hotel Commodore Dance Orchestra.

WLW, Cincinnati, Ohio (Central, 309), 4:00 p. m., Classical Piano Selections, Adelaide Apfel; 10:00, English Program, Cincinnati Conservatory of Music; English Songs Lyda Darling; From "Romeo and Juliet," Act 2, Scene V, Juliet, Helen Schuster-Martin; The Nurse, Helen Rose; "Drink to Me Only With Thine Eyes," String Quartet; "Twelfth Night," Act 1, Scene V, Viola, Helen Schuster-Martin; Orlina, Lima T. Smith; Maria, Helen Rose; Songs, Miss Darlington; 11:30, K Y Key Pioneers.

WMAQ, Chicago, Ill. (Central, 447.5), 7:00 p. m., Weekly talk, Boy Scouts; Weekly talk, Rockwell Stephens, automobile editor; 7:30, Lecture, Art Institute of Chicago; 9:15, Paul Mallory, tenor.

WGC, Davenport, Iowa (Central, 484), 12:00 m., Chimes concert; 3:30 p. m., Karl G. Stephan, lecturer; 5:45, Chimes concert; 8:00, P. S. C. Orchestra; V. B. Roche, baritone.

WDO, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Organ recital, Mary E. Vogt; 12:00-12:55 p. m., Luncheon music, Wanamaker Crystal Tea Room Orchestra; 4:45-5:00, Organ recital, Mary E. Vogt.

WOR, Newark, N. J. (Eastern, 405), 6:15-6:30 p. m., "Children of the Stage," Harry Schulman; 6:30-7:30, "Music While You Dine," Tom Cooper's Country Club Orchestra.

WWJ, Detroit, Mich. (Eastern, 517), 9:30 a. m., "Tonight's Dinner," Woman's Editor; 3:00 p. m., Detroit News Orchestra; 8:30, Detroit News Orchestra; Vocal numbers, pupils of Madame Hughes Thomas; 10:45, Detroit News Orchestra.

4:45-5:55, Short talks and song recital; 7:30-8:00, Bedtime stories, Dream Daddy; 8:00, Book review, Doris Hyde; Radio play, the Walter Greenough Players; 10:10, Dance music, Howard Lanin and his Arcadia Cafe Orchestra; special "Morning Glory Club" features.

WDT, New York, N. Y. (Eastern 405), 12:00-12:15 p. m., Dr. Arthur Brooks, Astrologist; 12:15-12:30 p. m., Himmie Clark's Broadway Entertainers; 11:00-11:15 p. m., Merry Makers Orchestra; 11:45-11:30 p. m., Harry Fagan; 11:30-11:45 p. m., Dave White.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., Sunday School lesson, Dr. Robert Stuart Hyer; 8:30-9:30, Mizpah Orchestra, Raymond Bevel, director.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Dinner music, Bellevue Stratford Concert Orchestra; 6:30 p. m., Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 7:00 p. m., Bedtime stories, Cousin Sue.

WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1:00 p. m., George Albert Bouchard, organist; 6:30, Vincent Lopez Hotel Statler Dance Orchestra; 7:00, Digest of the day's news; Road reports; 9:00 Concert Gamma Sigma Ukelele Club; 1:00, Vincent Lopez Hotel Statler Dance Orchestra.

WGY, Schenectady, N. Y. (Eastern, 380), 2:00 p. m., "Decorative Features for the Living Room," 6:30, Children's program; 7:45, Part I: Recital, Bomar Cramer, pianist; Huskin' Bee at Josh Quinby's, Corn Huskers Orchestra; Cowbell Four, Elsie Adie, Mrs. C. A. Lamb; 10:30, WGY Orchestra; William Fay, baritone; Breta M. Fay, pianist; Peter Schmidt, saxophonist.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Selections, Strand Theater Orchestra; "Just Among Home Folks"; Selections, Alamo Theater organ; 7:30-9:00, Concert, Francis East Wallace; Reading: An interesting historical episode.

WHK, Cleveland, Ohio (Eastern, 283), 8:00, p. m., "Popular concert, WHK Trio.

WHN, New York, N. Y. (Eastern, 360), 2:15-3:15 p. m., Indiana Five Orchestra; 3:45-4:00, Playwriting and acting, Bernard J. McOwan; 5:00-5:15, "The Truth About the Kentucky Mountaineer," the Forgotten Child Crusaders of the Coney Creek Community Center, between the ages of 11 and 17; 9:45-10:00, Lisa Bickman, soprano, Gertrude Fox, accompanist; 10:00-10:30, Pyramid Dance Orchestra, Al Bush, director; 10:30-11:00, Fred Whitehouse Revue.

WIP, Philadelphia, Pa. (Eastern, 509), 3:00 p. m., Song recital; 6:02, Dinner music, Dick Regan's Little Symphony Orchestra; 7:00-7:30, Bedtime stories by Uncle Wip.

WJAZ, Chicago, Ill. (Central, 477.7), 10:00 p. m.-2:00 a. m., Betty Riegan, contralto; The Stamford Concert Quartet, Gertrude Farrell, soprano; Leah Pratt, contralto; John Stamford, tenor; W. Doyle Watt, bass.

WJZ, New York, N. Y. (Eastern, 455), 3:00-4:00 p. m., Hotel Astor Organ Recital, 4:00-4:05, "Women's Wear," 4:05-5:00, Concert, Frances E. Baehr, soprano; Alice M. Rate, alto; 5:15-6:30, "International Interpreter"—a magazine; 5:30-5:45, Talks, "Forgotten Child Crusaders of Kentucky," 5:45-6:00, Market Reports; 6:00-6:30, Cloverfield Farm Stories, Helen Fuller Orton; 7:30-7:45, "Sports," Wm. J. Slocum; 7:45-8:00, Looseleaf Current Topics; 8:10-8:30, Burr McIntosh, "The Cheerful Philosopher," 8:30-10:30, Concert, Princeton and Harvard Glee Clubs; 10:30-11:00, Maddalena Hauff, soprano.

WLW, Cincinnati, Ohio (Central, 309), 4:00 p. m., One-act play, "Pierrot's Mother," Margaret Spaulding, Pierrot; Coda Dishler, Mother; Helen Ziegler, Pierrette.

WMAQ, Chicago, Ill. (Central, 447.5), 4:30 p. m., Bush Conservatory of Music; 7:00, "Wide Awake Club," Mrs. Frances Ford; 7:30, Weekly musical lectures, Mrs. Marx Oberdorfer; 9:15, Madame Elsie Kaulbarska-Mugrave, pianist; Frank D. Greif, tenor.

WOC, Davenport, Iowa (Central, 484), 12:00 m., Chimes concert; 3:30 p. m., C. C. Flanagan, lecturer; 5:45, Chimes concert; 6:30, Sandman's visit; 8:00, Musical program, Erwin Swindell; Program, Exchange Club of Rock Island, Ill.

WOO, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Organ recital, Mary E. Vogt; 12:00-12:55 p. m., Luncheon music, Wanamaker Crystal Tea Room Orchestra; 4:45-5:00, Organ recital, Mary E. Vogt; 7:45, Dinner music, Hotel Adelphia Concert Orchestra; 8:30, Song recital; 9:00, Organ recital, Mary E. Vogt; 10:10, Dance music, Hotel Adelphia Dance Orchestra.

WOR, Newark, N. J. (Eastern, 405), 6:30-7:00 p. m., Man in the Moon; 7:00-7:30, Margaret Behling, mezzo-soprano.

WWJ, Detroit, Mich. (Eastern, 517), 9:30 a. m., "Tonight's Dinner," Woman's Editor; 3:00, Detroit News Orchestra; 8:30, Detroit News Orchestra.

by Aunt Nell; 10:00, Dance music, George Olsen's Metropolitan Orchestra.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Concert; 2:30-3:30, Matinee musicale; 6:45-7:30 p. m., Children's program; 8:00-10:00, De Luxe program; 10:00-12:00, Art Hickman's Orchestra.

KSO, St. Louis, Mo. (Central, 546), 3:00 p. m., Program group of children under 14 years of age; 8:00, Program Missouri Theater.

KYW, Chicago, Ill. (Central, 536), 11:35 a. m., Table talk, Mrs. Anna J. Peterson; 2:00 p. m., University of Chicago vs. Indiana University; 6:50, Children's Bedtime Story; 7:45, Synopsis of the Opera preceding each act, written by Mrs. George B. Foster; A. W. Kane, announcer; Grand Opera; Lucia di Lammermoor (in Italian), Lord Henry Ashton, Giacomo Rimini; Lucia, his sister, Florence Macbeth; Edgar Ravenswood, Giulio Crimi; Lord Arthur Bucklaw, Jose Mojica; Raymond, Virgilio Lazzari; Alice, Lucia's confidante, Elizabeth Kerr; Norman, Captain of the Guard, Ludovico DiIviero; Incidental Dances, Corps de Ballet; Pietro Cimini, conductor.

WBAP, Fort Worth, Texas (Central, 476), 7:00-7:30 p. m., Horley of Sunday School lesson, Radio Bible class, Mrs. W. F. Barnum, leader.

WBZ, Springfield, Mass. (Eastern, 337), 7:00 p. m., Dinner concert, Hotel Kimball Trio, Jan Geerts, violinist; Angela G. Lonergan, cellist; Paul Lawrence, pianist; 7:30, Twilight tales for the Kiddies; "This Week's Judge," 8:00, Mrs. Nellie Hamilton, pianist; Gladys Sobie, soprano; 9:00, Bedtime story for Grown-ups, Orison S. Marden.

WDAP, Chicago, Ill. (Central, 360), 1:40 p. m., Concert, Drake Concert Ensemble and Blackstone String Quintet; 7:00, Drake Concert Ensemble and Blackstone String Quintet; 10:00, Harmony Girls, Betty Holmes, and Co's Orchestra; 11:00-12:00, Mrs. Lena E. Pfelder, singer.

WOAR, Philadelphia, Pa. (Eastern, 395), 12:00-12:54 p. m., Organ recital, Stanley Theater; 2:00-3:00, Concert, Arcadia Cafe Concert Orchestra; 4:45-5:55, Song recital; 7:30-8:00, Bedtime stories, Dream Daddy.

WOT, New York, N. Y. (Eastern, 405), 12:00-12:30 p. m., Tinkerman and the Winged Taxi, Edith J. Crane; 12:45-1:15, Fisher Favorites with the Fisher Four and Orchestra.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., "Music Memory Measures," Studie Williams, supervisor of music, Dallas city schools; 8:30-9:30, A. Harris & Co's Orchestra; 11:00-12:00, Mrs. Lena E. Pfelder, singer.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 3:00, Song recital; 6:30, Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 7:00, Bedtime stories, Cousin Sue; 9:00, Concert; 10:10, Dance music.

WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1:00 p. m., George Albert Bouchard organist; 6:30, Vincent Lopez Hotel Statler Dance Orchestra.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Strand Theater Orchestra; "Just Among Home Folks"; Selections, Rialto Theater organ; 7:30-9:00, Concert, Syrian Trio, Fannie E. Stoll, violinist; Myrl Christian, futeist; Evelyn Kaiser, pianist; Reading: An interesting historical episode.

WHN, New York, N. Y. (Eastern, 360), 2:15-3:15 p. m., Fred Whitehouse Revue; 3:45-4:45, Eddie di Lalla's Ideal Novelty Orchestra; 4:45-5:15, Edw. B. Marks Music Co.; 8:30-9:45, Hettie Tillett, soprano.

WIP, Philadelphia, Pa. (Eastern, 509), 1:00 p. m., Organ recital, Karl Bonavitz, Germanantown Theater; 3:00, Short talks; Dance music, Jordan-Lewis Dance Orchestra; 7:00, Bedtime stories, Uncle Wip; 8:15, Artist recital; 9:00, Song recital; 10:10, Dance music, Charlie Kerr's orchestra from St. James Hotel.

WJAZ, Chicago, Ill. (Central, 477.7), 10:00 p. m.-2:00 a. m., Dwight Edrus Cook, tenor; Joseph Brinkman, pianist; Kenneth Flske, violinist; Oriole Orchestra.

WJZ, New York, N. Y. (Eastern, 455), 3:00-5:00 p. m., Harvard-Princeton Football game; 5:30-6:00, Market Reports; 6:00-6:30, Uncle Wiggly stories, Howard Garis; 7:45-8:00, Harper & Bros.; 8:00-8:15, Daisy Sossor, coloratura soprano; 8:15-8:30, "Arbitration on Commercial Disputes," 8:30-8:45, Daisy Sossor; 8:45-9:05, "The Marines Have Landed," Mabel Washburn; 9:05-11:30, Marine Night; Navy Band; Talk, General George Richards.

WMAQ, Chicago, Ill. (Central, 447.5), 8:15 p. m., American Legion program, Rev. Martin Luther Thomas; 9:00, Weekly musical revue, The Chicago Theater.

WOC, Davenport, Iowa (Central, 484), 12:00 m., Chimes concert; 3:30 p. m., C. C. Hall, lecturer; 5:45, Chimes concert; 6:30, Sandman's visit; 8:00, P. S. C. Orchestra, V. B. Roche, baritone.

WOD, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Organ recital, Mary E. Vogt; 12:00-12:55 p. m., Luncheon music, Wanamaker Crystal Tea Room Orchestra; 4:45-5:00, Organ recital, Mary E. Vogt.

WTAM, Cleveland, Ohio (Eastern, 390), 9:00 p. m., Regular Saturday evening dance program, WTAM Orchestra.

WWJ, Detroit, Mich. (Eastern, 517), 9:30 a. m., "Tonight's Dinner," Woman's Editor; 3:00 p. m., Detroit News Orchestra; 5:00, Football scores.

ices, First Methodist Episcopal Church, Rev. Elmer J. Helms, pastor; Arthur Blakeley, organist; 7:30-7:30, Organ recital, Arthur Blakeley, organist; 8:20-10:00, Armistice Day program.

KYW, Chicago, Ill. (Central, 536), 11:00 a. m., Central Church Service, Orchestra Hall; Dr. Frederick F. Shammor, pastor, 8:30 p. m., Excerpta from the New Testament—An American Translation, by Prof. Edgar J. Goodspeed, read by William Ziegler Nourse; 7:30, Chicago Sunday Evening Club.

WBZ, Springfield, Mass. (Eastern, 337), 11:00 a. m., Services, Church of the Unity, Rev. Charles A. Wood, pastor; 8:45 p. m., Sunday Vespers, Springfield Municipal Chimes, Ernest N. Bang, 8:30, Services, Trinity Methodist Episcopal Church, Rev. Fred W. Adams, pastor.

WDR, Philadelphia, Pa. (Eastern, 395), 2:00-4:00 p. m., Concert of popular classical selections, Arcadia Cafe Concert Orchestra.

WDT, New York, N. Y. (Eastern 405), 11:45-12:00 a. m., Colored Program; 12:00-12:15 p. m., Irving Berlin; 12:15-12:30 p. m., Fay Barnes and Edna Gardner; 12:30-12:45 p. m., Melody Boys Orchestra; 11:00-11:30 p. m., Merry Makers Orchestra; 11:30-11:45 p. m., Dave White and Ross Fowler.

WFAA, Dallas, Texas (Central 476), 2:30-3:30 p. m., Radio Chapel Bible Class, Dr. William M. Anderson, Jr., pastor; 9:30-10:00, Singers, Oak Lawn Methodist Church; 10:00-11:30, Bridging's Dallas Cafeteria Orchestra.

WFI, Philadelphia, Pa. (Eastern, 395), 4:30 p. m., Church services, Organ recital.

WGR, Buffalo, N. Y. (Eastern, 319), 3:00 p. m., Vespers services, Dr. Louis E. Chaloux, Plymouth Avenue M. E. Church.

WHAS, Louisville, Ky. (Central, 400), 9:57 a. m., Organ recital, 10:00, Church service, Broadway Baptist Church, Rev. Dr. Russell Pirkey, pastor; 4:00-5:00 p. m., Concert, Jubilate Chorus, E. J. Scheerer; Mrs. F. H. Jobanboke.

WHK, Cleveland, Ohio (Eastern, 283), 8:00 p. m., Program of instrumental and vocal numbers, WHK Orchestra, Favorite entertainers; Sunday evening sermon from the Glenview Presbyterian Church; Rev. A. H. Limouze, pastor.

WHN, New York, N. Y. (Eastern, 360), 3:00-4:30 p. m., Christian Endeavor Program; 4:30-4:45, Josephine Weiss, soprano; 5:00-5:10, "Armistice Day," Gen. Louis W. Stoenbury, National Service League; 5:10-6:00, Jack Herber's Orchestra; 9:30-10:00, Henry Merle, John Black, soloists.

WJAZ, Chicago, Ill. (Central, 477.7), 6:00-9:00 p. m., Hans Menzer, violinist; Cecile Clemens, soprano; Cora Allen Phipps, contralto; Margaret Neff, pianist; Oriole Orchestra.

WJZ, New York, N. Y. (Eastern, 455), 2:30-3:15 p. m., Services from Mount Pleasant Baptist Church; 3:15-5:00, Program, Spanish Songs and Operas, Emilio Blanco; 6:00-6:30, Bubble Book Stories.

WJZ, New York, N. Y. (Eastern, 455), 11:00 a. m.-1:00 p. m., West End Presbyterian Church Services; 8:00-8:15, "The Annalist,"—a magazine; 8:15-10:30, American Legion Armistice Night, Alfred Wilson Post.

WLW, Cincinnati, Ohio (Central, 309), 9:30 a. m., Sunday School Services, Editorial Staff, Sunday School Publications of Methodist Book Concern; 11:00, Church Services, Church of the Covenant, Rev. Frank Stevenson, minister.

Monday, November 12

Friday, November 9

KOKA, E. Pittsburgh, Pa. (326), 6:15 p. m., Organ recital, Lucile Hale; 7:30, Sunday School Lesson, Dr. E. L. Lanning; 7:45, "Come Sing with Me, Children," 8:15, Boy Scout Program, Richard Victor; 8:45, Concert, Stella Plantz, soprano; Mildred L. Feucht, concert flute quartet; Alvin Hanser, John Ingram, Michael Certner, J. Merle Hoadwick, Tillie Betzler, accompanist.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., Wa-Wan Music Club Juniors; 10:00-11:00, Bennett Concert Co.

KGW, Portland, Ore. (Pacific, 492), 3:30 p. m.; "Child Nutrition," Margery M. Smith; 8:15, Dance music, George Olsen's Metropolitan Orchestra; 9:30, "Oregon Resources," Alfred L. Lomax; 10:30, Hoot Owl with Pantages frolic.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Concert program, 2:30-3:30, Matinee musicale; 6:45-7:00, Children's program; 7:00-7:30, Organ recital, Arthur Blakeley, organist; 8:00-10:00, "San Luis Rey de Francis," Walter F. McEntire; 10:00-12:00, Art Hickman's Orchestra.

KSO, St. Louis, Mo. (Central, 546), 8:00 p. m., Program, Maplewood Baptist Church Choir, F. D. Anderson, director; John Herget, accordionist.

KYW, Chicago, Ill. (Central, 536), 11:35 a. m., Table talk, Mrs. Anna J. Peterson; 2:00 p. m., Children's Bedtime story; 10:00-11:30, Midnight Revue; The Woodfolk Concert Singers; Herbie Mintz, pianist; Sallie Menkes, pianist; "Sen" Kaney; "How Grand Opera is Broadcast," A. W. Kane.

WBAP, Fort Worth, Texas (Central, 476), 7:30-8:30 p. m., Concert, Mrs. J. G. Polhemus artists; 9:30-10:45, Concert, College of Industrial Arts.

WBZ, Springfield, Mass. (Eastern, 337), 6:00 p. m., Dinner concert, WBZ Quintet; 7:30, Twilight tales for the Kiddies; Current Book Review, R. A. MacDonald; Bedtime story for Grown-ups, Orison S. Marden; 11:00, Concert, WBZ Quintet; Demetrius Zades, tenor; Mrs. Francis Regal, accompanist.

WCBD, Zion, Ill. (Central, 345), 8:00 p. m., McElroy Saxophone Quintet; E. B. Paxton, baritone; Mrs. Edna H. Paxton, reader; Richard F. Hire, violinist; Edith Carey, contralto; Paul Stewart, cornetist; William C. Dunn; euphoniumist; Vocal duet, Edith Carey, Mrs. Dorothy C. LaBelle.

WDAP, Chicago, Ill. (Central, 360), 1:40 p. m., Concert, Drake Concert Ensemble and Blackstone String Quintet; 7:00, Drake Concert Ensemble and Blackstone String Quintet; 10:00, Rosemary Hughes, soprano; Ann Kelley, soprano; Jack Chapman's Orchestra.

WOAR, Philadelphia, Pa. (Eastern, 395), 12:00-12:54 p. m., Organ recital, Stanley theater; Dinner music; 2:00-3:00, Concert, Arcadia Cafe Concert Orchestra;

Saturday, November 10

CKAC, Montreal, Canada (Eastern, 430), 7:00 p. m., Kiddies' stories in French and English; 7:30, Concert, Cafe Bagdad, Lino Monte, director; Garrett's Harmony Men Orchestra, Jimmy Garrett, director.

KDKA, E. Pittsburgh, Pa. (Eastern, 326), 1:30 p. m., Concert, Dougherty's Orchestra; 6:00, Football scores; 6:15, Dinner concert, Westinghouse Band; 7:45, "Goodnight Story" for the Little Folks; 8:00, Concert, Westinghouse Band; Margaret Schwalter, contralto; Samuel D. Wanguard, tenor.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., Instrumental program; 8:00-9:00, The California Orchestra; 10:00-11:00, Special popular program.

KGW, Portland, Ore. (Pacific, 492), 3:30 p. m., Children's program, Webber's Juvenile Orchestra;

Saturday, November 10

by Aunt Nell; 10:00, Dance music, George Olsen's Metropolitan Orchestra.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Concert; 2:30-3:30, Matinee musicale; 6:45-7:30 p. m., Children's program; 8:00-10:00, De Luxe program; 10:00-12:00, Art Hickman's Orchestra.

KSO, St. Louis, Mo. (Central, 546), 3:00 p. m., Program group of children under 14 years of age; 8:00, Program Missouri Theater.

KYW, Chicago, Ill. (Central, 536), 11:35 a. m., Table talk, Mrs. Anna J. Peterson; 2:00 p. m., University of Chicago vs. Indiana University; 6:50, Children's Bedtime Story; 7:45, Synopsis of the Opera preceding each act, written by Mrs. George B. Foster; A. W. Kane, announcer; Grand Opera; Lucia di Lammermoor (in Italian), Lord Henry Ashton, Giacomo Rimini; Lucia, his sister, Florence Macbeth; Edgar Ravenswood, Giulio Crimi; Lord Arthur Bucklaw, Jose Mojica; Raymond, Virgilio Lazzari; Alice, Lucia's confidante, Elizabeth Kerr; Norman, Captain of the Guard, Ludovico DiIviero; Incidental Dances, Corps de Ballet; Pietro Cimini, conductor.

WBAP, Fort Worth, Texas (Central, 476), 7:00-7:30 p. m., Horley of Sunday School lesson, Radio Bible class, Mrs. W. F. Barnum, leader.

WBZ, Springfield, Mass. (Eastern, 337), 7:00 p. m., Dinner concert, Hotel Kimball Trio, Jan Geerts, violinist; Angela G. Lonergan, cellist; Paul Lawrence, pianist; 7:30, Twilight tales for the Kiddies; "This Week's Judge," 8:00, Mrs. Nellie Hamilton, pianist; Gladys Sobie, soprano; 9:00, Bedtime story for Grown-ups, Orison S. Marden.

WDAP, Chicago, Ill. (Central, 360), 1:40 p. m., Concert, Drake Concert Ensemble and Blackstone String Quintet; 7:00, Drake Concert Ensemble and Blackstone String Quintet; 10:00, Harmony Girls, Betty Holmes, and Co's Orchestra; 11:00-12:00, Mrs. Lena E. Pfelder, singer.

WOAR, Philadelphia, Pa. (Eastern, 395), 12:00-12:54 p. m., Organ recital, Stanley Theater; 2:00-3:00, Concert, Arcadia Cafe Concert Orchestra; 4:45-5:55, Song recital; 7:30-8:00, Bedtime stories, Dream Daddy.

WOT, New York, N. Y. (Eastern, 405), 12:00-12:30 p. m., Tinkerman and the Winged Taxi, Edith J. Crane; 12:45-1:15, Fisher Favorites with the Fisher Four and Orchestra.

WFAA, Dallas, Texas (Central, 476), 12:30-1:00 p. m., "Music Memory Measures," Studie Williams, supervisor of music, Dallas city schools; 8:30-9:30, A. Harris & Co's Orchestra; 11:00-12:00, Mrs. Lena E. Pfelder, singer.

WFI, Philadelphia, Pa. (Eastern, 395), 1:00 p. m., Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 3:00, Song recital; 6:30, Dinner music, Meyer Davis Bellevue Stratford Concert Orchestra; 7:00, Bedtime stories, Cousin Sue; 9:00, Concert; 10:10, Dance music.

WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1:00 p. m., George Albert Bouchard organist; 6:30, Vincent Lopez Hotel Statler Dance Orchestra.

WHAS, Louisville, Ky. (Central, 400), 4:00-5:00 p. m., Strand Theater Orchestra; "Just Among Home Folks"; Selections, Rialto Theater organ; 7:30-9:00, Concert, Syrian Trio, Fannie E. Stoll, violinist; Myrl Christian, futeist; Evelyn Kaiser, pianist; Reading: An interesting historical episode.

WHN, New York, N. Y. (Eastern, 360), 2:15-3:15 p. m., Fred Whitehouse Revue; 3:45-4:45, Eddie di Lalla's Ideal Novelty Orchestra; 4:45-5:15, Edw. B. Marks Music Co.; 8:30-9:45, Hettie Tillett, soprano.

WIP, Philadelphia, Pa. (Eastern, 509), 1:00 p. m., Organ recital, Karl Bonavitz, Germanantown Theater; 3:00, Short talks; Dance music, Jordan-Lewis Dance Orchestra; 7:00, Bedtime stories, Uncle Wip; 8:15, Artist recital; 9:00, Song recital; 10:10, Dance music, Charlie Kerr's orchestra from St. James Hotel.

WJAZ, Chicago, Ill. (Central, 477.7), 10:00 p. m.-2:00 a. m., Dwight Edrus Cook, tenor; Joseph Brinkman, pianist; Kenneth Flske, violinist; Oriole Orchestra.

WJZ, New York, N. Y. (Eastern, 455), 3:00-5:00 p. m., Harvard-Princeton Football game; 5:30-6:00, Market Reports; 6:00-6:30, Uncle Wiggly stories, Howard Garis; 7:45-8:00, Harper & Bros.; 8:00-8:15, Daisy Sossor, coloratura soprano; 8:15-8:30, "Arbitration on Commercial Disputes," 8:30-8:45, Daisy Sossor; 8:45-9:05, "The Marines Have Landed," Mabel Washburn; 9:05-11:30, Marine Night; Navy Band; Talk, General George Richards.

WMAQ, Chicago, Ill. (Central, 447.5), 8:15 p. m., American Legion program, Rev. Martin Luther Thomas; 9:00, Weekly musical revue, The Chicago Theater.

WOC, Davenport, Iowa (Central, 484), 12:00 m., Chimes concert; 3:30 p. m., C. C. Hall, lecturer; 5:45, Chimes concert; 6:30, Sandman's visit; 8:00, P. S. C. Orchestra, V. B. Roche, baritone.

WOD, Philadelphia, Pa. (Eastern, 509), 11:00-11:30 a. m., Organ recital, Mary E. Vogt; 12:00-12:55 p. m., Luncheon music, Wanamaker Crystal Tea Room Orchestra; 4:45-5:00, Organ recital, Mary E. Vogt.

WTAM, Cleveland, Ohio (Eastern, 390), 9:00 p. m., Regular Saturday evening dance program, WTAM Orchestra.

WWJ, Detroit, Mich. (Eastern, 517), 9:30 a. m., "Tonight's Dinner," Woman's Editor; 3:00 p. m., Detroit News Orchestra; 5:00, Football scores.

Sunday, November 11

KFI, Los Angeles, Calif. (Pacific, 469), 10:00-10:45 a. m., Services, L. A. Church Federation; 4:00-5:30 p. m., Services, Central Church Musicians; 6:45-7:30, Merv Wolfe Regnier, soprano; 10:00-11:00, Program, Theron Bennett, Orchestra Leader.

KHJ, Los Angeles, Calif. (Pacific, 395), 10:00 a. m., Sermon, Dr. Herbert Booth Smith, pastor, Immanuel Presbyterian Church; 10:30-12:30 p. m., Church ser-

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Fans Hear Program at \$4,000,000 Washington Memorial

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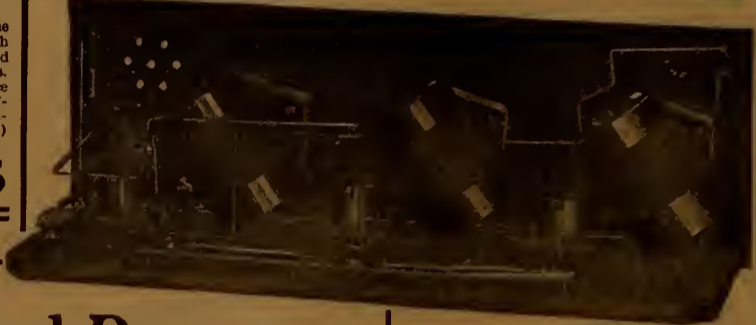
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1.00	1 John Firth Socket45
1.00	1 Freshman Grid Leak and Condenser65
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1.00	1 Patent Double Circuit Jack750
.80	8 Binding Posts05
.02	7 Switch Points01
.10	1 Switch Lever25
.50	1 Switch Lever25
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1	1 Baseboard25
3.30	2 23 Plate Condensers 1.45

Our Price \$11.95

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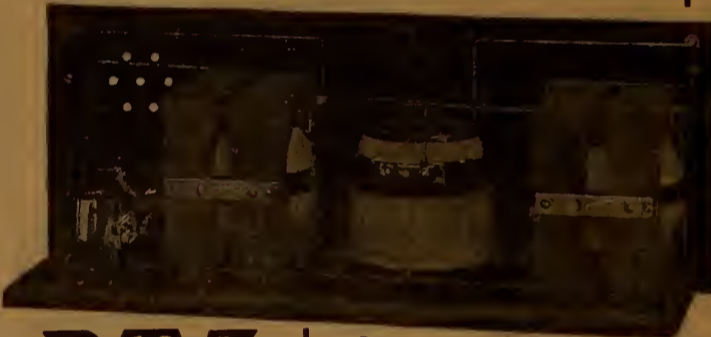
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Simple Explanation of Radio for Everybody

Chapter IV, Part III—Inductances—Fixed and Variable

By M. W. Thompson

THE following article is the seventh of a series for Radio beginners, written by Marvin W. Thompson, well known in air-phone circles for his understandable style of approaching his subject, and his ability as a Radio engineer. Mr. Thompson is now an associate editor on the staff of Radio Digest. A preliminary outline of the Chapters to follow is:

- Chapter V—Condensers—Fixed and Variable.
- Chapter VI—Vacuum Tubes.
- Chapter VII—Antennas and Grounds.
- Chapter VIII—Regeneration.
- Chapter IX—Audio Frequency Amplification.
- Chapter X—Loud Speakers.

A VARIOMETER being similar in construction to a variocoupler, we will take it up next. It is the purpose of a variometer, primarily, not to transfer energy but to change the amount of inductance in a circuit and so alter the circuit to respond to various wave lengths. The two coils in Figures 28 and 29 are connected as shown in Figure 31. When

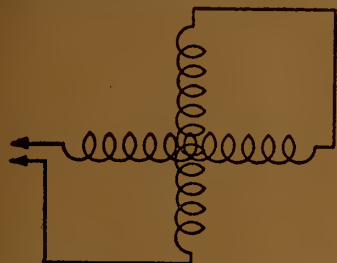


Figure 31—Showing how two coils are connected in series to form a variometer

current is passing through these coils, each creates within itself a magnetic field with N and S poles. If the inner coil is turned so that its turns are wound in the same direction as those on the outer coil (see Figure 28), the two fields will build together and aid each other, and the inductance of the coil is high. If the inner coil is rotated as shown by Figure 29, the fields do not aid each other and the inductance value is but one-half what it was previously. If we continue turning the rotor to the point where the two groups of turns are wound in opposite directions, the fields will oppose each other and the inductance becomes zero.

The two coils shown in our sketches are closely wound single-layer coils, which, as explained in the first half of this chapter, have small distributed capacity losses. For use as a variocoupler or to secure "variometer effect," the manufacturers of honeycomb, Giblyn-Remler and spider-web coils supply stands which permit one to vary the relationship between such coils

(see Figure 32). While the drawing shows honeycomb coils, the other types of winding are also thus arranged.

Another type of variocoupler, which we do not show, consists of an outer sta-

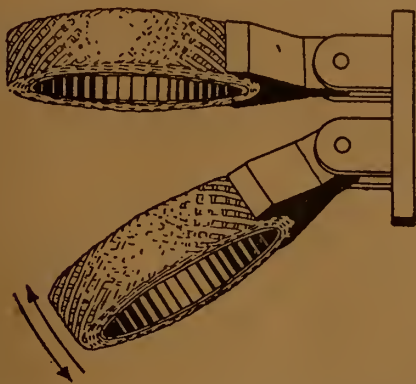


Figure 32—Top view of two honeycomb coils so mounted that their relationship can be varied

tionary coil with an inner rotor similar to Figure 28, but both windings are honeycomb and thus the compactness of the inner-outer-coil variocoupler is combined with the efficiency of the air spaced honeycomb type of winding.

Radio Frequency Transformers

There are uses to which the large diameter air-core type of inductance can be put in which the varying of coupling is not required, as in the neutroformers of the neutrodyne circuit. A neutroformer consists only of two single-layer coils, with one placed permanently within and tightly coupled to the other. This forms a transformer to handle current alternating at Radio frequencies and differs from the variocoupler in that there can be no varying of the relationship between the coils, and no taps are taken from it to permit different numbers of turns.

The unit now on the market and known as a Radio frequency transformer is another example of the use of two unconnected coils, whose positions cannot be varied and which are to handle current at Radio frequencies. At this point it might be well to explain the action of iron placed within a transformer. Inserting an iron core within the two coils of a transformer enables one coil to transfer more energy

to the other as stronger lines of force are created, but these stronger lines of force cannot be built up and dissipated as rapidly as might be desired. If there is no iron, the magnetic field will rise and fall as rapidly as the Radio frequency currents alternate; if there is too much solid iron the magnetic fields lag behind the current and choke it. Some makers of Radio frequency transformers prefer to use no iron and avoid lag; others use considerable iron and believe the slight loss due to its presence to be offset by the greater transfer of energy, while a third group compromises and uses a mixture of iron filings and some compound such as beeswax as a core.

Audio Frequency Inductances

To handle currents varying at audible frequencies and to be used between the detector and an amplifier tube or between two successive amplifier tubes, there are two units that may be used. One is termed an impedance coil, the other an audio frequency transformer. The impedance coil is used as shown in Figure 33 and its action is just what its name suggests. While it permits the direct current of the B battery to reach the plate of the tube and keep it positive, it impedes the passage of the currents varying at voice frequencies to such an extent that they travel on to

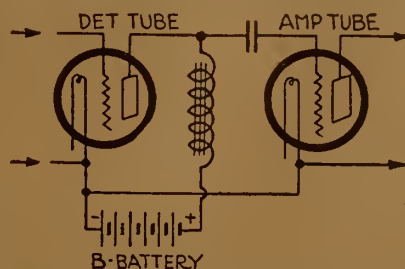


Figure 33—A single coil with iron core used for impedance coupling

the condenser in the grid lead of the following tube and create audible variations of voltage on the next grid.

The audio frequency transformer consists of two windings on an iron core connected as shown in Figure 34. The iron core can be used here without fear of

trouble, as its lag is not such that the magnetic field cannot change at audible frequencies. When two windings are placed in close relationship to each other, the ratio of the varying voltages in them

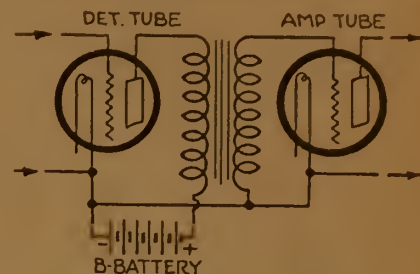


Figure 34—An audio frequency transformer connecting the detector and amplifier tubes

is as the ratio of the turns in the coils. In speaking of transformers, we always refer to the winding connected to a source of current as the "primary" and to the winding in which current is induced as the "secondary." In Figure 34 the left winding is the primary, the parallel lines the core, and the right coil the secondary.

"Transformer Action"

In the preceding paragraph it should be (Continued on page 20)

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Cold Days Revive Interest

Jack Frost Is a Welcome Visitor

SHORTER days and chilly evenings are doing much to revive interest in Radio. Practically all of the big broadcasting stations are going back to the daily winter programs. All these stations curtailed their schedules during the summer months on account of lack of interest. Within a few weeks the greatest of all indoor sports will again hold the center of the stage.

Seeing Is Believing

Just a Little Glimpse Into the Future for Radio

AN EDITORIAL appearing in a New York paper says: "The next great invention will be the Radioscope. It will reproduce by the Radio waves distant events within 10 to 15 seconds after they happen. It will develop its film direct from the receiving reel and the record will be made by the simple application of Radio tone and vibration to kin tones of light and shade. Wizards are now working to win first place with this wonderful next invention. Yet, some poor and unknown youngster may be the one to succeed. You never can tell!"

Talk about "eye openers"; some of the wielders of the quill try to make you see things you never saw before. For years and years the visionary writers have tried to dip far into the future, bringing to the mind's eye just what is going to happen in the year 1950. Perhaps this sort of a chap will get a chance to peep into the year 1950—if he lives long enough; and through Radio at that, who knows?

We are traveling fast. Just the other day a few naval officers took an evening's jaunt of 2,000 miles, started from New Jersey, looked in on St. Louis and Chicago, never stopped to shake hands with us, and returned by night so that they had rolls and coffee at home the next morning. A little slower than the Radio wave but nevertheless fast compared to what it used to be. Soon we will not need to take that jaunt in a big blimp, just switch on the Radio periscope and direct it toward the city, old home site, the schoolhouse where we spelled out our education and see it in actuality—by Radio.

Two Groups of Listeners

Building Your Own Sets and Buying Them Complete

RADIO has divided itself into two distinct groups of broadcast listeners, those who buy a complete set and those who purchase the parts and put them together in the way that suits their fancy and according to circuits which seem to them to give the best results.

The class who build their own sets are in the majority because of the fun they get out of receiving distant broadcasting stations on a set designed, built, installed and operated by themselves, and their ability to change, rearrange and experiment with new developments in Radio.

When Radio came, the man on the street found that he could make his own apparatus at a saving in cost and have a lot of fun doing it. Today hundreds of thousands in various vocations throughout the country are building their own receiving sets and amplifiers. Progressive Radio companies and Radio publications are showing them how. They are getting results and learning something of science and mechanics. Radio is developing the people of this country into a more self-reliant race.

To trace theoretical circuits and to build a set an amateur must think. The process develops the mental powers of youth and it broadens the mind of the middle-aged bank president or professional man who a few short years ago had not the slightest idea of theoretical electricity, but who is now a bear for amperes, resistance and amplification.

It may be possible that complete Radio sets will largely replace the home-made, but today the average fan is not only having a lot of fun and getting good results with his own set, but is contributing by his experiments with circuits and apparatus to more satisfactory results in the use of Radio.

RADIO INDI-GEST

Interducing Kink Miloplex Hissself!

Responding to the terrific onslaught, rush and riot of readers of Indi-Gest and other foolish Radiophans, and, as was predicted last week, Indi herewith presents the



first and only picture of that now famous personage, The Mystery Man of the Miloplex, sometimes known as King Miloplex. He and Indi are great sidekicks, both being old scouts who never drank water before July, 1919. The portrait presented herewith was stolen from the Isle of Walla Walla during the war but was returned by the Germans when they found out that it wasn't worth anything. It has never been published before and probably never will be again. We don't know who else would have the nerve to publish it. The King has been crowned time and time again by his wife, alias the cook, alias Maggie. Just what is under the crown no one knows. Indi hesitates to say what, after analyzing the three circuits he has peddled off to the great American public. Photos of Maggie are still being made, after fourteen unsuccessful attempts in which the camera went into self-oscillation and paralyzed itself.

A-B-C Lessons for Indigest Beginners

Chapter XXI—Milo Is It Now

BY GOSH

U IS for the ultimate,
The last word in sets,
And when you think you have it
A new one calls your bets.

Our Staff Photographer's a Wonder

Dear Indi-Gest: In interpreting the "boy milking cow" picture on the last page, upper right, September 29, you misunderstood cow language. The cow is not at all interested in Radio, but is looking for the best position to register a center kick to the boy who is attempting to milk her on the wrong side. Better try again. E. F. C.

Send Us the Last; Keep the Rest

Dear Indi: I have been putting the Capitol Theater on the air here in N. Y. C. for almost long enough to furnish a house. Reason for that statement? Ah, that's easy. My worldly goods have been enriched by the following tokens of esteem, presented by admiring Radiophans:

- Fresh flowers.
- Fresh fruit.
- Fresh fish.
- 2 pair of pink sleeve garters.
- 1 book of poetry with the compliments of the author.
- 1 oil painting with the compliments of the artist.
- 141 ballads with the compliments of the composers.
- 7 original cartoons.
- 1 Airedale.
- 1 Police Dog.
- 238 Souvenir postcards from Radiophans on vacation.
- 17 ditto from honeymoon couples at Niagara Falls.
- 92 ditto from ditto at Washington, D. C.
- 1 hand-embroidered whiskbroom holder.
- 1 quart bottle of what-have-you. S. L. ROTHAFEL.

Now We Know Who Is Doing the Dirty Work

Hear me laugh and chuckle with glee,
'Tis such a funny thing to see,
The way I violate the laws,
And all the troubles I can cause.

I broadcast when I please,
Come pounding in with ease;
I crackle, snap and boil,
Caring not what I spoil.

Why fight you, simple fools?
'Tis his Satanic Majesty who rules,
And does so many things erratic,
To which you've given the name Static. H. K. C.

Using That Junk? We Doubt It

Dear Indi-Gest-able: Please look carelessly over the enclosed diagram of my new set and try to explain why it won't work. In place of a detector tube I am trying out a special .002 Radio Corporation "Patent" in series with the transverse process of the seventh dorsal vertebra. Tuning is thru a 13-plate Music Trust invaluable condenser. Should it work? GRID LEAK.

P. S. I guess I won't send the diagram, you couldn't understand it anyhow. G. L.

See King Tut Proof; Page 4 Last Week

* Dear Indi: Who said Radio is a new thing? Why long ago they named places after spare parts. Frinstance take Galena and Crystal City, both in Illinois.

MIKE ROFARADS.

It Might Be Anything

Dear Indi: I got the following song over the Radio last night. What might its name be:

Darling I am growing bananas,
We have no string beans among the gold,
Cabbages shine upon my brow today,
Old fashioned tomatoes are fading fast away. E. S. P.

To Indi-Gest Contributors and Prospective Helpers: Indi-Gest wants to thank each and every one of you for your prompt acknowledgment of the recent invitation to help. Still paging Spider Web, Le Moquer, Rotor E. Gap. Where are you? Indi.

He Must Have Been Wrong



Condensed

By DIELECTRIC

If you manufactured a phonograph to sell the gullible public, the tones of which were not perfectly free from a scratching noise, would you predict its certain removal from the market unless the unpleasant sound was eliminated quickly? I think so, too. No talking machine is free from mechanical sounds; nor is there a Radio receiving set made that is impervious to static's annoying spluttering. But to say, as Mr. Edison is quoted as saying, that unless the frying noises in Radio sets are prevented the interest in broadcast reception will quickly die—well, we shall see. A great inventor may fail as a prophet.

The football season is on with a vengeance. Many college graduates are so located as to be unable to attend a single game in which their alma mater takes part. To them the broadcasting of each play is an invaluable gift and far more stirring than to read about it. WNAC will continue to broadcast games from the Harvard stadium until the end of the football season. WEAJ gave to a multitude of interested ones the contest between Syracuse and Pittsburgh, describing each incident in and out of the game, when those two teams met on the field of the Yankee stadium in New York. WJZ fed the Princeton-Notre Dame listeners in on the same day. There is really little missed with Radio in your home.

No more useful agency in the advancement of Radio (including Radiophony) exists than the amateur operator of a code station. He has contributed bountifully to the good of the science, incidentally to every broadcast listener in the world. Governmental regulations have safeguarded his continuance and at the same time provided for the happiness of concert fans. A certain owner of a receiving set near Chicago has a grievance against an amateur, located in the same town of Dwight, complaining of being unable to enjoy his concerts via Radio because of the code messages emanating from 9CA. By all means let's have every high powered commercial station in the land shut down while we listen to our favorite studios broadcast. What constitutes "profit"? McWilliams vs. QRM.

A new Radio station is under way at Wilmington, Calif., adding one more to the great transmitting stations owned by the R. C. A. Within a few months this station will be on the air, sending and receiving messages from a maximum distance of 15,000 miles. To the shipping through the Panama Canal this will be a great boon, though that is but one of its many points of advantage.

A feature that will no doubt find much favor among ship owners is the proposed use of a Radiophone equipment, by which speech may be had between ships at sea and Los Angeles offices, with the aid of land wires.

I trust broadcast announcers will take amminute to read the next few lines; the rest of you skip it. Several hundred miles from one of the great broadcasting stations a dealer tuned it in and entertained the crowd with its program. Seldom did the announcer state where he was, giving only the call letters. It may seem strange, but many among the listeners that evening were unfamiliar with the call, hence little realized how far away was the orchestra. Think it over!

Speaking of grand opera and musical broadcasts in general, I was interested to see that Musical America contains a column, under the captious title of Mephisto, supporting the stand taken by one of the publishers of operatic music compelling payment of a fancy sum before allowing certain scores to be broadcast. My sympathies are not at all with this position, for I still contend that attendance at grand opera performances will increase in proportion to the number of folks educated to its beauties.

How to Build a Three-Tube Miloplex Receiver

Part II—Assembly of Apparatus

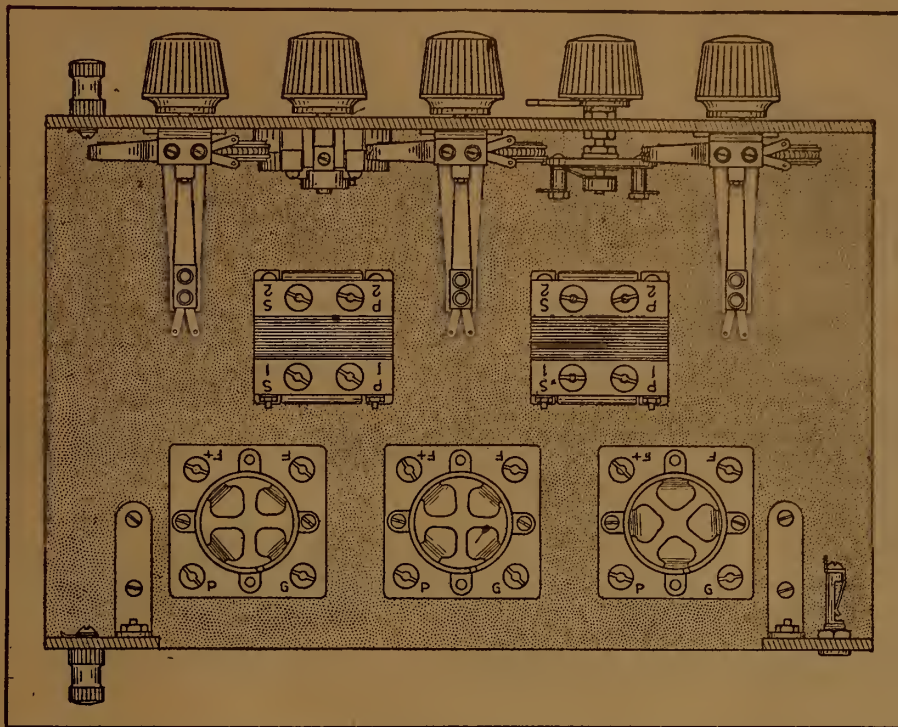
By H. J. Marx

AFTER the apparatus has been purchased, the panel layout finished and the panels drilled, the troubles are by no means over. The proper arrangement of the parts on the baseboard in the rear of the panel is too often overlooked. There is a vague idea that leads should be kept as short as possible, yet nine times out of ten the fan thinks of it, but doesn't take it into consideration when laying out the parts in the rear.

The use of jacks for plugging in at various stages is very convenient, but the amount of wiring is increased thereby, and unless the apparatus is arranged with regard to these extra wires, it becomes difficult to make the connections without recrossing wires and running all around the various pieces of apparatus. Filament control jacks are even worse in this respect. Since three rheostats are used, there is no need for the filament control, however.

Position of Transformers

The detector tube, plate terminal and primary of the first audio transformer are connected to the first jack, so their positions in the rear should be in close proximity to this jack. Then, the grid terminal



with and next to the one on the second unit.

The brass angles were purchased in a five and ten-cent store, but can be made at home if not available.

Binding posts can be substituted for the connection jacks if desired, the selection of these parts being entirely optional.

Plan View of Second Unit.

No dimensions are given in the plan view of the base layout of the second panel. Dimensions will be determined entirely by the apparatus used, but the layout suggests the most efficient arrangement of parts for short wiring.

Particular attention should be paid to the relative position of the transformers and tube socket terminals. This arrangement permits short wiring and at the same time the transformers are far enough apart to avoid interference between their magnetic fields.

Improvements in the hook-up diagram has necessitated the postponing of this illustration until the next issue. The circuit will then be shown and the wiring will be discussed in detail.

(TO BE CONTINUED.)

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Special Sets Made to Order

Let us quote you on any circuit.

Send for Miloplex Price List

FORBES RADIO CO.

127 N. Dearborn St. Chicago, Ill.

the second jack, so this must be equally considered in the arrangement. Again, the grid terminal of the secondary of this transformer must be connected to the grid of the third tube, so this, too, must be provided for in the planning. The plate terminal of this third tube must be convenient for connection to the third jack.

Inter-Panel Connections

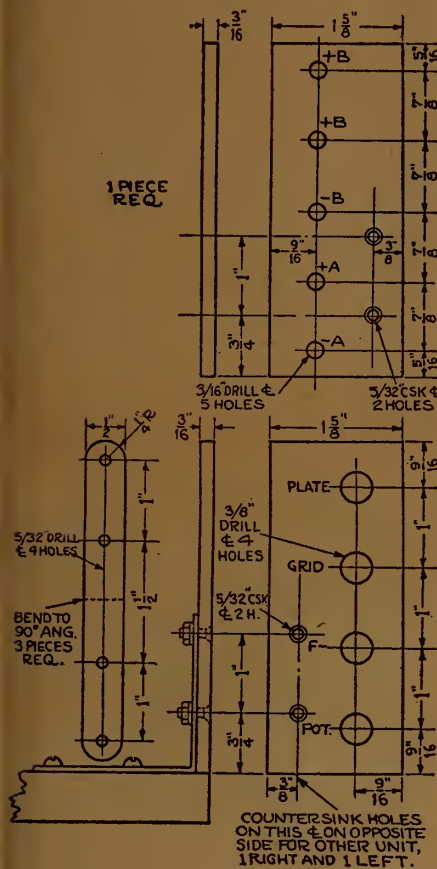
The connections between the two panels must be made convenient for external connections, and at the same time the leads to the apparatus must be considered.

Details are given of the drilling of the three small connection blocks. The one shown on top is for the battery binding posts and is mounted, by means of one of the brass angles, at the outer end of the base of the second unit.

The other two blocks are shown at the bottom, and consist of right and left-hand

pieces. The same angle is used for mounting them. The exact position on the base of the second unit is shown in the plan view layout.

Since all the apparatus of the first unit is mounted on the panel, no further plan view is given. The position of the connection block is on the right side in line



terminal on the secondary of the first transformer should be connected to the grid terminal of the second tube. This lead should be as short as possible. Therefore these two parts should be arranged so these terminals are close together.

The plate terminal of the second tube and the primary of the second audio frequency transformer must be connected to



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AMPLITONE

LOUD SPEAKER

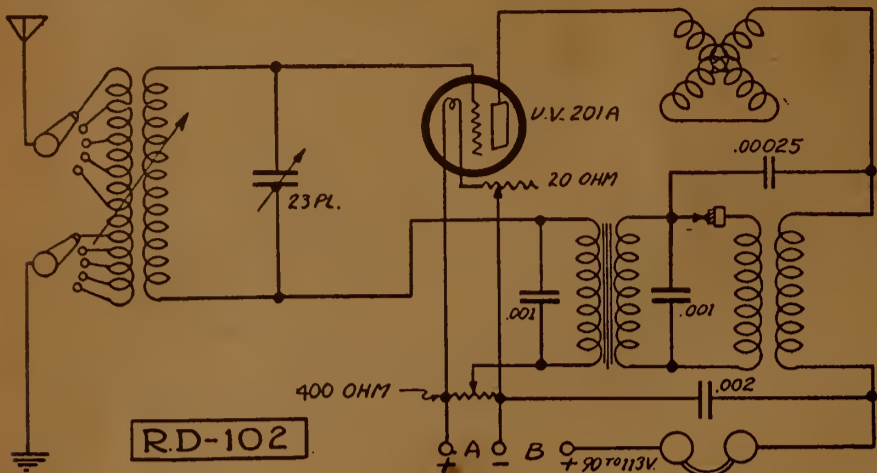
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TRADE MARK

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ORANGE ST. RADIO DIVISION NEWARK, N. J.

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FANS very often fail to get due credit for their efforts in developing little alterations in circuits that are really distinct improvements. Mr. J. P. Flaherty, Rialto Theater Bldg., Louisville, Ky., has sent us his development of a single tube reflex and asks us to offer it to the fans.

His circuit is shown in the illustration as hook-up R.D.-102 and his letter follows: "After experimenting for the past six months with every reflex circuit known, I have decided the following one is the best, and hereby ask you to publish it for the benefit of the many reflex amateurs."

"The circuit, with exception of the variometer regeneration and fixed condenser across primaries of both transformers, was originally presented by Mr. Harry J. Marx of Radio Digest.

"I am covering the whole United States with this one tube circuit, with any amount of volume and clarity desired. Briefly there is no end of encouraging surprises in this circuit. I have heard

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For those who want something less expensive we can recommend our 4 to 1 Fixed Coupler as being excellent in design and workmanship, but we do not make any claims about its being a Vernier Tuner. It's fixed. The condenser must do the tuning.

If you want to know more about close tuning, send 10c and dealer's name for our booklet.

Bremer Tully Mfg. Company
532 South Canal Street CHICAGO



Ask your Dealer about "HEGEHOG"

(Trade Mark)

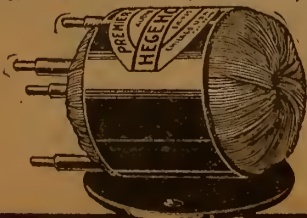
AUDIO TRANSFORMER \$3.50

This little wonder is the surprise and talk of Radio Engineers everywhere. Fix in your mind's eye an AUDIO Transformer about the size of an English walnut and you have the "HEGEHOG" for size. Then recall the best Radio amplification you ever heard, and you have the "HEGEHOG" for volume and tone quality. Our new patented design and construction (100% shielded) makes this possible. It's a real bit of engineering, and we would like to have YOU try one.

Ratios 1 to 3, 1 to 4 and 1 to 5.....\$3.50
1 to 10.....4.50

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Set is Fully Guaranteed. Wonderful Distance Reported by Enthusiastic Users.

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- DV-6, DV-6-A 3.50 each

All Work Fully Guaranteed

Quick Service—Repaired Tubes shipped C. O. D. unless accompanied by remittance plus postage.

NEW TUBES

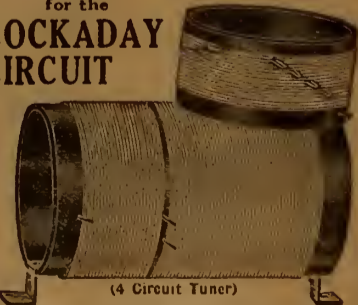
- A-399 (Type UV-199) \$4.10
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- A-12 (Type WD-12)

All the above Tubes guaranteed amplifiers and detectors. Shipped C. O. D., postage prepaid.

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are now a standard, and in universal use, due to their efficiency in this wonder circuit. Made as per specifications of Mr. Cockaday, using No. 18 wire with D coil bank-wound.

Complete Assembled Set of B, C and D Coils..... **\$2.75**

Hook-up directions and material list furnished free with each set of coils.

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stations at Kansas City, Omaha and others at equal distances, with no aerial other than 15 ft. of wire thrown upon the floor. I can hear WHAS, a distance of six miles with no aerial or ground.

"I would like to hear from other amateurs concerning this circuit."

The Reader's View

Consideration for the Broadcasters
There has been a decided tendency on the part of some fans to belittle the programs given out by various broadcasting stations throughout the country. Many seem to forget that the broadcasters are handicapped at times, as well as the fellow on the receiving end. They seem to think that a great deal of the music, lectures, concerts, etc., broadcast evening after evening, is executed by poor talent and is too much of a repetition of the same thing. These fans do not consider the fact that they receive all of this free, and that, besides, they have a choice of several stations and may select the one they like best. Tastes are not alike; some

like jazz, some classical music, some lectures, some sports, etc., and it is hard to please everybody.

Have some consideration for the broadcasting station. Don't expect too much, especially when the Radio business is still in its infancy. If we lived in Europe and had to pay a license on our receiving sets, and then have only a comparative few stations to listen to, we might have some real cause for complaint.

I am not in favor of a government license on a receiving set. This is in answer to an article by W. R. Spangle, in "The Reader's View" of your September 22 issue.—R. A. Pauly, Springfield, Ohio.

It is estimated by engineers that the current picked up by the antenna is about three trillionths of the energy broadcast from the transmitting station's aerial.

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"The All-Metal Quality Instrument—GUARANTEED"

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Embodies all the advantages of the well known Elgin Reinartz (the set which was largely responsible for the popularity of this wonderful circuit) and many others. It is much louder, more selective, requires no storage battery, and can be used with excellent results on a short or loop aerial. It has brought in California stations two thousand miles from Elgin, clearly and without interference on a loud speaker with only one tube, and that while our powerful local station was broadcasting three miles away.

Could you ask for more? Write for circular giving one, two and three bulb hook-ups of this remarkable circuit. IT IS FREE.

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- Lanchelin & Kaufman Variometers and Variocouplers\$6 ea. Finest instruments in the world.
- Myers Hi-Mu Tubes.....\$4.35
- Amperite-Automatic Filament, eliminates Rheostat.....Unmounted, 70c; mounted, \$1.10

All merchandise absolutely guaranteed. Shipped immediately on receipt of purchase price.

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Price Only **\$140**

Complete knock-down parts for Melco-Supreme, including drilled engraved Bakelite panel and solid mahogany cabinet.

The Radio-Frequency Amplifying Receiver that— Operates with merely a 10 Ft. Wire—not even a ground necessary. Offers exceptional Clarity without the slightest loss of tone quality. Assures unusual program Selectivity through its single tuning adjustment.

Affords real Long Distance by covering all Broadcasting ranges from 180 to 610 Meters.

We also manufacture a complete line of parts under the Amsco Brand. Write for our complete literature.

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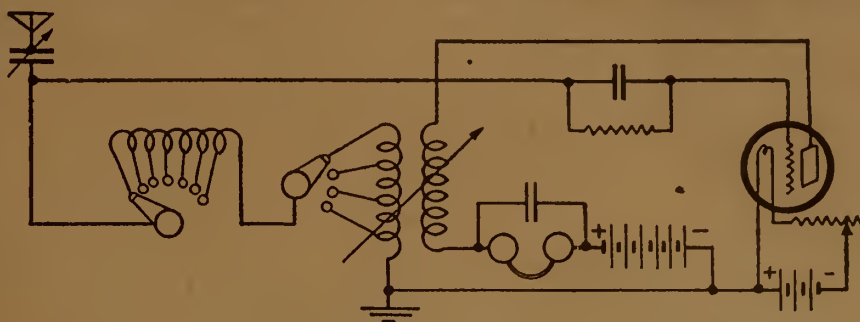
Price \$90

Simple Coil Increases Range of Old Set

Distance Accomplished on Single Circuit Set

Having a single circuit receiver that would tune to only about 425 meters and using a variocoupler with 65 turns on the primary and 60 on the tickler, I found that when the broadcasting wave lengths

VOLUME OF RECEPTION ENLARGED



Levers for Dial Turning

Many fans have wondered how they can eliminate body capacity effects without shielding the panel. The arm or handle shown in the illustration, eliminates body capacity effects and also acts as a vernier for condensers, couplers and variometers. It helps greatly in picking up outside stations and does not take up any panel space. After a station is tuned in, the arm may be removed from the dial and put out of the way.

The parts required may be found in any Radiophon's "junk box."

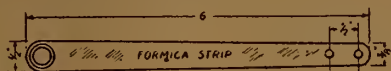


FIG. 1

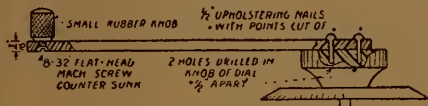


FIG. 2

The parts needed are: One strip formica 6 by 1/2 by 1/8 inches, one small rubber knob, two upholstering nails 1/2 inch long, and one flat head machine screw 3/8 inch long.

The strip of formica, cut down on one end to 3/8 inch and the ends rounded, is shown in Figure 1. At the narrow end drill two holes 1/2 inch apart and slightly smaller than the diameter of the nails so that they will fit tightly. At the other end

drill a 1/8-inch hole and countersink it for the head of the machine screw. Push the nails through the holes at the narrow end, as far as the heads, and cut off the points so that 1/4 inch of the body will project from the strip. With the machine screw fasten the small knob on the other end. In the knob of each dial to be used drill two holes 1/2 inch apart and slightly larger than the diameter of the nails (Figure 2). In some sets the knobs and dials are placed close together. Where this happens to be the case the strip will need to be shorter, to avoid striking the other knobs.—Robert Shimek, Chicago, Ill.

Neat Way of Mounting Condenser on the Panel

Many variable condensers, when mounted directly on the panel, allow the screw heads to show on the outside of the dial, thus detracting from the appearance of the finished set. As the shafts on these instruments are usually a trifle longer than necessary, this is easily overcome by first mounting the condenser on a piece of bakelite or wood, and then mounting the whole on panel with flat-head screws, countersunk under the dial.

This kink can also be applied to variocouplers, variometers and tuning coils, and the finished appearance will well repay one for his trouble.—Nell E. Henry, Lynchburg, Va.

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,
123 W. Madison St., Chicago

were changed, some alterations were necessary to receive the longer waves. However, as I did not wish to rebuild the set nor to purchase a larger condenser (the one in use being 23 plate) the following plan was decided upon, and gave good results:

A cardboard tube, 3 1/2 inches in diameter, was wound with 70 turns of 24 dec. wire and tapped every ten turns. The cabinet was not large enough to accommodate this coil and a special one was built 6 by 6 by 5 inches, the coil being mounted in a horizontal position. A 6 by 6 bakelite panel was used and holes were drilled to mount switch, switch points and binding posts as shown in the diagram. Leads were run from the taps on the coil to the switch points. One end of the coil was connected to the lower binding post, the switch being connected to the other.

The loading coil was then mounted on top of the set and connections made through 1/8-inch hollow fiber tubing run through the top. It was found to work best connected between the condenser and the switch of the variocoupler.

The use of this coil seemed to increase the volume of reception, as 360 and 400 meter stations that were hard to bring in before, came in very plainly. The following stations have been heard frequently this summer, with this arrangement: KSD, WOAW, WMC, WOS, WEAY and WOAL.—R. Lewis Rockett, Ft. Worth, Texas.

Efficient operation of a Radio receiving or transmitting set depends on the proper adjustments of inductance and capacity.



W W

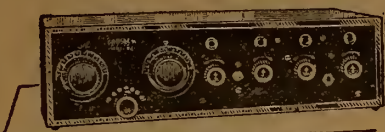
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Kindly send me the type "B" tube detector and if it is anything like your crystal it must be a wonder. You will hear again from me or my friends. Best wishes for your success. I am very truly yours,
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RADIO FOR EVERYBODY

(Continued from page 15)

noted we said "the ratio of the varying voltages is as the ratio of the turns." Because there are 22 volts in the primary of our audio frequency transformer, it does not mean there will be 110 volts on the grid of the amplifier tube if the ratio of the number of turns in our windings is 5 to 1. The voltage in the primary of the transformer will have a maximum of 22 volts, but it may vary below that figure 2, 3, or 4 volts. Thus, if our incoming signals vary the potential on the grid of our detector tube so that it varies the voltage in the plate circuit between 18 and 22 volts, there will be voltages on the grid of our amplifier tube varying between zero and 20. The maximum variation in our primary is 4 volts, the ratio is 5 to 1; therefore, the maximum voltage on our next grid is 20. It should be understood that in "transformer action," while we triple or quadruple the voltage, we divide the current or amperage by three or four. Energy cannot be created in a transformer—energy is figured in watts—watts are the result of multiplying volts by amperes—as the voltage is raised, the amperage is lowered. As it is large voltage changes that we desire, the lessening in amperage does not matter.

So much for our inductances. In the next chapter we will see how capacity is provided in the form of condensers both fixed and variable.

(TO BE CONTINUED.)

NEW MILOPLEX CIRCUIT

(Continued from page 11)

sibly make it even more understandable, if you should sound the key of C and E simultaneously upon a piano, the resultant note would not be either C or E but that produced by their combination. It is this third tone which we are desirous of using in the Miloplex, or as Mr. Marx says, the result of a heterodyne effect, it being sharper and more easily handled. Many will question, a few dispute the possibility of producing such a tuning result. Frankly, I am not positive that I do, yet it still holds true that some such action is taking place, as at times when the settings of such tuning is correct, a varying frequency is produced indicating super-regeneration. To those who have amplified circuit three, or the final circuit, and have apparently by so doing lost some of the circuit's selectivity, may I suggest as a remedy the insertion of a .006 fixed condenser in the plate-to-antenna connection? It sometimes occurs, when amplifying, that the impedance of the first audio windings, which connected became a high impedance by-pass through the B battery to A, inserts to much resistance coupled to the primary and hinders selectivity. By inserting a fixed condenser as suggested, this impedance is eliminated, and we at once secure our original primary selectivity, thus retaining a balance that is very desirable. It should be understood that the total circuit of the Miloplex, excepting the tuned Radio frequency oscillating rotor circuit, is the well-known Colpitt's modification of the ultra-audio with a slight alteration. In all, or in practically all, such modifications, regeneration is controlled through filament adjustment with

the result that the selection of a detector tube is very essential, some such tubes functioning very poorly. Hence I suggest that one try several detector tubes if possible, retaining that which appears best. Again, when amplifying either a straight ultra-audio on the Miloplex, one should use a rheostat for each tube. You have no doubt noticed a very pronounced ground hum in the circuit until the filament of both the detector and each amplifier is adjusted. When this balance is had, the hum disappears and she starts hitting on all six. If when set the volume is too great, leave the rheostats alone, but reduce your volume by slightly changing the inductive coupling of the oscillator. To tell each of you the exact method for proper tuning of Plexy is a difficult job indeed; in fact better results are obtained if you learn to shift the gears without aid. You will, however, as you gain in experience, discover that just a hair line away is another station ready to hop in and that's when the fun begins.

Radio Digest has mentioned, also published some of the DX results secured with the Miloplex, while I have a bushel basket of letters containing reports which are most pleasing. I have deliberately refrained from mentioning DX work, being content to leave this to the fans, yet you may be interested in knowing that I seek primarily DX during daylight as I consider daylight reception as the supreme test. In my work along this line the greatest distance on loud speaker has been Detroit, which is about 300 miles, while with phones I have heard WGR at Buffalo, WGY at Schenectady and WSB at Atlanta many times. Only yesterday I ploughed through KYW and brought in Omaha at 2:30 p. m., Omaha being 422 miles from Chicago. Please understand each of these are daylight DX results and are not consistent, yet have been accomplished several times, which leads me to believe the Miloplex will travel some in a pinch. Reports received seem to indicate that those centrally located get most of the principal stations, while the usual freak coast to coast results are reported here and there. I say "freak results" for I question very much those circuits that refuse to listen to any station short of Los Angeles every night; they always remind me of the sweet young thing who "wouldn't marry the best man on earth" and finally didn't. Seems to me they are always singing "I hear you calling me," and next day have all their friends "call them."

Cuba will say "Hello" to you on the Plex, but if you expect to hear Cuba every night, build a Spanish circuit, the Miloplex just won't—and that's that. And now, I come "to the end of a perfect day."

Beginning the day (Sunday) by reading a host of fan letters, friend wife said, "Forget Radio and go to church"; so robbing the kid's bank of all its pennies, off

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to the meeting house we go—I secure in the knowledge that as yet I remain "The Mystery Man" but you cannot fool a preacher, for no sooner had the "soft hand" usher seated us than the choir began singing "Listen and ye shall hear," and just to rub it in the minister constantly referred to "A voice in the wilderness." Then, apparently thinking my one minded brain had not grasped the full meaning of their effort, they hammered out the pipe organ encore entitled "Softly a voice is calling." The next time I go to church—well, I don't know what they will place on the Christmas tree for me—I'm going to have them cut out all of those Radio songs; 'taint fair—you know what I mean.

The cook is back. How do I know? Well, I know how well I know; didn't the gas company just call up and say, "please pay" for the sake of the maker of the universe. Gas companies and cooks certainly have a closed union. Let's eat! (TO BE CONTINUED.)

Modulation Transformer

Most of us who have small transmitting sets are not troubled with an overload of ready cash and wish to make most of our own parts. I was unable to locate data on a modulation transformer except such that it would be impossible for the average amateur to build, and therefore used my own ideas with the result that in half an hour and without any expense whatever except for 2 feet of Litz wire, I produced a transformer that gives excellent results.

Some amateurs use a Ford unit and get fair results but the secondary has entirely too much winding, which increases the resistance and ratio out of proportion, so I cut it down as follows:

Take the coil from the case and remove the wax by sharp taps with a light ham-

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mer. Then, take the two secondaries off the primary, and unwind the primary, saving the wire. Cut the core off to 3 1/2 inches in length. Wind the primary back on in four layers, 45 turns to the layer. You will have just enough wire. Tape it well and lay it aside. Next, take one of the secondaries which contains 35 layers, 250 turns-to the layer, of Number 36 enameled wire. With a knife remove the paper from the inside and start unwinding from the inside end. Remove six layers and solder a piece of Litz to the end for the connection. Remove nine layers from the outside, soldering on a Litz wire connection. Tape carefully to protect the fine wire. The core with primary wound on will fit snugly into the secondary. Tape all together solidly, leaving the connections projecting. It can be mounted in any manner you desire.

This transformer will have a ratio of about 27 to 1, primary resistance 3 ohms, secondary direct current resistance 700 to 800 ohms, and works best with a .0025 condenser across the secondary.—Chas. Middleton, La Porte, Ind.

If you put the third step of audio on your set, fixed condensers across the windings of the last transformer will help stop howling if any occurs.

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Audio Amplification for the Flewelling Set

Part III—Use of Filter in the Circuit

By E. T. Flewelling

IN LAST week's issue we discussed amplification and the Flewelling super-circuit up to the point of using a suitable filter circuit in connection with the amplifier. It has often been said of the Flewelling circuit that it consists of nothing more nor less than a straight regenerative circuit, having incorporated in it

its maximum and returning in the same manner to its zero point.

Speaking in general, such a voltage or current chain would be a more or less easy thing to filter, depending upon the apparatus used and our individual skill. Unfortunately, the writer believes we have a more difficult proposition on our

sults, and an effort to keep the set and its amplifier as free from each other electrically as is possible, would be the writer's idea of how to build an amplifier for the Flewelling circuit. The use of separate A and B batteries may sound like a hardship, but with such tubes as the UV-199 or WD-11 or WD-12, is really

vious articles on audio frequency amplification for the Flewelling circuit were purposely meant to emphasize the great and very apparent need for simplicity of construction, because it has so many times been demonstrated that the more clean-cut the construction of a set is, the better the results that the set will give us.

The writer has received scores of letters in which the statement is made "I do not believe that I am getting the maximum results from my set; can you tell me what to expect in the way of long distance reception?" We haven't the space for a lengthy discussion of this point, but it might help a bit if I say that the set shown in the photographs in the first article is a plain regenerative set with three stages of audio frequency amplification. This amplification does not help the set out much so far as distance work is concerned, so that for this purpose it really amounted, aside from volume of sound delivered, to a single-tube set, yet it was found very possible to bring in 400, 500 and 600-mile stations on the ground alone, without the use of any other antenna than the set itself in various parts of the eastern United States during the month of August, when reception was not at its best anyway. This, then, is a convenient manner in which we can gauge our sets and is mentioned in the hope that some of our readers who try it may gain a little by such test, and if they care to go to the trouble, will write to the Digest, telling what they have been able to do.

Our articles have really emphasized the desirability of constructing our Radio sets along the line of what might really be called "wireless Radio sets." Sounds like a joke, doesn't it? But imagine the lack of confusion and the nice, clean-cut appearance of such a set, to say nothing of its vastly improved ability. Certainly it does seem worth our while to keep this idea in mind when we are "rolling our own."

(THE END.)

AN ENTHUSIASTIC FLEWELLING USER

Gentlemen:

We finished building a one condenser super-set some time ago and must say that the results are wonderful. We can receive from Detroit, Schenectady, Chicago, Pittsburgh and a few other points on a piece of wire about 30 feet long which is hung around the room. We have never built a set that is as sensitive, or as critical, and yet so easily controlled. Using the ground wire only, long distance reception and amplification are fine. We have not as yet had any success in amplifying signals from the Flewelling detector but hope to in the near future.

It is the ideal set for places where erecting an outdoor aerial is not allowed.

We want to thank Mr. Flewelling and the Radio Digest for showing us how to get the most out of Radio at the least expense.

Very truly yours,
The Battery Shop.

an Eaton oscillator to be used as a source of the so-called variation frequency employed with super-regenerative circuits. One of the several very easy ways to show that the Eaton oscillator is not incorporated in the circuit is to endeavor to operate a filter circuit satisfactorily before audio amplification. Were an Eaton oscillator incorporated in the circuit and used as a source for the variation frequency, the variation frequency would show upon examination a more or less sinusoidal curve, that is, the frequency would rise from zero, following more or less closely the form of a sine curve to



hands when we take up the matter of filtering out the variation frequency for the Flewelling circuit. This variation frequency is caused not by an Eaton oscillator, or other similar arrangement, but as has been said so many times, by the blocking and freeing of the tube action working in connection with the charge and discharging of the large .006-mfd. condenser, and this frequency is not believed to follow a sinusoidal form, but is more flat and subject to—perhaps an easy way of saying it—sharp corners and changes. Experience will teach that this is an extremely difficult type of output to filter.

Use of High Resistances

In general, the writer would recommend the use of audio amplification with the Flewelling circuit without the use of a filter, the variation frequency whistle being subdued as much as possible by the use of separate B batteries and A batteries for the amplifier by setting the grid leak so that the variation frequency does not bother. The use of high resistances, such as variable grid leaks, across the transformer terminals, where experience shows that improved reception re-

preferable, as it means less load and longer life for the dry batteries generally used with these tubes.

Use Standard Types of Filters

It is an impossibility to give the constants for a filter and feel that they would be of any value to readers, because, aside from the difficulty of wave form spoken of above, their values would not be alike for various sets, and success with filters depends almost as much upon the experience and skill of the operator as it does upon more or less accurate descriptions. For those readers who wish to carry out the filter idea, I think it best to simply refer them to any of the standard or usual types of filters.

As the writer sees it, the secret—and there isn't any—of correct amplifier, or for that matter, correct set or detector construction, was shown in the photographs accompanying the first article in this series, and he believes that a close study of the constructional details of the set shown will well repay one's time. It has often been said that "simplicity is the keynote to efficiency." Our two pre-



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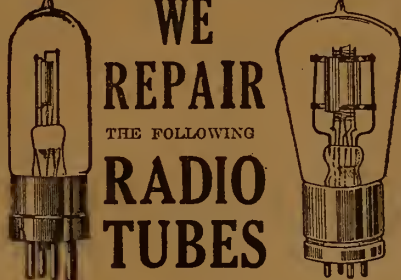
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This new instrument connected to your present receiving set with one wire enables you to easily bring in both the long and short wave stations which you cannot get with your present equipment. It also enables you to eliminate that local interference so you may listen to distant stations.

Copyrighted diagram and complete instructions for building and operating this instrument, 50c, or with all parts, including Condenser, Coils, Switches, and Panel, \$8.50. Complete instrument, \$15. All goods prepaid.

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Questions and Answers

DV-6A Tube

(4865) HCG, Kerlin, Ark.
 In the August 11 issue you give a diagram of a simplex circuit using a variable condenser as the only tuner. I have a DV-6A DeForest tube. Will it give satisfaction and if so what voltage on filament and plate? Could a variometer be used in place of the honeycomb coil? What would be the range with this set with 180 foot aerial? Would this set be very selective using only a condenser for tuning?

What length of aerial would be efficient for a single tube reflex, how high from the ground? Is the lead-in from the single wire considered in the length given for an aerial?

In soldering connections should I solder the connections to the fixed Micadon condensers? Will this harm the condenser?

Should I use the .0005 fixed condenser with my DV-6A DeForest tube, and what grid leak? Will the Bradlystat control the current for a DV-16A.

What range of wave length would I get, using a 23-plate vernier condenser in the simplex as pictured in August 11 issue honeycomb coil to be used? What length of aerial will I need to send code 10 miles? Would I need a license to send 10 miles? This distance would not put me out of the state? What difference would a variometer make to be used to send code?

A.—A DV-6A DeForest tube with 45 volts plate potential can be effectively employed in the described circuit.

A variometer can be substituted for a honeycomb coil. The receiving range will approximate 1,200 miles.

A single circuit hook-up is not distinctive for selectivity although where there are no local broadcasting stations it should prove sufficiently so for satisfactory reception.

A 150-foot antenna with lead-in is efficient. Construct it at as great a height as possible.

If carefully done it is desirable to solder condenser connections. The fixed condenser should be .0005 mfd. with a 2-megohm leak.

A Bradlystat will be effective for tube control.

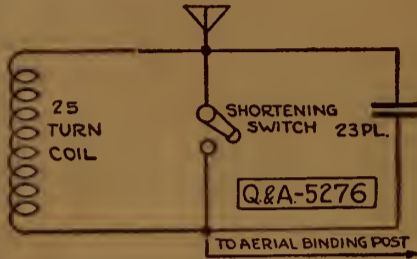
Range of wave lengths from 200 to 550 meters.

For transmission of code at a 10-mile range antenna can be 100 feet in length. A license is required for such transmission.

A variometer in the circuit under discussion would afford more selective tuning.

Wave Trap

(5276) JFE, Humphrey, Neb.
 Kindly advise, by diagram if possible, the making and hook-up of a wave trap that can be connected to a two-stage Armstrong regenerative set.



A.—We are herewith presenting sketch of a simple wave trap arrangement to be used in antenna circuit. Constructional details and method of operation appeared on page 14 of December 9, 1922, issue of Radio Digest.

Honeycomb coils of proper values can be used interchangeably for elimination of specific wave lengths.

Amateur Transmission

(5106) DMCC, Philadelphia, Pa.
 Would a single wire antenna of copper ribbon be suitable for transmission or would you advise an antenna of greater capacity than a single wire affords?

Would it be practical to supply the plate current for a three-tube transmitter, (1 oscillator, 1 modulator, and 1 amplifier), from a B battery of 135 volts or greater?

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as I am unable to install a D. C. generator?

Would the radiation from this be as great as if a D. C. generator was used?

Would it be possible with any system of filters or rectifiers to supply the plate current from a spark coil (operated by a storage battery) suitable for phone transmission; could you publish hook-up for same? Can a Ford coil be used efficiently as a modulation transformer?

A.—Answering your inquiry in the matter of transmitting equipment we are advising that a two or three wire antenna is preferred to a single wire construction because of greater capacity.

It would be possible to supply plate current for described transmitter from a 135 volt B battery for a short time. However, transmitting tubes require quite a lot of current, so your B batteries will not last very long unless they are of the storage type. Radiation will be equal to that of D. C. generator as long as batteries last.

It would not be possible to supply plate current as suggested. However, rectified A. C., properly filtered, can be used for phone transmission.

The ratio of a Ford spark coil is too high to permit its use as a modulation transformer.

Apparatus Construction

(4915) NWH, Toledo, Ohio.

I would like to have you give a sketch and amount of wire used in the Acme and D.X. Radio frequency transformers. Have been a reader of your newspaper ever since it has been on the market, and find it very good in every respect to a man who is in doubt about anything in Radio.

A.—In the matter of your request for constructional details of Acme and DX Radio frequency transformers we are advising that being a manufactured apparatus,

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ratus, it does not come within the scope of our service.

In view of the extensive and heavy advertising campaign entailed in placing such apparatus on the market Radio Digest does not consider it ethical to extend its service to encroach upon the domain of manufacturers of commercial receiving sets and equipment.

Yet we hope for the privilege of serving you helpfully in any matter within the spirit of our gratuitous service.

Radio Direction Finding

(5258) JAB, Detroit, Mich.

Being a Radiophan and a reader of the Radio Digest I am taking the liberty of enclosing a clipping which appeared in one of the Detroit papers today regarding the recent naval disaster along the California coast. I have questioned several fans for the solution of the Radio problem referred to in the clipping, but without success.

I will appreciate it very much if you will enlighten me as to why a Radio station on shore could determine the location of a vessel at sea when the commanders of that vessel could not determine their own location even with their advanced knowledge of navigation.

A.—Answering your inquiry with reference to the clipping, we are stating in explanation that practically all of the Pacific and Atlantic seaboard are lined with what are known as Radio Compass stations, which send out test signals. These signals are intercepted by loop antenna systems, or direction finders as they are termed, on board boats. Location of a boat's position is merely a matter of using the directional properties of the loop to determine its location with respect to the shore transmitting station.

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 Yours truly,
 Mr. Harvey F. Reese.

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Radiophone Broadcasting Stations

Corrected Every Week—Part I

AA3, Denver, Colo. 440 meters. 1,500 m. Fitzsimmons Gen. Hospital. (Educational Dept. U. S. Army). Fri, 8-9 pm, music, entertainment. Mountain.

AG8, Canton, O. 425 meters. 500 m. 11dgrs. 135th Field Artillery O. N. G. Wed, Fri, music. Sun, church services. Eastern.

AS6, San Antonio, Tex. 360 meters. 200 m. U. S. Army. Ft. Sam Houston. Mon, Thurs, irregular.

AV7, St. Paul, Minn. 400 meters. 500 m. 6th Inf. U. S. Army. Nat'l Guard. St. Paul Armory. Irregular schedule. Central.

AW5, Dayton, O. McCook Field, U. S. Army. Experimental work only.

BE1, Tacoma, Wash. 400 meters. 100 m. Camp Lewis, U. S. Army. Third Signal Co. Discontinued indefinitely.

CFAC, Calgary, Alta., Can. 430 meters. 1,000 m. Calgary Herald. Club, "Night Hawks." Daily ex Sun, 12:30 pm, 3:30-4:30, 7:45-8:45, Thurs, 10:30, music, entertainment, news, market, weather. Mountain.

CFCA, Toronto, Ont., Can. 425 meters. 1,000 m. Toronto Star. Daily ex Sun, 12 m, weather, news, stock; 5:30-6 pm, news. Daily ex Sun, Wed, 8-9 pm, music. Sun, 7 pm, church services. Eastern.

CFCE, Montreal, P. Q., Can. 440 meters. 1,000 m. Marconi Co. Daily 1-1:45 pm. Monday, Wed, Fri, 7:30-9 pm, music, entertainment, reports. Eastern.

CFCH, Inouels Falls, Ont., Can. 400 meters. 500 m. Abilibi Power & Paper Co., Ltd. Daily, 9 pm, reports, music, entertainment. Experimental station. Eastern.

CFCL, Quebec, Que., Can. 410 meters. 50 m. La Cie de L'Evnement.

CFCK, Edmonton, Alta., Can. 410 meters. 500 m. Radio Supply Co. Daily ex Sun, 8-8:45 pm, music. Sun, 3:30-4:30 pm, concert. 400 meters. Mountain.

CFCL, Victoria, B. C., Can. 310 and 400 meters. 500 m. Centennial Methodist Church. Slogan, "Where Religion Cheers." Tues, Fri, 8:30-10:30 pm, concerts, lectures. Sun, 11 am, 7:30 pm, church services. Pacific.

CFCN, Calgary, Alta., Can. 275, 440 meters. 1,500 m. W. V. Gran. Radio. Slogan, "Voice of the Rockies." Mon, 11 pm, music, Wed, 10-11 am, dance music. Sat, 10-12 pm, dance music. Test program, Sat, after midnight. Mountain.

CFCO, Bellevue, P. Q. 275 meters. 300 m. Semmelmaack-Dickson, Ltd. Daily ex Sat, Sun, 9:45-10:30 pm, news, markets, reports, sports, time, music. Sat, 9:30-11 pm, music. Sun, 9:15-10:45 pm, sacred music. Eastern.

CFCW, London, Ont., Can. 420 meters. 50 m. The Radio Shop. Tues, Thurs, Sat, 8:30-9:30 pm, music, entertainment. Eastern.

CFCC, Sask., Sask., Can. 400 meters. 500 m. The Electric Shop, Ltd. Slogan, "The Hub City of the West Where No. 1 Northern Hard Wheat Grows." Daily ex Sun, 1-1:30 pm, markets, reports, music. Mon, Tues, Thurs, Fri, 7:30-9 pm, news, reports, markets, entertainment. Sun, 9-9:45 pm, church services. Mountain.

CFUC, Montreal, P. Q., Can. 400 meters. 1,000 m. Univ. of Montreal.

CHCB, Calgary, Alta., Can. 410 meters. 1,000 m. W. V. Gran. Radio Ltd. (Morning Alberta.) Daily ex Sat, 8:45-9:45 pm, news, stock quotations, music. Mountain.

CHCD, Quebec, Que., Can. 415 meters. 50 m. Canadian Wireless and Electric Co. Mon, 7:30-9 pm; Wed, 8-9; Sat, 8-10, music. Eastern.

CHCE, Victoria, B. C., Can. 310 and 400 meters. 500 m. Western Canada Radio Supply, Ltd. Daily ex Sun, 4:30-5:30 pm, 7:30-9:30 pm, Sun, 9-10 pm, music, entertainment. Pacific.

CHYC, Montreal, Que., Can. 410 meters. 1,500 m. Northern Elec. Co. No regular schedule.

CJCA, Edmonton, Alta., Can. 450 meters. 1,000 m. Education Journal, Ltd. Slogan, "The Sunniest Spot in Sunny Alberta." Club, "Igloo Hut." Daily ex Sun, 12:30 pm, weather, markets, 7:30-8 pm, Children's half hour. 8:30-9:30 pm, concert, reports. Mountain.

CJCD, Toronto, Canada. 410 meters. 200 m. T. Eaton Co. Daily ex Sat, Sun, 4-4:30 pm, music. Eastern.

CJCE, Vancouver, B. C., Can. 420 meters. 150 m. Sprout-Shaw Radio Co. Daily ex Sun, 12:30-1:30 pm, 3:30-5, 8-10, music, news. Pacific.

CJCI, St. John, N. B., Can. 400 meters. 500 m. Maritime Radio Corp., Ltd. Mon, Wed, Fri, 7:30-9 pm, music. Sat, 9-11 pm, music. Eastern.

CJCK, Ogdun, Alta., Can. 400 meters. 500 m. Percival W. Shachtel. Slogan, "The Best Town in the West." Tues, Thurs, 9:45-11 pm, music. Sat, 8:45-10 pm, music. Mountain.

CJCG, London, Ont., Can. 430 meters. 500 m. London Free Press. Daily ex Sun, 9:30-10 am, 12-1 pm, 3:30-6, news, market and weather, 8-9, music, entertainment. Eastern.

CKAC, Montreal, Que., Can. 430 meters. 1,000 m. La Presse. Daily ex Sat, Sun, 4 pm, music; 4:30, weather, markets, stocks. Tues, Thurs, Sat, 7 pm, children's hour; 7:30, concert. Sun, 4:30 pm, sacred concert. Eastern.

CKCD, Vancouver, B. C., Can. 410 meters. 1,000 m. Vancouver Daily Province. Daily ex Sun, 3:30-9:30 pm, music, news, entertainment. Pacific.

CKCE, Toronto, Ont., Can. 450 meters. 1,000 m. Can. Ind. Telephone Co. Daily ex Sun, 11:55 am-12 m. Arlington Time Signals. Eastern.

CKCK, Regina, Sask., Can. 420 meters. 1,500 m. Leader Pub. Co. "The Queen City of the West." Daily ex Sat, Sun, 9:54, time; 10:10-30 am, 1:15-2 pm, 7:30-8:15. Tues, 7:30-9 pm, music, entertainment, news, market, weather. Sat, silent night. Sun, 9, service. Mountain.

CKCH, Hamilton, Ont., Can. 410 meters. 100 m. Wentworth Radio Supply Co. Ltd. Slogan, "In the Garden of Canada." Mon, Wed, Fri, 8-9 pm, music, entertainment. Sun, 7-8 pm, church services. Eastern.

CKY, Winnipeg, Man., Can. 450 meters. 1,000 m. Manitoba Tel. Co. Daily ex Sun, 12:30-1:45 pm. Tues, Thurs, Fri, 8:15-10, music, entertainment, weather. Sun, 7 pm, church services; 9, sacred concert. Central.

CYB, Mexico City, Mex. 370 meters. 1,000 m. El Buen Tono. Tues, Sat, 7:30-9 pm. Thurs, 8-10 pm, concert. Mexican time.

KDKA, E. Pittsburgh, Pa. 326 meters. 2,000 m. Westinghouse Elec. & Mfg. Co. Daily ex Sun, 10-10:15 am, 12:30-1 pm, music; 6-10 pm, news, features, markets, concert; 9:55-10:10 pm, 10:45 am, church services; 1:30 pm, Bible story; 3:45 pm, concert; 4:45 pm, 7:30, church service. Eastern.

KDPM, Cleveland, O. 270 meters. Westinghouse Elec. & Mfg. Co.

KDPT, San Diego, Calif. 244 meters. 500 m. Southern Elec. Co. Daily ex Sun, 7-7:30 pm, news, weather, concerts, lecture. Tues, Sat, 8-10 pm. Sun, 11:30-12:30 pm, sermon. Pacific.

KDYL, Salt Lake City, Utah. 360 meters. 1,800 m. Newhouse Hotel. Daily ex Sun, 6:30-8 pm, news, music, entertainment. Mountain.

KDYM, San Diego, Calif. 286 meters. Savoy Theater.

KDYQ, Portland, Ore. 360 meters. 200 m. Oregon Institute of Technology. Slogan, "The Radio School." Educational programs.

KDYS, Great Falls, Mont. 360 meters. 1,000 m. Great Falls Tribune. Tues, Fri, 8-9 pm, concert.

KDYW, Phoenix, Ariz. 360 meters. 100 m. Smith Hughes & Co. Temporarily discontinued.

KDYZ, Honolulu, T. H., Hawaii. 360 meters. 500 m. Honolulu Star-Bulletin Co., Ltd. Daily ex Sun, 12:15-1:15 pm, reports; 6:30-7:30 pm, entertainment, music, talks. Sun, 11 am-12:15 pm, church services. 12th Meridian.

KDZB, Bakersfield, Calif. 240 meters. 500 m. Frank Siefert. Daily ex Sun, 8-9 pm, reports, music. Sun, sacred program, irregular. Pacific.

KDZE, Seattle, Wash. 455 meters. 1,000 m. The Rhodes Co. Mon, Wed, Fri, 8:30-10:30 pm, music; Fri, 12:30-1:30 pm, meeting; Sat, 2-3 pm, music. Pacific.

KDZF, Los Angeles, Calif. 278 meters. Automobile Club of Southern California. Not operating yet.

KDZL, Wenatchee, Wash. 360 meters. 700 m. Elec. Supply Co. Temporarily discontinued.

KDZM, Reno, Nev. 360 meters. 50 m. Nevada Machine & Elec. Co. (Nevada State Journal). Sun, 7-8 pm, Pacific.

KDZO, Denver, Colo. 360 meters. Nicholas Academy of Dancing.

KDZR, Bellingham, Wash. 261 meters. 200 m. The Bellingham Pub. Co. Mon, Wed, Fri, 7-8:30 pm, music. Tues, Sat, Sun, 7-8 pm, Pacific.

KDZT, Seattle, Wash. 360 meters. 50 m. Seattle Radio Assn.

KFAD, Phoenix, Ariz. 360 meters. 200 m. McArthur Brothers. Daily ex Sun, 7:30-8:30 pm, news, weather, stock reports, music. Mountain.

KFAE, Pullman, Wash. 360 meters. 1,500 m. State College of Washington. Mon, Wed, Fri, 7:30-9 pm, lectures, music, readings. Pacific.

KFAF, Denver, Colo. 360 meters. 1,500 m. Western Radio Corp. Slogan, "Voice from the Rockies—Out Where the West Is." Mon, Tues, Fri, Sat, 8-9 pm; Thurs, 7:30-8, music, reports, news. Wed, silent. Mountain.

KFAJ, Boulder, Colo. 360 meters. 800 m. Univ. of Colo. Tues, Thurs, Sat, 9 pm, time, music, addresses by faculty. Sat, 2:30-5 pm, football. Mountain.

KFAN, Moscow, Ida. 300 meters. 200 m. The Electric Shop. Tues, Thurs, Sat, 7:30-8:30 pm, music, reports. Sun, church services. Pacific.

KFAP, Butte, Mont. 360 meters. Standard Pub. Co.

KFAR, Hollywood, Calif. 280 meters. Studio Lighting Service Co.

KFAU, Boise, Ida. 270 meters. 200 m. Boise H. S. Daily ex Sun, 3-3:30 pm, markets, weather, news. Wed, Fri, 8-9 pm, concert. Mountain.

KFAV, Venice, Calif. 258 meters. 50 m. Abbot-Kinney Co. Mon, Tues, Wed, Fri, 8:30-9:30 pm, music. Pacific.

KFAW, Santa Ana, Calif. 280 meters. 100 m. Radio Dan. Daily ex Sun, 4:30-5 pm, news, reports, music. Mon, Thurs, 6:30-7:30 pm, concert. Pacific.

KFAY, Medford, Ore. 360 meters. 500 m. Virgin Radio Service. Temporarily discontinued.

KFBB, Havre, Mont. 360 meters. 150 m. F. A. Buttery Co. Daily ex Sun, 12:30 pm, agriogram, weather, news. Tues, Fri, 8-9:30 pm, music. Mountain.

KFBC, San Diego, Calif. 278 meters. 100 m. W. K. Azbill. Thurs, Sun, 8-9 pm, Bible lesson, sermon. Pacific.

KFDS, San Francisco, Calif. 360 meters. John D. McKee.

KFEL, Lincoln, Neb. 240 meters. Neb. Radio Elec. Co. 440 meters. Ark. 300 meters. 400 m. Gilbreath & Stinson. Slogan, "Southern Gateway to the Ozarks." No regular schedule. Central.

KFDX, Shreveport, La. 360 meters. First Baptist Church.

KFDY, Brookings, B. D. 360 meters. S. D. State College of Agri. & Mech. Arts. Mon, Sat, 8:30 pm, music. Tues, Thurs, 11 am, music, lectures, news. Central.

KFDZ, Minneapolis, Minn. 360 meters. Harry O. Iversen.

KFEC, Portland, Ore. 300 meters. 75 m. Meier & Frank Co. Inc. Daily ex Sun, 12 m, weather, reports; 4-5 pm, music; 6:30 pm, weather, crop, markets, reports. Thurs, 9-10 pm, concert. Sat, 11 am 12 m, children's hour. Pacific.

KFEL, Denver, Colo. 360 meters. Winncr Radio Corp. Daily ex Sun, 9 am, 10, 11, 11:45, stock reports; 3-4 pm, music. Mon, Fri, 9-10 pm, 12-1 am, concerts. Sun, 9-10 am, church services. Mountain.

KFEB, Oak, Neb. 360 meters. J. L. Scroggin. No regular schedule.

KFER, Port Dodge, Ia. 231 meters. Auto Electric Service Co.

KFEV, Douglas, Wyo. 263 meters. 500 m. Felix Thompson Radio Elec. Shop. Slogan, "You Tell 'Em." Weather reports and special warnings. Mountain.

KFEW, Minneapolis, Minn. 261 meters. 600 m. Augsburg Seminary. Tues evening, music. Central.

KFEY, Kellogg, Ida. 360 meters. 50 m. Bunker Hill & Sullivan Mining Co. Slogan, "Voice of the Coeur D'Alcours."

KFEZ, St. Louis, Mo. 360 meters. 800 m. American Society of Mech. Engrs. Thurs, 8:30-9:30 pm, engineering program. Central.

KFEB, Boise, Ida. 273 meters. 70 m. Jenkins Furn. Co. (Owyhee Hotel). Daily, 8-9 pm, concert. Mountain.

KFFE, Pendleton, Ore. 360 meters. 100 m. Eastern Ore. Radio Co. Daily ex Sun, 8:30-9:30 pm, music. Pacific.

KFFO, Hillsboro, Ore. 223 meters. Dr. E. H. Smith. Daily, 6-7 pm, music, sports, news. Fri, 9-10 pm, Chamber of Commerce Community Program. Pacific.

KFI, Los Angeles, Calif. 49 meters. 2,000 m. John C. Anthony, Inc. Daily ex Sun, 5-6 pm, 6:45-7:30 pm, 8-11 pm, Wed, Fri, Sat, 8-12 pm. Sun, 11:30-11:45 am, 4-5 pm, 6-7:30, 8-11 pm. Pacific.

KFIB, St. Louis, Mo. 24 meters. Franzen W. Johnson.

KFID, Jola, Kans. 248 meters. Hwa Arbuckles Garage. Daily, 5:15-5:45 pm. Tues, 9-10 pm. Eastern.

KFIF, Portland, Ore. 360 meters. Benson Tenth Student Body.

KFIK, Gladbrook, Iowa. 234 meters. Gladbrook Electric.

KFIL, Louisburg, Kans. 234 meters. 150 m. Windisch Elec. Farm Equip. Co. Wed, Sat, 8-10:30 pm. Sun, 11-12 m, church services. Central.

KFIO, Spokane, Wash. 252 meters. North Central High School.

KFIQ, Billings, Wash. 224 meters. 299 m. Yakma Valley Broadcasting Assn. Slogan, "The Blaine That Will Make 24 Pantries." Mon, Wed, Fri, 7-8:30 pm, concert. Sat, 7:30-8 pm, S. S. League. Sun, 4-5 pm, music. Pacific.

KFIU, Juneau, Alaska. 226 meters. Alaska Elec. Light & Power Co.

KFIV, Pittsburg, Kans. 240 meters. V. H. Broyles.

KFJX, Independence, Mo. 240 meters. Reorganized Church of Jesus Christ of Latter Day Saints.

KFJY, Seattle, Wash. 236 meters. Erott Laboratorles.

KFIZ, Fond du Lac, Wis. 273 meters. Daily Commonwealth and Oscar H. Huelman.

KFJA, Grand Island, Nebr. 244 meters. Central Power.

KFJB, Marshalltown, Iowa. 248 meters. 50 m. Marshall Elec. Co. Tues, Fri, 7:30-10 pm. Central.

KFJC, Seattle, Wash. 270 meters. Post Intelligencer. Slogan, "Hello Folks." Daily ex Sun, 4-5 pm, music; 8:30-10, programs, dance music. Pacific.

KFJD, Greeley, Colo. 236 meters. 300 m. Weld County Printing & Pub. Co.

KFJE, Oklahoma City, Okla. 252 meters. 120 m. National Radio Mfg. Co. Slogan, "The Tired Land." Daily ex Sun, 3 pm, concert; 6:30, baseball, football, police, announcements. Tues, 9 pm, concert. Sun, 3 pm, concert. Central.

KFJH, Selma, Calif. 273 meters. The Sugar Bowl.

KFJI, Astoria, Ore. 252 meters. 50 m. E. L. Marsh and Liberty Theater. Daily ex Sun, 7-8 pm. Sun, 9:30-10:30 pm. Pacific.

KFJJ, Carrollton, Mo. 236 meters. Carrollton Radio Shop.

KFJK, Bristow, Okla. 233 meters. Delano Radio & Elec. Co. Daily ex Sun, 3-4 pm, music. Thurs, 8-9:30 pm, music. Sun, 7:30 pm, church services. Central.

KFJL, Ottumwa, Ia. 242 meters. 50 m. Hardsog Radio Club. "Billed Boys." Mon, Wed, Fri, 7:30-8:30 pm. Central.

KFJM, Grand Forks, N. D. 229 meters. 500 m. University of North Dakota.

KFJR, Stevensville, Mont. 258 meters. 100 m. Ashley C. Dixon & Son. Slogan, "The Bitter Root Valley Broadcasting Station." Fri, Sun, 8-9 pm, music readings. Mountain.

KFJU, Kearney, Neb. 234 meters. 50 m. Central Power Co.

KFJV, Dexter, Iowa. 224 meters. 50 m. Thomas H. Warren. Daily ex Sun 9:15 am, 10:25, 1:45 pm, weather, markets. Tues, Fri, 8:30 entertainment. Central.

KFJW, Rowanda, Kans. 266 meters. 50 m. Le Grande Radio Co. Mon, Tues, Thurs, Sat, 7-8 pm; Fri, 8-11 pm; Sun, 1:30-2 pm. Central.

KFJX, Cedar Falls, Iowa. 229 meters. 250 m. Iowa State Teachers College.

KFJY, Fort Dodge, Iowa. 216 meters. 250 m. Tun-wal Radio Co. Slogan, "Fort Dodge, Iowa, Where Corn is King." Daily ex Sun, 8 am, 8:30, 9:30, 10:30, 11:30, 12:20 pm, weather, markets. Sun, 11-12:20 pm, church services. Special evening programs. Central.

KFJZ, Fort Worth, Texas. 254 meters. 100 m. Texas National Guard. 12th Cavalry. Wed, 8:30-9:30 pm. Sunday, 8:30-10 pm, program. Central.

KFKA, Greeley, Colo. 218 meters. Colorado State Teachers College.

KFKB, Millford, Kans. 236 meters. 1000 m. Brinkley-Jones Hospital Assn. Slogan, "Watch Out, Here Comes Brinkley." Daily ex Sun, 10-12 midnight, music, lectures. Central.

KFKH, Lakeside, Colo. 226 meters. Denver Park Amusement Co. Closed for winter.

KFKQ, Conway, Ark. 224 meters. 600 m. Cowway Radio Lab. Daily ex Sun, 12m, weather, program. Tues, Fri, 8 pm, music. Sunday evening, church service. Central.

KFKV, Butte, Mont. 283 meters. 250 m. F. F. Gray.

KFKX, Hastings, Neb. 256 meters. 1,500 m. Westinghouse Elec. & Mfg. Co.

KFKZ, Colorado Springs, Colo. 234 meters. 50 m. Nassour Bros. Radio Co.

KFLA, Butte, Mont. 233 meters. 25 m. Abner B. Willson.

KFLB, Benning, Mich. 248 meters. 100 m. Signal Elec. Mfg. Co.

KFLD, Franklinton, La. 234 meters. 100 m. Paul E. Greenlaw.

KFE, Denver, Colo. 268 meters. National Educational Service. Daily, 7-7:30 pm, 11-12 midnight. Broadcasts, reports, schools on request. Mountain.

KFLH, Salt Lake City, Utah. 261 meters. 250 m. Erickson Radio Co. Inc.

KFLP, Cedar Rapids, Iowa. 240 meters. 50 m. Everett M. Foster.

KFZ, Spokane, Wash. 283 meters. 300 m. Doerr-Mitchell Elec. Co. Slogan, "In the Heart of the Inland Empire." Tues, Fri, 7:30-9 pm, music. Sun, 6-7 pm. Pacific.

KGB, Tacoma, Wash. 252 meters. Tacoma Daily Ledger. "This is KGB in Tacoma, Washington, the Lumber Capital of America." Mon, Wed, Fri, 7-9 pm. Pacific.

KGG, Portland, Ore. 360 meters. 500 m. Hallock & Wilson Radio Service. Slogan, "The Rose City." Daily ex Sun, 5-6 pm, music, entertainment. 7:30-8 pm, reports. Sat, 3-9 pm, answers to Radio questions. Sun, Wed, 9-10 pm, music. Pacific.

KGN, Portland, Ore. 360 meters. 100 m. Northwestern Radio Mfg. Co. Irregular schedule.

KGU, Honolulu, Hawaii. 360 meters. 150 m. Marlon A. Mulroy. The Honolulu Advertiser. Daily, 7:30-9 pm. Thurs, Sat, special program. 150th meridian. (2 1/2 hours later than Pacific.)

KGW, Portland, Ore. 492 meters. 1,500 m. Oregonian Pub. Co. Slogan, "KGW, Keep Growing Wiser." Daily ex Sun, 11:30 am, weather; 3:30-4 pm, woman's program; 7:30 pm, markets, weather. Daily ex Sat, Sun, 8-9 pm, music, entertainment. Mon, 9:30 pm, community program. Wed, Fri, 9 pm, lecture. Tues, Wed, Thurs, Sat, 10 pm, dance music. Fri, 10:30 pm, float ovals. Sun, 6 pm, church service; 7 pm, concert. Pacific.

KGY, Lacey, Wash. 258 meters. 250 m. St. Martin's College. Slogan, "Out Where the Cedars Meet the Sea." Tues, Fri, Sun, 8:30-9:30 pm, news, concert, lecture, bedtime story. Pacific.

KHJ, Los Angeles, Calif. 395 meters. 2,000 m. Los Angeles Times. Daily ex Sun, 12:30-1:15 pm, 2:30-3:30, 6:45-7:30, 8-12 midnight. Sun, 10-11 am, 8-10 pm. Pacific.

KHQ, Seattle, Wash. 360 meters. Louis Wassmer.

KHJ, Stockton, Calif. 360 meters. 100 m. Gould. The Light Tower. Daily ex Sun, 5-6 pm, concert. Mon, Wed, 9-10 pm, concert. Sun, 10-11 am, church services. Pacific.

KJR, Seattle, Wash. 283 meters. 1,500 m. Northwest Radio Service Co. Daily ex Sun, 5:30-6:15 pm, reports. Mon, 7:30-8:30 pm, music. Fri, 8:30-9:30 pm, concerts, lecture, bedtime stories. Pacific.

KKS, Los Angeles, Calif. 360 meters. 500 m. Bible Inst. of Los Angeles. Tues, 7:30 pm. Thurs, 8-9, sacred music, lectures, etc. Sun, 11:30-12:30 pm, 6-6:45, 3-9, church services. Pacific.

KLN, Del Monte, Calif. 261 meters. Monterey Elec. Shop. Discontinued temporarily.

KLS, Oakland, Calif. 360 meters. 1,500 m. Warner Bros. Radio Supply Co. Daily, 11:30-1 pm. Fri, 8-9 pm. Sun, 12-1 pm. Pacific.

KLX, Oakland, Calif. 360 meters. 500 m. Oakland Tribune. Daily ex Sun, 3:30-4:30 pm, music; 7-7:30 pm, news, entertainment. Tues, 8-9 pm, Fri, 9-10 pm, Pacific.

(NOTE—The second part of the station data list will appear next week.)

CHALLENGE!

ONE DOLLAR will be paid to the Radiophon submitting the most errors in any one station's listing. Letters must reach Radio Digest office not later than one week from date of issue corrected. Readers are not limited to correcting one station. Turn in corrections for as many stations as you can find —If you can find errors! Use separate sheet of paper for each station submitted and place name and address on each sheet.

That's just how sure Radio Digest is that this Radiophone station directory is correct! To make the challenge fair for everyone, broadcasting stations and their employees are barred from this offer. Why? Because the broadcasters are the source of all the data given herein. They are (or should be) interested enough to answer the inquiry sent them every time data on their station appears. This inquiry contains a proof of their last listing and must either be corrected or oked as correct and returned to the Digest. Nevertheless, sometimes the stations

are careless and mistakes are made. But Radio Digest is so sure of the exactness of this directory that this challenge is made unconditionally.

With reference to the directory: It appears in four parts, serially continuously; the first three parts are station data listings, arranged alphabetically; the fourth part is a state, city index of stations. The information contained in each station data listing is given in the following order: Call letters, city, state, wave length used, estimated sure range (by Radio Digest) in miles, owner's name, slogan used, if any, name of listener in "club," schedule of operating hours, and kind of time used.

Four successive issues of Radio Digest will give one the most complete and accurate list of broadcasting stations obtainable. This service is original with this publication, and has been maintained from the start. Right of reproduction without permission of any or all of the data contained herein is denied.

KFBE, San Luis Obispo, Calif. 360 meters. 50 m. R. H. Horn. Mon, Wed, Fri, 4:30-5:30 pm. Pacific.

KFBG, Tacoma, Wash. 360 meters. First Presbyterian Church. Sun, 11 am-12:15 pm, 7:30-9. Pacific.

KFBK, Sacramento, Calif. 283 meters. 300 m. Kimball-Upson Co. Slogan, "Heart of California." Daily ex Sun, 6-6:45 pm, concert, news, codes. Wed, 8-9:30 pm, concert. Pacific.

KFBL, Everett, Wash. 224 meters. 50 m. Leese Bros. Daily ex Sun, 7:15-8:15 pm. Sun, 2-3 pm. Pacific.

KFBS, Trinidad, Colo. 360 meters. 75 m. Chronicle News & Gas & Elec. Supply Co.

KFBV, Laramie, Wyo. 283 meters. Bishop N. S. Thonas.

KFCB, Phoenix, Ariz. 238 meters. Niclson Radio Supply Co. Daily, 7-7:30 pm, bedtime stories. Mountain.

KFCD, Salem, Ore. 360 meters. 100 m. Salem Elec. Co. Tues, Wed, Fri, 7-8 pm. Pacific.

KFCF, Walla Walla, Wash. 360 meters. Frank A. Moore.

KFCG, Billings, Mont. 360 meters. 500 m. Electric Service Station, Inc. Wed, Fri, Sun, 7:30-9 pm, music. Mountain.

KFCI, Colorado Springs, Colo. 258 meters. 50 m. Colorado Springs Radio Co. Club, "Lion Tamers." Daily ex Sun, 12-1 pm, 5:15-6:15, music. Special concerts, 10-11 pm. Sun, 11-12:15 pm, 7:30-9:30, church. Mountain.

KFCL, Los Angeles, Calif. 360 meters. 1,500 m. Los Angeles Union Stock Yards. Daily ex Sun, 10-10:30 am, 1:15-1:45 pm, 4-4:30, 8-8:20, live stock reports. Thurs, 9-9:20 pm. Pacific.

KFCM, Richmond, Calif. 244 meters. 500 m. Richmond Radio Shop. Slogan, "Out Where the West Ends." Daily ex Sun, 1-2 pm, music. Tues, Fri, 3-9 pm, music. Pacific.

KFCP, Ogden, Utah. 360 meters. Ralph W. Flyers.

KFCQ, Houston, Tex. 360 meters. 1000 m. Fred Mahaffey, Jr. Daily ex Sun, 7:30-8 pm, markets, entertainment. Sun, 2-3 pm, entertainment. Central.

KFCY, Union College, W. Va. 252 meters. 300 m. Western Union College. Wed, Fri, 8-9 pm, music, educational. Central.

KFCZ, Omaha, Neb. 258 meters. Omaha Central H. S. Mon, Wed, Thurs, 3-4 pm; 7:30-8:30. Central.

KFDA, Baker, Ore. 360 meters. 25 m. Adler's Music Store. Daily ex Sun, 5-6 pm, 7-8, music. Sun, 6-8 pm. Pacific.

KFDD, Boise, Idaho. 252 meters. St. Michael's Cathedral. Sun, 11:15-12:30 pm, 8-9:15 church activities. Mountain.

KFDM, Tucson, Ariz. 360 meters. 200 m. Univ. of Ariz. Temporarily discontinued. Mountain.

KFDO, Corvallis, Ore. 360 meters. Oregon Agri. College.

KFDY, Bozeman, Mont. 248 meters. 200 m. H. Everett Cutting. Mon, Wed, Sat, 8-9 pm. Mountain.

KFDZ, Des Moines, Iowa. 278 meters. 300 m. Hawkeye Radio & Supply Co. Daily ex Sun, 3-3:45 pm, reports, music. Mon, 9-10 pm, music. Thurs, 9-10 pm, 11-12:30 am, music, entertainment. Central.

KFDR, York, Neb. 360 meters. 50 m. Bullock's Slogan, "The Little Station with the Big Kick." Club, "Radio Bats." Daily, 4-4:30 pm, children's hour; Wed, 8:30-10 pm, music. Sun, special afternoon program. Central.

KFFP, Moberly, Mo. 275 meters. 300 m. First Baptist Church. Slogan, "The Gospel Messenger of the Air." Sun, 10:45 am, 8 pm, church services. Central.

KFFQ, Colorado Springs, Colo. 360 meters. 250 m. The Marksheet Motor Co. Daily, 8:15 am, weather; 4-5 pm, concert. Mon, Wed, Fri, 8-9:30 pm, special program. Mountain.

KFFR, Sparks, Nev. 226 meters. 50 m. Jim Kirk. Fri, 7-8 pm, "Sagebrush Canaries." Pacific.

KFFV, Lamoni, Iowa. 360 meters. 600 m. Grace-Land College. Wed, 9:20 am, music appreciation. Thurs, 8 pm, entertainment. Central.

KFFX, Omaha, Nebr. 278 meters. 600 m. The McGraw Co. Daily, 2:30-3:50 pm. Central.

KFFY, Alexandria, La. 360 meters. Pincus & Murphy, Inc.

KFFZ, Dallas, Tex. 360 meters. Al. G. Barnes Amusement Co.

KFGC, Baton Rouge, La. 254 meters. Louisiana State University. No regular schedule.

KFGD, Chickasha, Okla. 248 meters. 50 m. Chickasha Radio & Elec. Co. Slogan, "Queen of the Washita." Daily ex Sun, 12-12:45 pm, 8-8:45, music. Central.

KFGH, Stanford Univ., Calif. 222 and 280 meters. 500 m. Leland Stanford Junior University. No regular schedule.

KFGL, St. Louis, Mo. 266 meters. 800 m. National Guard Missouri.

KFGL, Arlington, Ore. 234 meters. Arlington Garage.

KFGP, Cheney, Kans. 229 meters. Cheney Radio Co.

KFGQ, Boone, Ia. 226 meters. Cray Hardware Co.

KFGV, Utica, Nebr. 224 meters. 50 m. Heidebreder Radio Supply Co. No regular schedule.

KFGX, Orange, Tex. 250 meters. First Presbyterian Church. Sun, 11 am, 7:30 pm, church services. Central.

KFGZ, Berrien Springs, Mich. 268 meters. Emanuel Missiourary College.

KFHA, Gunnison, Colo. 252 meters. Colorado State Normal School. "Where the Sun Shines Every Day." Daily ex Sun, 8:30 am, weather, markets. Tues, 7:30 pm, entertainment. Mountain.

KFHB, Hood River, Ore. 280 meters. 50 m. Rialto Theatre. Daily ex Mon, 6:20-6:35 pm, sports, news. Sun, 1-1:45 pm, music. Special programs 11 pm. Pacific.

KFHD, St. Joseph, Mo. 226 meters. 100 m. Utz Electric Co. Daily ex Sun, 5:30-6 pm. Mon, Thurs, Sat, 8-9:30 pm, concert. Central.

KFHF, Shreveport, La. 266 meters. Central Christian Church.

KFHH, Neah Bay, Wash. 233 meters. Ambrose A. McCue.

KFHI, Wichita, Kans. 221 meters. Charles V. Dixon. Mon, Thurs, every third Sun, 8:15 pm. Central.

KFHJ, Santa Barbara, Calif. 360 meters. Fallon & Co. Wed, Thurs, Fri, Sat, 6-6:45 pm; Wed, Fri, 9-9:10 pm; Sun, 10 am, church services. Pacific.

KFHG, Los Gatos, Calif. 242 meters. Curtis Bros. Hardware Store.

KFHR, Seattle, Wash. 270 meters. Star Elec. & Radio Co.

KFHS, Ilihu, Hawaii. 271 meters. Clifford J. Dow.

KFHU, Mayville, N. D. 265 meters. M. G. Sateren.

KFHX, Hutchinson, Kans. 229 meters. Robert Nelson.

Radio

Illustrated

A strange pair of Radiophans! At least they say the turtle enjoys ether music as much as its mistress, Miss Henriette Sloane of New York City. But, then, people say so much—and even call this fair lady a "DX hound," for she reports new long distance records almost daily to Radio editors. One of that crusty fraternity considered her a "pest" until he sent a photographer to investigate and found what you see below. We think it likely the editor revised his opinion as well as his vocabulary after this ocular evidence; don't you? — K. & H. Photo



Two sets that aroused interest at the recent Radio show in New York. At the left is pretty Agnes Leonard with the largest receiver ever built, and above, a German set captured in the late war by our boys in the memorable battle of Chateau-Thierry
 Left: Photo by United Above: Fotogram Photo