

Story of WSB, "Voice of the South"; How Mica Fixed Condensers Are Made; Frank Oliver, WGY, Interviews Himself; Next to Final Gold Cup Standing

# Radio Digest

EVERY WEEK **Illustrated** PROGRAMS **TEN CENTS**

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

Vol. X Copyright 1924 By Radio Digest Publishing Co. SATURDAY, SEPTEMBER 13, 1924 No. 10

## TWO NEW "FALL SUITS"

### HOT SPRINGS OPENS NEW STATION SOON

LOCATED ON TOP OF HOTEL ARLINGTON; 500-WATT

Will Set Precedent Among Hotel Circles in South; Special Studio on Top Floor

HOT SPRINGS, ARK.—Millions of people will hear about Hot Springs National Park, Arkansas, for the first time this winter when the powerful new Arlington broadcasting station takes the air.

W. E. Chester, vice-president and general-manager of the hotel company operating the Eastman and erecting the three million dollar Arlington, has signed a contract with Western Electric representatives for the installation of one of the best and most powerful broadcasting stations in the country, which will broadcast the New Year's grand opening of the Arlington, as their initial program.

The Arlington will set a precedent in hotel circles in the south in being the only hotel in this section equipped with a broadcasting station of this capacity, which will be of the same size as that being operated by the Edgewater Beach hotel, Chicago, which can be distinctly heard in all parts of the United States, Canada, Mexico and Cuba.

A special studio is being erected on the top floor of the new hotel and the conduits for the remote control wires are in.



Above is shown Fern Bachman, talented violinist, who has appeared on numerous occasions at Station KPO. She is very popular with the Radio audience.



Gertrude O'Neil Ganley, humorous impersonator known to Radiophans as Tillie, of "Tillie at the Photographers," the laughing girl skit.

### WILL TRY TO PUT LIMIT ON SET OUTPUT?

Or So It Would Seem According to Indiscreet Statement by David Sarnoff

#### Armstrong Patent Again

Westinghouse Attempts to "Harass and Heckle" Chicago Radio Laboratory and Clapp-Eastham

CHICAGO.—Just as fall comes and Radio business industriously begins to increase profitably, just as Radio manufacturers begin to announce their new model receivers, the Westinghouse Electric & Manufacturing company, files suit against the Chicago Radio Laboratory here, manufacturers of "Zenith" receivers, and the Clapp-Eastman company of Boston, both Armstrong licensees, for alleged violation of their licenses. The two suits, filed at the time they are, according to well-informed authorities on E. F. McDonald, Jr. the subject, are fully indicative of the policy of the gigantic E. Pittsburgh corporation to "harass and heckle" competitors legally licensed to make Armstrong regenerative sets.



The object of the two suits is shown by the bill of complaint filed against the Chicago Radio Laboratory in the U. S. District court for the northern district of Illinois. The complaint requests "that the license agreement be adjudged cancelled, annulled and void."

The "Price of Not Harassing" "The price of the Radio Corporation, and also the Westinghouse company, for not harassing us," said E. F. McDonald, Jr., of the Chicago Radio Laboratory, when interviewed about the suit, "is contained in the very indiscreet statement of one David Sarnoff, famed for his position as vice-president of the Radio Corporation of America.

"Mr. Sarnoff, known chiefly for his lectures on the subject of Radio before chambers of commerce and similar bodies, not so long ago ventured to make us a peace pact. It will make interesting reading for those of your readers who still believe that Radio monopolies exist for altruistic motives.

"Mr. Sarnoff offered," continued Mr. McDonald, "to grant the Chicago Radio Laboratory a new and binding Armstrong (Continued on page 2)

# NEXT WEEK SHOWS GOLD CUP'S OWNER

## HAY, WLS, MAINTAINS LEAD DURING CLOSE CONTEST

### Hired Hand Donates 92-Pound Watermelon to Office Force as Gift from Fort Worth

There's a steady counting, counting. The scene takes place in the office of the Radio Digest and the Gold Cup Award Editor with several assistants is busily tabulating the votes of the contest. The total for the fifteenth ballot has been finished showing George Hay, WLS, still holding the lead. Next week the world's most popular Radio announcer will be divulged!

Ballots have been received from practically every country in the world, and announcers have been nominated from all the stations in this country, Europe, Cuba, Porto Rico, Mexico and Canada. Everything considered, it has been some contest!

Regarding "dark horses," there have been plenty and it still remains to be seen whether or not one of these so-called dusky perchersons will lift the Cup. Talk about optimism, many of the stations are getting pedestals ready to receive the 14-carat Gold Cup.

#### Receive Texas "Marble"

A mysterious bundle was received the other day by express from Fort Worth, Texas. When opened it turned out to be a ninety-two pound watermelon from the Hired Hand. It isn't known whether it was supposed to be a bribe or not. If it was, the bribe was accepted, but the only thing that could be done for the donor of said watermelon was to give him the undying thanks of the office force.

A letter followed close upon the "seeds" of watermelon, apologizing for its size. "Ordinarily," the letter said, "in this country we don't use such runts for table purposes. The kids use them for marbles, but in view of the circumstances you will have to be satisfied." Thanks! we are more than satisfied. Call again.

#### Who's Who at Fifteenth Ballot

Following are the standings of the contestants at the close of the fifteenth ballot. The list contains the names of announcers receiving fifty or more votes, any one of them a possible winner:

Name	Station	Votes
George Hay	WLS	28,993
Bill Hay	KFKX	23,643
J. M. Witten	WOS	11,339
Leo Fitzpatrick	WDAF	10,796
The Hired Hand	WEAP	8,873
John Daggett	KHJ	8,627
Graham McNamee	WEAF	7,220
Fred Smith	WLW	6,357
H. W. Arlin	KDKA	5,288
Richard Haller	KGW	5,243
Lambdin Kay	WSB	4,441
Kolin Hager	WGY	4,342
Jack Nelson	WGN	3,627
Gene Rouse	WOAW	3,493
Sen Kaney	WGN	3,256
E. W. Tyson	WWJ	2,875
S. W. Barnett	WOC	2,324
Miss V. A. L. Jones	KSD	2,281
Elmer Johnson	WJAX	2,183
Paul Johnson	WLAG	2,072
H. E. Ehrhart	WDAR	1,814
Major J. J. Fanning	WNAC	1,672
F. W. Johnson	CHYC	1,645
A. R. Herske	WTAM	1,509
N. T. Granlund	WHN	1,242
Roxy Rothafel	WEAF	1,234
Howard Millholland	KGO	1,136
Otto Becker	WGR	1,122
C. R. Emery	WGI	1,052
Jennings Pierce	KGO	1,002
Major Andrew White	WJZ	979
Johnnie Mack	WJAS	851
John T. Griffin	WHAH	650
Joseph Sartory	WCAE	607
Walter Wilson	KYW	606
J. T. Schilling	WHE	602
Milton Cross	WJZ	598
N. D. Cole	WHO	567
Henry Field	KFNF	566
A. O. Coggeshall	WGY	552
Claire Morrison	KPO	507
C. A. Entreklin	WCAH	502
Harold Sallier	WHAH	467
R. P. Falcon	PWX	454
John Reilly	WJAR	412
Paul A. Greene	WSAI	406
Chas. Erbstein	WTAS	402
F. A. Buhlert	KFJC	392
Paul Reese	KFI	381
A. F. Edes	WEZ	347
W. A. Fay	WGY	313
Victor Martin	WHAM	312
C. W. Kirby	WWJ	301
William F. Holliday	WWJ	300
Carl E. Hammond	KFOA	294
Morgan Eastman	KYW	260
Karl Stefan	WJAC	259
J. K. Bohanan	WTAR	257
Jerry Sullivan	WQJ	256
Eleanor Poehler	WLAG	227
Chas. H. Meester	WCER	203
J. Lewis Reed	WJZ	167
Robert Weidaw	WGY	163
C. D. Tomy	WCX	152
William Ludgate	KSD	146
C. A. Gaal	KUO	145
Leigh C. Parker, Jr.	KFFY	138
Gilson V. Willetts	WOC	126
Art Burroughs	2 LO	112

## WHEN WNYC FIRST WENT ON AIR



Mayor John F. Hylan, left, congratulates Grover Whalen, retiring commissioner of plants and structures, to whose initiative and efforts the new station is due, upon the opening of WNYC, municipal broadcaster. Thomas H. Cowan is broadcasting supervisor and R. Bruce Lum, announcer, at WNYC. Photo © U. & U.

Don MacPhee	WAAW	112	Install New Time Signal System
E. J. Bowers	CFCA	102	
Eddie Smith	WGY	94	KANSAS CITY, MO.—WMB, Kansas City, has installed a new signal system which is to tick off the seconds for three minutes preceding noon. The signal is to come from the Postal Telegraph company, Kansas City. The apparatus is to be used for accurate time setting.
Carl Mentzer	WHAA	74	
Joseph Nassau	WOO	62	
Eddie Squires	KDKH	60	
John F. Patt	WDAF	56	
Steve Trumbull	KYW	52	
Robt. Whitney	WMAQ	50	

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## Looking Ahead

The Radio Party, Radio Dance and Other BCL Novelties will be revealed to you next week by Paul Edelman in the concluding chapter of his "30-Minute A-B-C Lessons for Beginners." To get the full advantage of your receiver, you should know about the uses to which it can be put.

WMC, "Down in Dixie" and WLS, Unlimited, will be featured soon in the new picture section of Radio Digest. You like to know who's who behind the scenes, don't you? One of these picture pages shows just how the "WLS Unlimited" is engineered.

Lessons in the Practical Use of Receivers, Homemade or Bought, will be the subject of a series of thirteen articles by Thomas W. Benson, of which the first, "What to Expect from Your Radio Set," will appear next issue. These articles are all non-technical, and should prove a help to everyone.

Making Radio Cabinets and Consoles isn't difficult if you know how to begin. Charles F. Smisor will tell you how, beginning next week. Simple lessons in cabinet making will be appreciated by the man who enjoys the pungent odor of fresh sawn wood.

H. J. Marx Has Put a Simple Three-Tube Set on a 7 by 10 Panel in a way that will interest, no doubt, many exponents of compact receivers. Watch for the description next issue. Later he will start a short series of articles on the construction of a new development in super-heterodyne receivers.

Radio Frequency Amplification for the Amplidyne is another tidbit awaiting the readers of next week's issue. Read about the Amplidyne described on page 25 this week.

### Newsstands Don't Always Have One Left

WHEN YOU WANT

# Radio Digest

YOU WANT IT!

BE SURE OF YOUR WEEKLY COPY BY SUBSCRIBING NOW

SEND IN THE BLANK TODAY

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

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

Name .....

Address .....

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

## TWO NEW "FALL SUITS"

(Continued from page 1)

license, if we would pay a sliding scale of between 15 and 18 per cent and submit to a limitation of output.

#### Would Not Listen to Limitation

"The Chicago Radio Laboratory refused to consider any proposition that would limit their output. You see the result. The octopus withholds its attack until the heavy sales season opens, and begins to harass and heckle."

As a conclusion to his statement, Mr. MacDonald brought down his fist on the table. "It's the principle of the thing that we will fight. We refuse to surrender to such practices."

In regard to the license to manufacture Armstrong circuit receiving sets, held by the two companies just sued, it is interesting to note that both were issued by Armstrong some time before the Westinghouse company ever considered the purchase even of the patent.

The Chicago Radio Laboratory license was issued on May 15, 1920. Not until November 15, 1920, did E. H. Armstrong assign his title to the much litigated patent No. 1,113,149 over to the Westinghouse company, and then the assignment was not recorded in the U. S. patent office until February 13, 1923.

#### Westinghouse Lost Similar Suit

In reviewing the records of litigations it is found that in a practically parallel case of recent date the Westinghouse company sought to cancel the Armstrong license held by the Tri-City Radio Electric company, Davenport, Ia., but were defeated in their attempt.

Federal Judge Martin J. Wade, of that district, dismissed the plea, and sustaining the evidence of the defendants, assessed the Westinghouse company with all costs of the suit. The defeat of the large corporation, significant as it was, did not receive much publicity, however, probably due to its technical nature.

#### Unlicensed "Infringers" Untouched

In the number of "harass and heckle" suits so far initiated by the Westinghouse company, it is an interesting fact that no suits have been brought against firms not holding Armstrong licenses, but nevertheless manufacturing Radio receivers which do regenerate, thus infringing the Armstrong patent. This observation is significant because:

1. If such a firm were sued, the unlicensed manufacturer might have the available evidence at hand to prove that the Armstrong patent is illegal and therefore invalid, a proof that the Westinghouse company naturally seeks to avert for its own good.

2. Armstrong licensees, having accepted a license to manufacture under the patent, in so doing have accepted its validity and therefore cannot question its validity in court. In other words the licensees cannot take recourse to prove that the patent is illegal and invalid.

Because of this, the unlicensed Radio manufacturer, by tricks in designs of their sets, can make so-called infringing sets and still be in the enviable position of not having troublesome litigation as an impediment to their production, and profits.

#### Did Westinghouse Buy Empty Bag?

Early this year the Armstrong patent was brought into the limelight when the U. S. patent commissioner was overruled by the District of Columbia court of appeals, and priority for the oscillating audion, claimed by Armstrong, was presented to Dr. Lee De Forest. The oscillating audion, according to many authorities, is basic so far as regeneration is concerned.

Thus it becomes a matter for conjecture whether or not the Westinghouse company paid \$500,000 to E. H. Armstrong for something he thought he had, but didn't.

An unsigned statement, originating with the Westinghouse company but not marked as coming from them, was released shortly after the De Forest award of priority. This statement purported that the rights of the Westinghouse company were still intact and that Armstrong licensees should continue to pay royalties as usual.

However, Victor Beam, attorney for the company, after the De Forest victory did not, and evidently would not, write a letter or give a signed statement to licensees demanding royalties. The latter is believed to be an admission by the Westinghouse company that the Armstrong patent is, to all intents and purposes, null and void.

A suit of the company against an unlicensed manufacturer would undoubtedly establish the validity, or perhaps invalidity of the regenerative patent. None, however, has been filed as yet by the Westinghouse company.

## Club and Party Gatherings Dance to Music from WBAV

COLUMBUS, OHIO.—Radio dance music is extremely popular in Central Ohio. This is shown by the numerous telephone calls and letters received by Station WBAV since Charley Mobley's dance orchestra has been furnishing the music for that station's Tuesday evening programs. Numerous clubs and party gatherings use Radio music exclusively.

## TAKE UNAUTHORIZED MOVIES OF STATION

### FRENCH LIEUTENANT GIVES CINEMA MEN CHANCE

Prevail Upon Him to Take Them Into Station; Will Be Disciplined by Authorities

PARIS.—The Eiffel Tower Radio station is all underground. Recently a motion picture of the Station was made, more or less by accident.

Motion pictures of Eiffel Tower Radio station have not, to the knowledge of present day authorities, ever been taken before, nor have they ever under any circumstances been authorized. The manner of taking the present pictures was amusing, as it was quite unauthorized.

A young aviation lieutenant became quite friendly with some cinematographic operators who had been working with him taking pictures of the le Bourget flying field. Being a kind hearted chap, he was easily prevailed upon to help them get into the underground passages of the Tower, to which access is only gained by a written permission of the Commandant, or accompanied by a soldier.

#### Pass Officer in Uniform

The lieutenant being in uniform, none of the sentries cared to stop him, and he calmly took his group of camera men into the sacred precincts of the great Station, where they were taking a set of pictures quite at their leisure when stopped by one of the Tower officials.

He also took them up to the third platform (the very top) which is allowed only to military officials and civilians who have surrendered any photograph apparatus to the guardian below.

The War Ministry admits, however, that this can hardly be attributed to espionage work, as the entire Eiffel Tower station has been photographed and photographs and descriptions published in every country in the world.

The volunteer "guide" will be subjected to certain disciplinary measures, merely to remind him to keep in his own particular line of army work.

## GERMANS DOUBT BUT BUILD THREE PLANTS

### Think Telegraph Wire Linking Will Create Distortion

Washington, D. C.—The German Telegraphic administration does not favor the method used in the United States of picking up Radio programs from another station by a selective long range set and re-broadcasting them. A report received here states that the administration has just placed an order for three five-kilowatt\* broadcasting stations. The first station is now being built in Nuremburg, Bavaria.

The programs of the Munich station will be transferred by special wire to Nuremburg, a distance of 120 miles, and will be put on the air with an antenna output of one kilowatt. German experts are expressing doubt even as to the practicability of this scheme, believing that transmission over 120 miles of telegraph line will result unquestionably in distortion.

\* (Editor's Note.—German tube ratings are considerably higher than their actual output, contrary to the American method of rating.)

## WGY BROADCASTS A THUNDERSTORM

### No Doubt Many Fans Thought That Orchestra Was Taking Liberties with Score

SCHENECTADY, N. Y.—WGY, General Electric company broadcasting station here, recently broadcast the music of a thunderstorm for the benefit of those living on sun-parched farms. The storm occurred during the broadcasting of a concert by the Schenectady Little Symphony orchestra from Central Park, Schenectady.

The musicians had just started "The Calm" section of Rossini's overture from William Tell when unexpected and unwelcome reinforcements joined the orchestra. Contrary to the prediction offered by "It Ain't Goin' to Rain No More," it was a real storm with an accompaniment of hail. To the listener it might have appeared that the orchestra was taking liberties with the score but the apparent improvisations were introduced by elements.

The sound of thunder, wind and rain was picked up by the microphone and broadcast with the tranquil music of the overture. What is more, the thunder didn't quit when the conductor, Leo Kliven, lowered his baton at the end of the number.

## NAME BABY BOY FOR RADIOCAST STATION

TROY.—The baby boy which was named for WHAZ at this city very promptly after his birth last September, William Henry Arthur Zion, is now developing into a lusty youngster. Neighbors in Schuylerville, N. Y., report that he is Radiocasting nightly with the windows open during the heated spell this summer and that his cry sounds very much like "Whaz, Whaz, W-H-A-Z."

## POLITICAL SPEAKER NEEDS BE POLITE

BOSTON.—Political candidates who use the Radio to broadcast their speeches in this state must be polite. Rules issued by a broadcasting station in this city recently—the first of the kind promulgated in Massachusetts—say that "a man may talk about what he stands for, what his party stands for, etc., but he may not revile or attack his political opponent or any other party."

## LIGHT ON A VERY DARK SUBJECT



Radio sets have been built in practically every known piece of furniture. This is the latest. Placing it in a lamp and using the base as a loud speaker. Photo shows Miss B. Blumenthal in her home in New York using this novel combination. K. & H. Photo

## BEAM STATION TO BE ERECTED SOON

Will Link Great Britain with Dominions; Operate on 100-Meter Wave

MELBOURNE, AUSTRALIA.—Premier S. M. Bruce, speaking in the House of Representatives here recently on the second reading of the bill dealing with the agreement between the Commonwealth and the Marconi company in connection with the Radio station that is to link up with Great Britain and the Dominions, said that instead of a high power station being erected, as at first intended, a beam station would be built in Australia at a cost of £120,000. The beam station, he said, would operate a wave length of 100 meters.

Premier Bruce added that he hoped the rates for the transmission of messages by the beam system would be half those chargeable under the high-power system.

## Orchestra From Ship Gives Public Treat

S. S. George Washington Ensemble Composed of Expert Musicians

NEWARK, N. J.—Broadcast listeners recently had the pleasure of listening to a concert by the orchestra of the S. S. George Washington of the United States Lines which appeared at Station WOR.

The ensemble of expert musicians is noted among ocean travelers for excellent dance music and its rendition of classical and semi-classical programs.

The S. S. George Washington is one of the favorite steamships of operatic stars. Many of the world's leading artists who have traveled on it have appeared at the ship's concerts and have been accompanied by members of the orchestra to their complete satisfaction. A varied program was selected for the concert and music lovers who tuned in to WOR were rewarded with delightful musical entertainment.

## RADIO WORLD'S FAIR LARGEST IN HISTORY

### EUROPEAN AND AMERICAN BANKERS INTERESTED

Duly Impressed with Commercial Possibilities of New Science; Put Radio on Financial Basis

NEW YORK.—The First Radio World's Fair to be held under the direction of Messrs. U. J. Herrmann and James F. Kerr in Madison Square Garden and the 69th Regimental Armory, New York City, Sept. 22nd to 28th, inclusive, is rapidly assuming an international importance which promises to make it an epochal event in the history of Radio.

The coming fair will not only be the largest and most complete show of its kind ever staged, but it will probably be the direct cause of quickly establishing the Radio business on a financial basis similar to that now enjoyed by the automobile industry.

#### Capitalists Interested

Over a dozen important European and American financiers will begin extensive surveys of the Radio field at the First Radio World's Fair, and if they are duly impressed with the commercial possibilities of the new science, which seems a certainty, scores of able inventors and manufacturers who are now handicapped by a lack of capital, will soon find themselves in a position to expand beyond their fondest hopes.

In a recent interview one of Wall Street's best known bankers said: "Now that Radio has reached the World's Fair stage, I am of the opinion that it will soon cease to be looked upon as a passing fad."

"I am firmly convinced that Radio will, in the very near future, furnish cheaper light, heat and power as well as be the means of instantaneous transcontinental and trans-oceanic communication at a cost even lower than our present rate of postage."

#### Putting Garden in Shape

"The leading capitalists here and abroad are already about half convinced that Radio really is a thing of tremendous commercial value, and I think the coming International Exposition at Madison Square Garden will be an excellent closing argument for them. I fully expect to see several of our biggest railroads, steamship, electric, coal and oil magnates take an active interest in the development of Radio in all its branches during the coming year."

For the past two months a small army of scenic artists, carpenters and electricians have been at work on the booths and decorations for the big show. General Manager Kerr, who is an exposition impressario of many years experience, always insured against minute delays through constructional mistakes by contracting for the delivery of all equipment two weeks before the opening date.

## Get Low Powers in Buenos Aires

Saint Assize, France, Using Ten Kilowatts, Heard by Receivers at Villa Elisa, Argentina

BUENOS AIRES.—The lower power beam ray has been successfully used recently for over two weeks for night transmission of regular commercial Radio messages between France and Argentina, according to an announcement issued here.

The station at Saint Assize, France, using only ten kilowatts power and a wave length of 85 to 90 meters, sent messages, which were received at Villa Elisa, Argentina, by means of a small receiving set in the offices of the Trans-Radio Internacional's high-power station.

Still more remarkable, it is stated, is that the station also received regular night traffic from POZ, Nauen, Germany, sent out by a three-kilowatt station which did not use the beam ray.

#### May Revolutionize Radio

The experiments are described as having demonstrated that low power transmitters, which are unable during the daytime to send messages such long distances as between Europe and Argentina, work perfectly at night and that high-power stations still are necessary for the day traffic.

Engineers, however, consider the success thus far achieved with low-power transmission may revolutionize Radio, and that after further experiments it may be possible to do away with high-power stations.

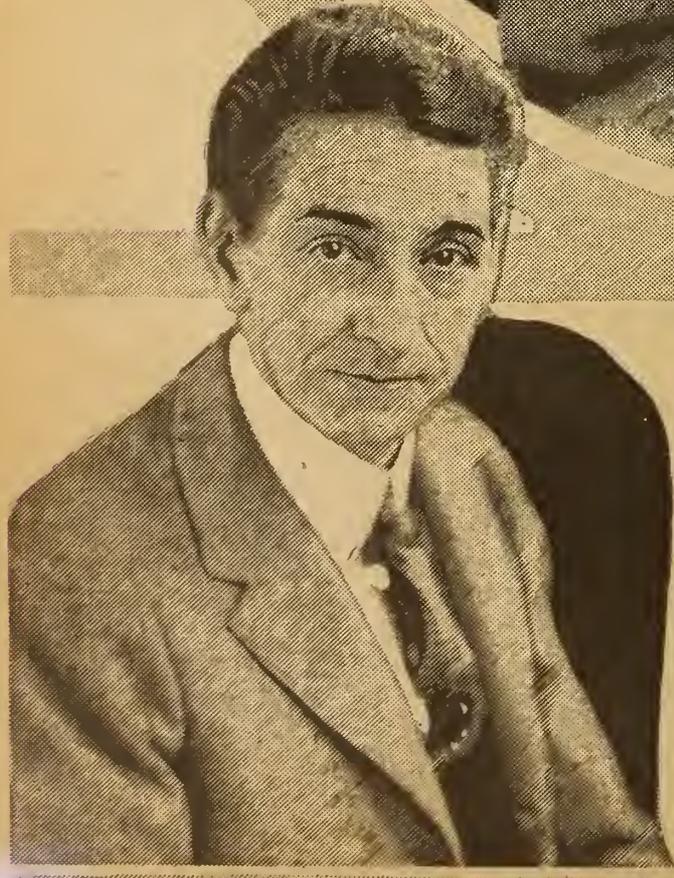
It is understood that engineers of American, British, French and German Radio companies met recently in Paris to consider the effect of this new development, and that it was decided that each company should conduct experiments and make reports.

# Frank Oliver, WGY Character Man, Tells How



## From Melodrama to Radario

Self Interview by Frank Oliver



"OLIVER, write us your experience as a character impersonator before the 'mike.'" (This from the chief.) Now, had he said, "Tell it to the stenog," it might have been possible for me to get somewhere near a story. Then again, the flood of verbosity once let loose, might have resulted in a whole mountain of manuscript.

Seeing as how I have to write, I'm going to make it snappy.

In the first place going back over a stage career of forty years—No! I'm not ancient history—the profession called me at the "top and marble" age of nine and has been calling me

ever since. Newsboys, urchins, sometimes a lordly kid, would be the line of parts that suited me best. At the age of fourteen or so, character actors were my special admiration. Then I'd hang around the dressing room when make up was being applied.

With what naive interest I'd watch the thin man made fat! From that time on, it was character impersonating for me. But—and here's the rub—being young and passably fair, juveniles fell to my lot. Romantic, love-sick youths never appealed to me, and after mutilating "Little Billy" in "Tribby;" "Charles" in "Our Boys," etc., a (Continued on page 8)

# The Atlanta Journal—"Voice of the South"



You have just heard "Tot" Kay announce the next number. Stand by for but a second and the charming misses will entertain you.

## WSB, One of the First

By Bonnie Barnhardt

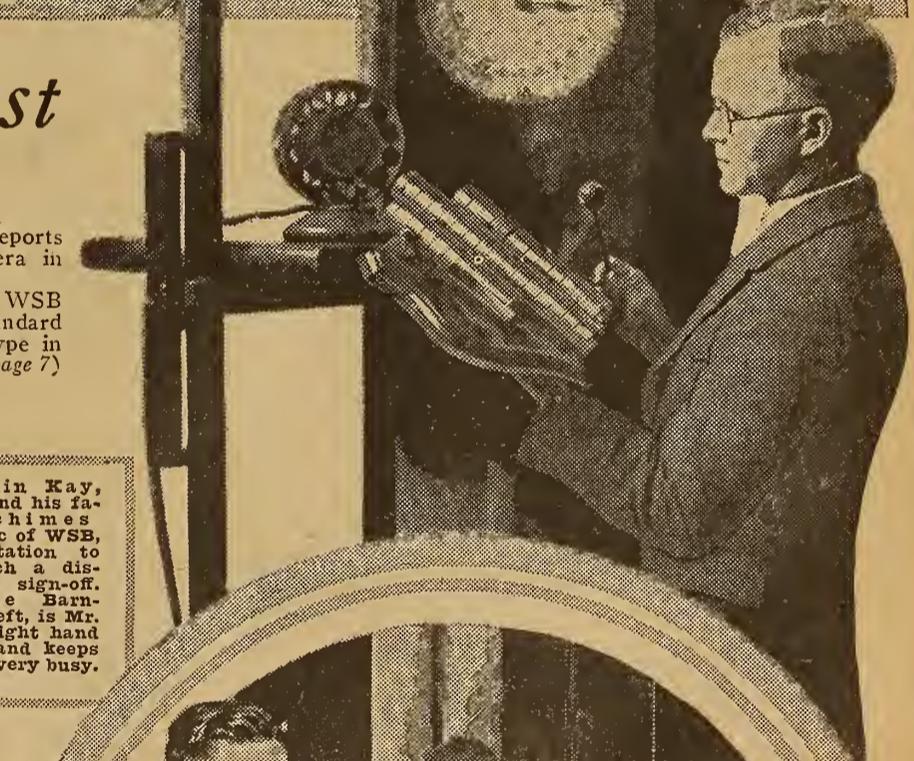
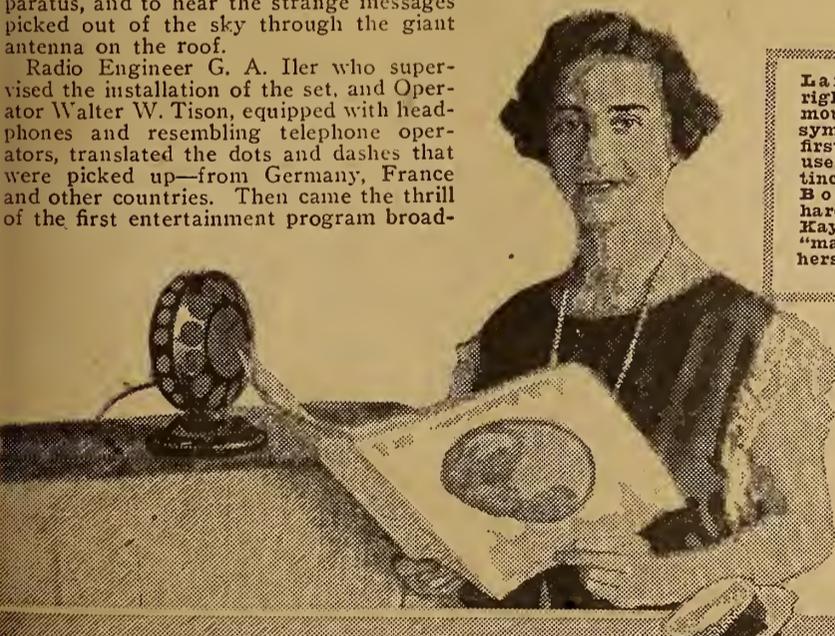
WSB was born on March 16, 1922. On that day The Atlanta Journal carried a front page story announcing that the South's first big broadcasting station had been installed on the top floor of The Journal building. Thousands of curious visitors flocked to the fifth floor to view and marvel at the mysterious apparatus, and to hear the strange messages picked out of the sky through the giant antenna on the roof.

Radio Engineer G. A. Her who supervised the installation of the set, and Operator Walter W. Tison, equipped with headphones and resembling telephone operators, translated the dots and dashes that were picked up—from Germany, France and other countries. Then came the thrill of the first entertainment program broad-

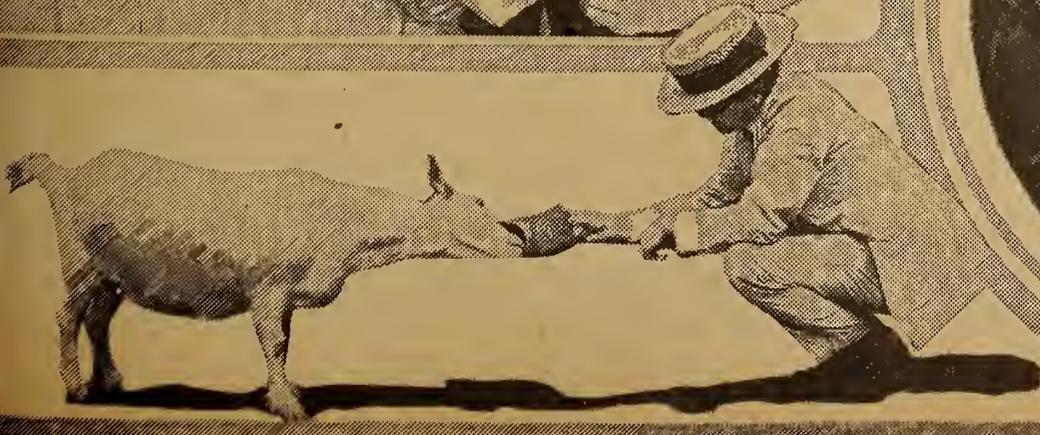
cast—and the weather and market reports and news. So began the Radio era in Dixie.

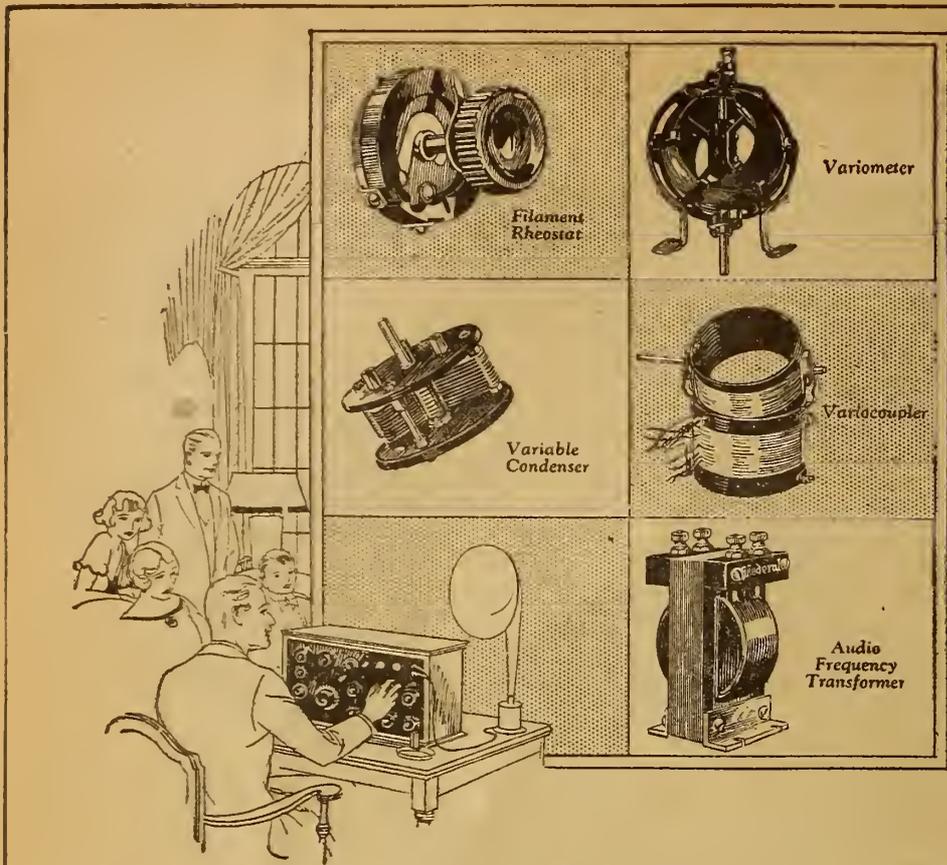
After three months of operation, WSB was christened on June 13 as a standard 500-watt outfit, the second of its type in the world, and one (Continued on page 7)

Lambdin Kay, right, and his famous chimes symbolic of WSB, first station to use such a distinctive sign-off. Bonnie Barnhardt, left, is Mr. Kay's right hand "man" and keeps herself very busy.



"Ti" Tison (circle) is chief operator and "static eradicator" for WSB. He claims he is kept away a head of himself jumping from place to place picking up relays. Lower left is Kay with some-body's goat.





FROM smallest screw or binding post to condensers, vario couplers and transformers, each of the 130 Federal Standard Radio Parts are made to give maximum service and are backed by the iron-clad Federal performance guarantee.

Federal Telephone Mfg. Corp.  
Buffalo, N. Y.

For a quarter century Federal has specialized in tone qualities. Today the rare beauty of Federal Tone and also the simplicity of Federal operation are spoken of as ideals in the field of radio.

Federal sets may now be purchased on easy payments. Ask your dealer.

Look for this sign



When assembling your set, insist that each part be of Federal manufacture

# Federal

## Standard RADIO Products

Boston New York Philadelphia Pittsburgh Chicago San Francisco Bridgeburg, Canada

# IT'S HERE

So far ahead of the conventional type of Super Heterodyne circuits it is like holding a candle against the sun.

- Coast to coast reception using ground only.
- Only two dials and stations can be logged.
- Easily constructed by anyone.
- Seven tubes with only 7 inch by 28 inch panel.
- Static and distortion reduced to an absolute minimum.
- Covers a wave range of 90 to 575 meters.
- Exceptionally selective yet easily tuned.
- The limit of amplification reached with present day tubes.

The Super Hilco Dyne Kit for building the Super Hilco Dyne Receiver is accompanied by complete wiring diagrams and a descriptive booklet that is the most thorough treatise, on any circuit, of any booklet published.

The price of the kit is only \$30. With a few other standard parts which every dealer carries, you can build a complete Super Hilco Dyne Receiver for approximately \$75, that will make your brother fans leave their own sets and come to you for a good "listen in."

Do you want to dance, no matter where the music is? Do you want to hear a lecture, no matter where the speaker is? Do you want to hear a song, no matter where the singer is? Then go to your dealer, purchase a Super Hilco Dyne Kit and build a Super Hilco Dyne Receiver that gets what you want when you want it.

They are built to out-perform—not just to sell.

# The SUPER HILCO DYNE KIT

A Wonderful Kit at a Price Within the Reach of All



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Manufacturers of Scientific Radio Apparatus that is distinctively Different and Superior in Efficiency and Appearance

# FROLIC AT MEMPHIS TO OPEN SEASON

## HOLD REDEDICATION FOR 'HUSHPUCKINNY'

WMC TO LAUNCH MYTHICAL BOAT SEPTEMBER 12

"Down in Dixie" Station Returns to Regular Winter Schedule with Special Midnight Frolic

By Katherine Nelson

MEMPHIS.—The Hushpuckinny is coming back. That mythical ship that sailed an etheric sea for listeners of WMC, "Memphis Down in Dixie," is to be launched again. The Hushpuckinny has been on the ways for several months being refitted and refurnished to suit the tastes of the crew and passengers. The old deep-toned whistle has been overhauled and its solemn notes will be heard again within the week.



G. L. DEARING

Here in Memphis Skipper Jerry Dearing and the crew of the old river boat are preparing for a launching when the Hushpuckinny will slide down the ways into the water. Ceremonies befitting a ship of the greatest class are being prepared. Music, speakers, champagne and all the festivities that attend the launching of great ships will be provided.

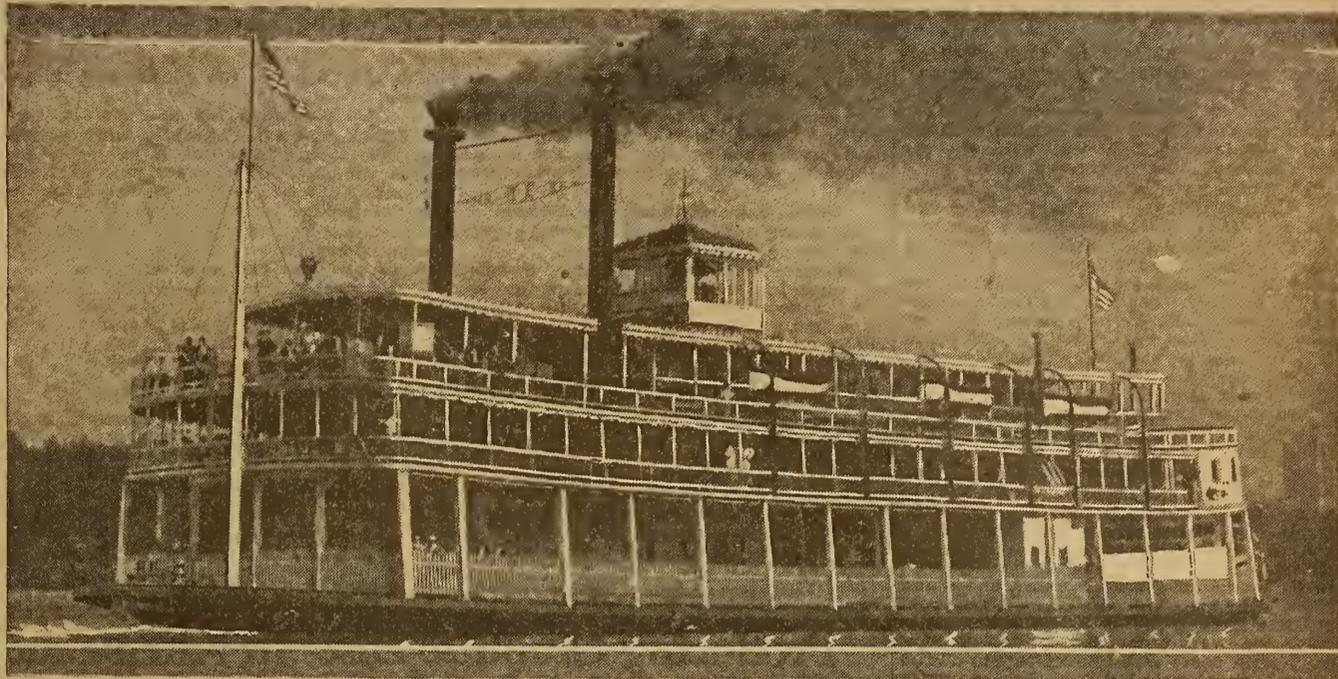
Launching Set for September 12

The Hushpuckinny is the child of the brain of George D. Hay, present announcer of WLS, Chicago. The steamboat whistle was brought to the station by L. D. Semmes, first announcer of WMC. Mr. Hay added the name and constructed the mythical ship. Bob Miller and his Steamer Idlewild orchestra played on the program that introduced the whistle and on the one that saw the birth of the ship. They will provide the music on the night of the second launching.

The Hushpuckinny will be launched on the night of September 12, at 11:30 o'clock, Central time, in the middle portion of a Midnight Frolic by Bob Miller and his boys. Mr. Miller is preparing his jazziest program for that evening in anticipation of an extraordinary Radio audience.

To Break Bottle of "Champagne"

Announcer Dearing will be master of



Phantom Ship "Hushpuckinny," to be launched again and sail the etheric sea from WMC, Commercial Appeal, "Down in Dixie."

ceremonies. The skipper will give the signal for the launching and will stand by to give the first blast of the whistle when the boat reaches the water. The Very Rev. Israel Noe, dean of St. Mary's cathedral, will make the launching address.

The breaking of the non-existent bottle of champagne across the phantom bow will be left to some Memphis beauty as yet undecided. Every part of the launching will be audible and will be broadcast so that all may witness the event.

The launching of the Hushpuckinny will mark the opening of the winter season for WMC and its staff. A series of the good old Southern concerts that made the station famous will be put on the air this winter.

## PRIZE FOR BEGINNERS' DESCRIPTION OF RADIO

Judges of Contest Will Be Prominent French Scientists

PARIS.—A commendable effort to interest beginners in radio is being made in France, where a contest has been opened offering prizes to anyone who can set forth in the most simple and non-technical language the principals of Radio telephony, both for transmission and reception.

The prizes will be in cash, the Lakhovsky foundation having already subscribed 1,000 francs, and M. Chiron, editor of "L'Onde Electrique," 500 francs. The text of the explanation must not be more than 15,000 words, and must remain absolutely anonymous. Second and third prizes will also be offered.

Among the judges are MM. Bellini, Belin, Corret, Beauvais, Levy and Veaux.

## People on Excursion Steamers Use Radio

Dance to Music from Station WWJ Aboard Ship

DETROIT.—Thousands of people on the excursion boats along the Detroit river, and other steamers on the great lakes, especially those on Lake Erie, Lake St. Clair and Lake Huron, are doing much of their dancing this summer from music broadcast from Station WWJ, the Detroit News. More than 1,800 persons were made happy at one time recently on the Steamer Tashmoo all the way from Port Huron and Tashmoo park to the pier in Detroit by dance music furnished from this station.

Dancing to music that is being played many miles away, and especially when the dancing is out in a great lake, has an inspiration all its own.

Station WWJ has made a specialty of orchestra and band music this summer. Besides the boats on the lakes and rivers depending on it largely for entertainment, it also is being received at most of the municipal parks in different parts of the city.

The orchestra and band furnishing this music are made up of real artists, many of their selections being heard on phonograph records. Individual band playing in the Detroit parks has almost entirely ceased with the exception of the Scherman band at Belle Isle, which is broadcast twice daily to the other parks and to the boats out in the lakes and rivers. The programs are arranged to suite the tastes of everyone, consisting of both popular and classical selections.

## Concerts with Microphone Open Please Radiophans

COLUMBUS, OHIO.—Open "mike" concerts are found to be extremely popular with listeners who hear WBAV regularly. For several weeks, each Friday night, when the Dispatch program is presented through WBAV, the microphone has been left open from the beginning of the concert to the end. The listeners hear the program director giving instructions to the artists; hear the applause of those in the studio; hear impromptu remarks by the entertainers to those about them. Hundreds of listeners have written in, asking that this plan be continued, as it enables them to imagine that they are right in the studio instead of at their sets at home.

## Large Number of Notables Join Franco-American Club

PARIS.—Reginald Gouraud, the American Radio ace of Paris, reports that he is making splendid progress with his Anglo-Franco-American Radio Club, which he started to organize only about a month ago. Ambassador Herrick, the ambassador in Paris, has accepted the office of honorary president. Also, although he has not officially accepted as yet, the Prince of Wales planning to join.

## ANNOUNCER BACK AT KANSAS CITY AGAIN

"MERRY OLD CHIEF" COMES TO FRONT ONCE MORE

Away for Three Months on Combination Chatauqua and Honeymoon; Will Start Frolic Again

KANSAS CITY, MO.—Leo Fitzpatrick, the "Merry Old Chief" of the Kansas City Star Nighthawks, who for three months has been on tour with a Chatauqua, has returned to WDAF.

A five hour celebration was given recently in his honor. Many of WDAF's favorites, including The Plantation Players, Hotel Muehlebach, Charles Dornberger's Victor Record orchestra, playing on the Kansas City Athletic club roof garden, Eddie Kuhn's Kansas City club orchestra, McMillan's Ivanhoe temple orchestra, and the Star's own orchestra had a part in the program. In addition, L. FITZPATRICK the "Chief," otherwise R. A. Dio, sang several popular numbers assisted by the WDAF minstrels.

Frolic on Every Night

Beginning September first, the Nighthawk frolics resumed nightly instead of every other night as had been the schedule during the summer months. Charters will again be granted at the rate of hundreds a night, and the professor will "strut his stuff" as of old. After having a chance to "catch up" on sleep the Nighthawk flock should be now ready to stick to the head phones for the two hours each night, during the winter.

"Had a wonderful time," said Mr. Fitzpatrick of his trip, "but I'm surely glad to be back."

"I never realized what a large membership the organization had until I visited some of those small towns on the circuit. Most everyone claimed to be a member of the Nighthawks."

Mrs. Leo Fitzpatrick accompanied her husband on the trip which was also a honeymoon, but was taken sick with typhoid fever and was forced to remain in a hospital for over a month. She is recovering rapidly however.

The Hungarian government is planning to allow receiving sets to be used in that country, if they be sealed. This will mean doubtless, another trial for the idea originally adopted by Australia, but which proved unsuccessful there and was abandoned.



L. FITZPATRICK

## The Atlanta Journal, "Voice of the South," Boasts Interesting History

(Continued from page 5)

of the half-dozen pioneer giants of the country. A specially treated echo-proof studio was added to the other equipment. With padded walls, draped windows and thick rugs it was declared to be acoustically perfect for broadcasting purposes.

Thus was Atlanta and the South established as a pivotal center of Radio progress. WSB is now in its third year of service, and the Radio miracle has become as much of an institution in daily life as the telephone, the phonograph, the piano, and the street car.

Personalities Behind "Voice of the South"

For something over a year, WSB transmitted on the wave of 360 meters for entertainment and 485 meters for weather, markets, etc. In the fall of 1922, WSB was fully accredited as a Class B station, and given the wave of 400 meters, which later at the National Radio Conference in Washington was changed to 429, the present wave.

The Radio staff at WSB whose personalities have made The Journal station what it is, are: Lambdin Kay, chief announcer and director of the station; Miss Bonnie Barnhardt, staff artist and associate director; Walter W. Tison, chief operator; C. F. "Harry" Daugherty, associate operator; and Rufus B. Duncan, Jr., third assistant. Two other nationally famous personalities who have been important factors in popularizing WSB, are Ernest Rogers, Journal reporter-poet-troubadour, and Fiddlin' John Carson, Dixie's champion oldtime fiddler.

"Tot" Kay Has Many Brain Children

Lambdin Kay, better known to his friends as "Tot" Kay, has already had his past history and misdeeds pretty well uncovered to the Radio world at large. The famous slogan, "The Voice of the South," is a child of his brain; likewise, the idea of the three-note plumes used as an identification signal.

Too, the policy of the station of trying to gauge the wishes of the great cosmopolitan Radio audience and giving them as near as possible what they want, of feeling the pulse of the unseen listeners and of steering clear of anything savoring of the stereotyped and one-track policy, is the creed of Mr. Kay. That, more than any other one thing, has been the means of keeping WSB at the head of the list with the other national stations.

Creed of WSB's Director

The Journal's director believes that when a man, woman or child is enough interested to listen in, he or she is entitled to hear everything said, and everything transmitted. So, insofar as he is able, he makes this possible, first by his vocal delivery, second, by his direction of the placing of the various units giving the program, and third by his general supervision of everything that goes from WSB's studio to the ears of those listening.

Besides announcing the night programs and directing affairs in general at the Station, Mr. Kay also essays the job of editor of the Radio page in the daily and Sunday Journal; shakes hands with scores of visitors every day; makes speeches at all sorts of luncheons and dinners; articulates (Continued on page 10)

## Operator Hanged for Murder

LONDON.—At the coroner's inquest over the body of the famous murderer Vaquier, recently hanged in England under such dramatic and tragic circumstances, the Superintendent of Police found that it was "Pierre Vaquier, 41 years, Radio operator."

Another international tongue, "parlamento" has been suggested to the League of Nations. The new tongue is said to compare favorably with Esperanto.

# FRANK OLIVER, WGY CHARACTER MAN, TELLS HOW

(Continued from page 4)

discerning manager decided that character and comedy parts were the extent of my ability.

Then came "Eccles" in "Caste;" "Matthias" in the "Bells;" "Peter" in "Romeo;" "Sir Toby" in "Twelfth Night;" the "Curate" in "Private Secretary" and so on down the line to bald headed cowboys and bewhiskered hebrews, with an eye glass Johnny or two thrown in.

"What was the greatest help in putting the characters over?" That's rather difficult to answer. Make-up and the part itself, the fellow actors, the stage setting. Then getting under the hide of the character himself and keeping their until the end of the act. Relaxing for the intermission, unless a change of make-up denoting advance of time was called for, in which case the allotted fifteen minutes was spent juggling spirit gum, whiskers and cornstarch and acquiring the gait and voice of the older man for the rest of the play, or unless a death scene was called for in the middle of the play.

### The Dead Comes to Life

Did you say go home? No sir, not in those early repertoire days. A villain would have to be arrested in the last act and the wily author had fixed it so the old man who died in act two could hurriedly shake off the dead man's shoes and don the bouges and moustache, yes, and broad brimmed hat of the snappy sleuth.

By the way, some years ago, in company with some well-known people of the present time, we played a short summer engagement in Canada. Farce comedies and dramas, small halls, small stages, kerosene lamps and candles, with a "too and from curtain strung on wires manipulated by members of the company from each side.

### When the Curtain Pullers Failed

This particular night, in a crowded hall, the villain started to pursue the kerosene, the leading man was Sulky and I, the father, had taken poison. Seeing no one at the curtain I prolonged my dying spasm to an unseemingly length in the hopes that the curtain puller would hurry. Hearing a footfall I hurried the death. But, to my consternation I heard no curtain. No one in the audience laughed but there was an ominous silence. I could "Dead" it no longer, so rising, walked to the front and bowed like the old time tragedians.

By that time the curtain pullers were back on the job. But I can tell you, I died no more until I saw that the recalcitrants were on the job. It is just such an experience as this that throws the young actor on his own resources, calling forth any latent powers of improvisation.

### Motion Pictures in Early Days

Pictures? Oh yes, in the early days. But somehow I couldn't make a success of it. At that time work was too intermittent and I usually had a steady position as director or actor that paid me more money, though many with whom I was associated have become wealthy and famous.

Acting in movies is undoubtedly trying work. It means so much waiting around for scenes, that in projection take only a few minutes. But even in pictures one is aided by the settings and the general surroundings and nowadays they even have music suitable to the moods of the players to get results.

The Radio? Oh! Now we're getting to it. Well, I'll tell you candidly. Playing character parts before that chilly looking piece of metal, "mike" they call him now, is no cinch.

Stage and the pictures have the costumes, the makeup, the settings, the former even has the actual presence of the audience—all incentives to one's work. But no one can ever convince me that there's any incentive to make. He's the coldest looking proposition any performer could encounter.

### Great Invisible Is Hard Task Master

Oh, yes, they disguise him with a shade and elaborate fringe—but when that little old red light goes on—you just know Mike is right there, saying, "Come on, feed it to me, Kid, and make it snappy."

Sometimes you do and sometimes you don't. If the chin keeps still and the knees don't give way, and the desire to cough is choked, out on the air you go—for good or bad. The great invisible can now hear you breathing, the rustle of the paper and Oh, Yes, the least little mistakes which of course means that a letter must be sent to the director informing him of the sad lapse.

How do we create the enthusiasm? The WGY Players are a pretty happy bunch, know each others little failings, know how to overcome them, get into the spirit of the play at rehearsals. Keep up that spirit during the performance, discuss the character, picture to ourselves the types—then tell 'em to friend Mike.

### The Forgotten Black Whisky Bottle

Efforts? I'd almost forgotten that part of the broadcasting. Why, I don't know, considering I've played "dog's howls," "cat's meow," "canary bird," to say nothing of the door crash, airplane, locomotive and steamboat whistles and storms.

I think the clink of glasses and china rings over well. Speaking of glasses reminds me of a property that used to be

called for in nearly every show, I mean the blank whisky bottle. No play ever seemed complete without it. Somehow the property man could never keep a bottle or two for just stage purposes but would use them carrying kerosene or some other delicate liquid. Now, I ask you could a villain retain his composure or a character actor refrain from expletives when, drinking to the success of their diabolical schemes, they each get a good mouthful of cold tea flavored with kerosene?

### When Radario Cues Are Missed

No, that's not happened to WGY players yet! We've been pretty careful.

Strange incidents? Nothing to speak of. Once in a while a character would lose the manuscript and as prompting must be done with sign language, it may look funny to the outsider to see the director trying to explain excitedly with his finger "to go on" or "look over someone else's part." It's funny to us—when the act is over. On two or three occasions an auxiliary artist has decided the play was over as far as he was concerned and disappears. It's kind of disconcerting to suddenly find the character missing when he should be ready to pick up the cue.

What is done? Oh, one of the more ex-

perienced actors will use a different voice and fill the gap. It will work most of the time. But not if the missing actor has a voice well known to Radiophans. For I can tell you, you can't fool them very much. Assumed names amount to nothing. They get used to the accent and intonations.

### So He Hunts for New Noises

Yes, I do think character work is just as fascinating to me as it ever was and with the two years' experience of Radio drama, I don't think it will lose its power of holding me to the play world.

Radarios are here to stay and character impersonations will always prove a successful part of any entertainment.

No, sir! That's all—you'll catch me writing my biography. Good-bye. Yes, this is my vacation time. Sure! I'm looking up new noises to feed Mike with.

### Radio Show in Milwaukee

MILWAUKEE.—The Wisconsin Radio exposition will be held in this city from November 11 to 14. Many of the large manufacturers and dealers will have their products on display. A large attendance is expected and preparations are being made to take care of the crowds.

## Noted Librarian Talks On Good Books; Fans Pleased

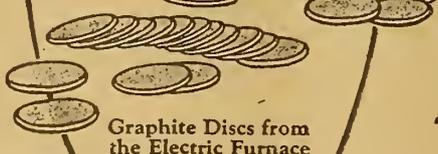
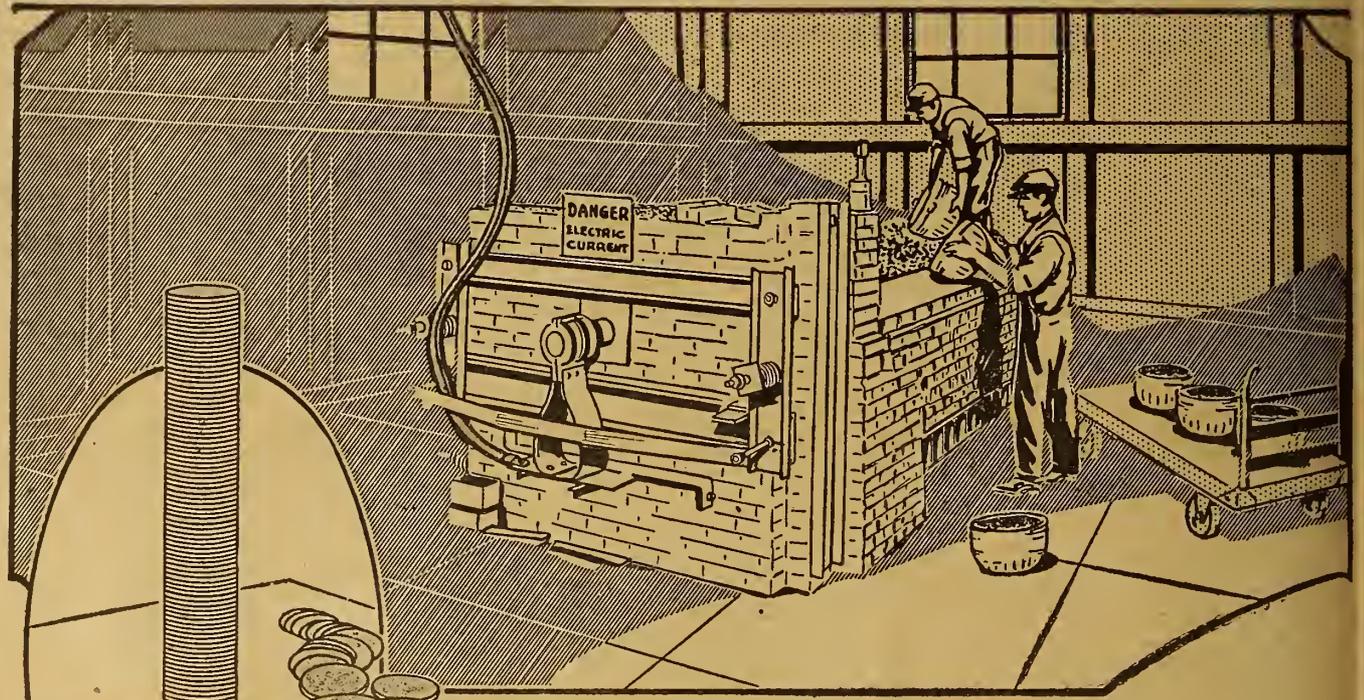
NEWARK, N. J.—Asa Don Dickinson, librarian of the University of Pennsylvania who has been associated with practically all the great libraries of this generation, is a prolific writer and the author of a score of books of more than usual interest. His appearance at WOR, recently, to speak on a subject as profoundly attractive as the one he chose, "Good Books," certainly proved a treat. This is the first in a series, "Men of Achievement," which WOR will present to the Radio audience from time to time. Each week at least, one man or woman of unusual note will be featured.

## Entire Program of Noted Musical Comedy Broadcast

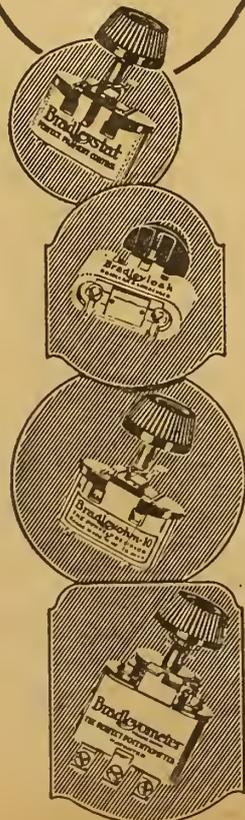
SCHENECTADY, N. Y.—The entire performance of "The Dream Girl," was recently broadcast by WGY, General Electric station here, from the stage of the Ambassador theater, New York.

The musical comedy of Messrs. J. J. and Lee Shubert was put on the air in place of the program originally scheduled by WGY for that evening. The Schenectady station was able to offer the entire performance as a result of the co-operation of Station WHAZ of Troy, N. Y., which gave up its period to WGY.

## Producing Graphite Discs in Allen-Bradley Electric Furnaces



Graphite Discs from the Electric Furnace



## Allen-Bradley Radio Products are the best insurance against trouble

FINE, stepless control is not the only distinctive feature of Allen-Bradley graphite disc radio devices. It is true that with no other type of rheostat can you enjoy the noiseless, stepless, selective control of the Bradleystat. No adjustable grid leak can equal the Bradleyleak.

But there also is the inherent reliability of the graphite discs, produced in the terrific heat of the electric furnace, and encased in porcelain containers that cannot warp. Atmospheric changes mean nothing to graphite discs. Corrosion cannot destroy them. Continuous use cannot impair their perfect operation.

The slight extra cost of Allen-Bradley radio products is an insignificant premium on insurance against interrupted radio reception. Think this over! The quality endures after the price is forgotten.

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## PLANS BEING MADE FOR DEFENSE TEST

### EXTENSIVE PREPARATIONS UNDER WAY IN CAPITOL

Many Stations Being Linked by Telephone Wires to Facilitate Movement of Various Troops

WASHINGTON. — Extensive preparations are being made for the "National Defense Test" to be made throughout the country on September 12. Radio will play a big part in these preparations, and Radiophans are requested to listen in for the patriotic demonstration.

The entire program will be Radiocast from Washington and relayed over telephone wires to various points throughout the United States. Stations not linked up with these wires will broadcast a special program on their own account.

Major General Charles McKinley Saltzman, chief signal officer of the U. S. Army, will be in charge of the broadcasting for the government during the entire program. To "Provide for Common Defense"

There is no doubt that the great majority of those who oppose defense day, no matter how mistaken they may be, are honest and sincere in their opinion. The national defense act of 1920 is based upon the constitutional requirement to "provide for the common defense," and upon the bitter lessons learned in the World war.

A call to residents of Nassau county, New York, to participate in defense day exercises at Mitchell field, L. I., will be broadcast from a speeding DeHaviland plane by Major William N. Hensley, Jr., commandant of the flying field, between the hours of 6:30 and 7 o'clock Eastern time, September 11.

ATLANTA. — Public understanding and recognition of the "National Defense Test," to be staged by the United States army in conjunction with leading patriotic bodies of America on September 12, is being furthered in the south by a series of splendid programs broadcast by WSB under the auspices of the fourth corps army area.

The date of the demonstration marks the retirement of General John J. Pershing and is in the nature of a nation's tribute to the great war-time chieftain as well as a survey and inventory of the country's armed strength.

Through the initiative of Major General David C. Shanks, commander of Uncle Sam's armed forces in the southeast, the programs have been arranged at WSB. The series will come to a climax when WSB's transmitter will record and broadcast the entire program conducted on national defense day at Piedmont Park. This will be an afternoon affair with leading organizations of Atlanta participating and a mammoth crowd present. On the night of September 12 WSB will participate in the simultaneous broadcasting of the addresses by General John J. Pershing, President Coolidge and General McCarty.

### Special Program for Every Nation on Air

#### Station KGO Entertains Everyone Simultaneously

OAKLAND, CALIF.—The power of Radio to entertain the nations of the earth simultaneously was shown recently from General Electric Station KGO here. At one o'clock in the morning a vast audience of listeners in Australia, New Zealand, Tasmania, Chile, Peru, Ecuador, the Philippine Islands, China, Fiji Islands and various islands of Polynesia were given a special treat.

Governors of the states of California, Washington, Oregon, Nevada, Arizona, Idaho and Utah participated in the program.

Only the late dance music part of the KGO broadcast schedule is heard consistently in the South Seas owing to the great difference in time, and thousands of requests have been received for an early morning broadcast. This special program, broadcast from both the San Francisco and Oakland studios of KGO at 1 a. m. on Saturday morning, was heard in New Zealand about 8:30, Saturday evening.

### Powerful British Station Heard With Crystal Set

LONDON.—5XX, the big station at Chelmsford, England, has been heard in Algiers on a crystal set with almost perfect clarity. In Paris it is not considered unusual to listen to this station at any time with a galena detector. At the moment Chelmsford is being heard in Paris with much greater success than Eiffel Tower. The farmers in the neighborhood of the city complain that they cannot make out the meteorological predictions of FL any more because the latter is transmitting so badly; but that they enjoy listening to the British station.



Major General Charles Saltzman, chief signal officer of the U. S. Army, who will be in charge of the broadcasting for Defense Day. P. & A. Photo

## CLEVELAND SHOW IS LARGER THIS YEAR

### PROMINENT NEWSPAPER IS CONDUCTING EXHIBIT

Dealers and Manufacturers Throughout Country Will Be Represented; Contest for Homemade Sets

CLEVELAND.—Profiting by the experience of previous years, the Cleveland Radio Dealers' association will this year hold their annual Radio show in the Cleveland Public Auditorium in order to provide the requisite amount of space for exhibitors and visitors. The show will open on Saturday, September 20 and continue through the succeeding week until Saturday, September 27.

The show is being conducted under patronage of the Cleveland News-Leader, an evening paper that has always been prominent in its support of the Radiophan by timely articles and constructional details for benefit of those who "build their own." The News-Leader is providing prizes approximating a total value of \$1,000 for home built sets of three classes; crystal, tube, and original, or "freak" sets. Judging from past experience, the display of these sets will alone be well worth the small admission fee that will be charged.

The Radio dealers in Cleveland are sparing no expense to provide exhibits that will be not alone of interest but of educational value. The largest dealers and manufacturers in the country will be repre-

sented by exhibits of the largest offerings of sets and parts and as this is to be a "Radio winter" in the biggest sense of the phrase, there is no question that there will be any lack of attention.

The three stations now operating in Cleveland will be shortly increased to five, unless well-laid plans go glimmering, and all that will be required to have music of and desired kind is to have a set that embodies a reasonable amount of selectivity.

## NEW STATION TO OPEN WITH NEW FEATURES

### Ask for Class "A" License to Avoid Interference

CHICAGO.—Foster & McDonnell, Chicago community newspaper publishers, have contracted for the erection of a standard 500-watt Radiocast station. The set will be ready for use sometime this winter.

Application will be made to the government to secure a class A license so as to use a wave length less than 300 meters and avoid the interference incident to the use of a higher wave length, the latter field being overcrowded in Chicago at present.

Plans are being made for continuous operation all day and evening with a variety of features designed to interest every type of listener in.

The new station at Straschnitz, near Prague (Czecho-Slovakia) will replace the transmission station of Kbely, working on 500 meters. The apparatus is of American manufacture.

## Belden

Enameled Aerial Wire

Loop and Litz Wire

Round Hook-Up Wire

Square Hook-Up Wire

Shielded Hook-Up Wire

Insulated Hook-Up Wire



## Belden

Magnet Wire of all kinds

Radio Rosin-Core Solder

Radio A & B Battery Cords

Assorted Tips and Terminals

Bakelite Tube Sockets

Beldentube & Spaghetti

# Solving a Difficult Problem for the Radio Experimenter

The successful set builder is just as careful about the small details as he is of the big ones. Proper terminals, hook-up wire, tubing and solder are just as important as the condensers and couplers. The efficiency of many radio sets is destroyed by careless workmanship or poor materials; for a few cents more, a poor set could have been a good one.



Belden Insulated Hook-up Wire showing distinctive Belden carton

During the past few years the Belden Manufacturing Company has continually added new items to its growing list of radio products to meet the insistent demands of radio manufacturers for dependable materials used in assembling their standard sets.

Last year a number of these items were made available to discriminating radio fans who sought the best in radio. This year the Belden line of radio products will be prominently displayed by leading radio dealers in distinctive cartons that will be a guarantee of quality in radio material.

Every radio fan can now enjoy the satisfaction that comes from the knowledge that his set is made of high quality material, throughout. If you build a loop or outdoor aerial, assemble a set, or improve your present hook-up, build Belden Quality into every part.



Buy your terminals from this Belden assortment. The quality is incomparable

## WATCH FOR THE NEW BELDEN LINE OF RADIO PRODUCTS

**Belden Manufacturing Company**

Electrical Wire, Cable and Cordage

General Office and Factory  
2300 S. Western Ave. CHICAGO, ILLINOIS

Magnet Wire Department  
4627 W. Van Buren St.

Sold Through Dealers OnlyOrder Through Your Dealer

### TELL ARTIST EDITOR OF YOUR FAVORITES

**D**O YOU have a favorite Radiocast artist whose picture has not appeared in Radio Digest? If so tell the Artist Photo editor about it. Write him a little note mentioning the artist's name and station and he will attempt to give you what you want. The photographs, however, will be restricted to those artists for whom there are a number of requests. Space limitations demand the latter provision. Just write your note to the Artist Photo editor, care of Radio Digest, Chicago.

### WSB, "VOICE OF SOUTH"

(Continued from page 7)

ranges programs; plays golf; works twenty six hours a day; owns an automobile, and does not look like he sounds.

#### Introducing Bonnie Barnhardt

Miss Bonnie Barnhardt, came to join WSB's forces in July, 1922. Prior to that time her greatest interests in life were basketball, dancing and playing the piano for a jazz orchestra. Then one night she happened to accompany a friend to The Journal's studio and after a talk with Mr. Iler, who was an old friend, and Mr. Kay, she consented to "try-out" for the place of staff artist.

Miss Bonnie admits that she had always had a "hankering" to write, so after awhile she was told the five things that must go into a newspaper story "lead," and given instructions to turn out her first story. Since then, her "Underwood" is kept fairly busy aiding in giving recognition of entertainers who present WSB's concerts.

Miss Bonnie is called the "Lady O' the Radio," and one of her principal tasks is telling the daily bedtime story, running a column in The Sunday Journal, called "Bonnie's Bedtime Corner," and singing and playing for the myriads of kiddies (and grownups) who listen to WSB every afternoon. She also arranges programs, does a good deal of handshaking, sometimes pinch-hits as announcer; has bobbed hair, a cheerful disposition, and a sense of humor; likes to "make-up" the page, and drive an automobile; prefers chicken breasts and livers; and loves Ra-

dio and newspaper work above every other job on earth.

#### "Ti" Tison, "Static Eradicator"

Walter W. Tison, WSB's chief operator, and "Static Eradicator" has charge of the physical well-being of The Journal's operating apparatus, and is kept way ahead of himself, he says, jumping from place to place with his amplifying unit handling relays of various characters, from motorcycle races and Elk parades to jazz harmony by Warner's Seven Aces on the Capital City Club Roof Garden.

Mr. Tison is known throughout WSB's daylight range as "The Old Daylight Announcer," as he styles himself in announcing the midday and 5 o'clock programs. He hails from Cedartown, Ga., and saw service as Radio operator on board ship, from whence he came to WSB. "Ti" as his fellow laborers know him, is also the second party of WSB's first Radio romance. The other party, now Mrs. Tison, and formerly the "Virginia Girl with the Guitar," is still one of The Journal's most popular entertainers.

Associate operator C. F. "Harry" Daugherty alternates with Mr. Tison in handling the daylight schedules, and in doing duty in manipulation of the set at night. During the war Mr. Daugherty received a commission as ensign in the U. S. Navy. He also served as operator on board ship, and is a capable technical man. "Harry" is also the proud father of two charming youngsters.

#### "Willie the Weeper" and "Fiddlin' John"

Two of WSB's biggest assets are Earnest Rogers and Fiddlin' John Carson. Ernest Rogers is known from coast to coast for his "Willie the Weeper;" "Mythological Blues;" "My Red Haired Lady;" "Forgiveness," and many others of his homemade ditties, which he sings and plays to the accompaniment of his "brand-new, second hand, seven-year-old guitar." Ernest is primarily one of the Journal's star reporters, but he is without doubt one of the cleverest and most popular Radio stars in the United States.

Fiddlin' John Carson first became known when he was eight times declared Champion Fiddler of Dixie. This acquaintance was naturally limited to a comparatively small circle, but then Fiddlin' John heard of Radio and forthwith arranged to broadcast a program of his characteristic old-time backwoods tunes. He did—and today the Fannin county fiddlin' mountaineer is the most popular and famous fiddler in the country while his phonograph records sell like hot-cakes.



## The GREBE SYNCHROPHASE

(Trade Mark)



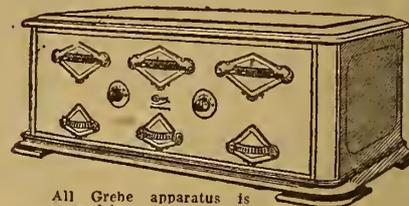
A BROADCAST Receiver that marks another long step forward in radio design and establishes a new set of standards in craftsmanship.

"It is only when the cold season comes that we know the pine and cypress to be evergreen."

—Confucius

In the coming cold season be not surpassed by thy neighbor—set the pace with your Grebe Synchronphase.

Doctor Mu



All Grebe apparatus is covered by patents granted and pending.

Ask your quality dealer for a demonstration of the Grebe Synchronphase or write us for literature.

### A. H. GREBE & CO., Inc.

Van Wyck Blvd.

Richmond Hill, N. Y.

Western Branch: 443 South San Pedro St., Los Angeles, Calif.

## MAGNATRONS

### Improved and Reduced

At one stroke we have both improved the MAGNATRON and reduced its price! The vacuum tube upon which discriminating radio users have come to depend is now even better than it ever was before—and yet it costs only \$4.

The new MAGNATRONS are tipless. That feature is important; it prevents breakage. Then there are internal changes which make MAGNATRON tubes unequalled for radio and audio frequency amplification.

The MAGNATRON DC-201A, the MAGNATRON DC-199, and the MAGNATRON DC-199 with the large base can be bought at your dealer.



CONNEWAY ELECTRIC LABORATORIES  
309 Fifth Ave., New York City

## without reservation

In minimizing energy losses lies the secret of a successful radio set. Our Low Loss Condenser comes close to eliminating loss entirely. That is why we offer it without reservation as a marvelous condenser.

Actual tests have proved that dielectric losses have been practically eliminated by this marvelous condenser.



Greater selectivity, more distance and a remarkable increase in volume naturally follow its use. A revelation!

## THE LOW LOSS GENERAL INSTRUMENT CORPORATION GROUNDED ROTOR CONDENSER

	Minimum	Maximum	
Type 46X 11 Plate	5 MMFD.	.00025 MFD.	.....\$4.50
Type 46A 13 Plate	6 MMFD.	.0003 MFD.	..... 4.50
Type 46D 21 Plate	9 MMFD.	.0005 MFD.	..... 5.00
Type 46F 43 Plate	15 MMFD.	.001 MFD.	..... 5.50

AT YOUR DEALER

Otherwise send purchase price direct to us and you will be supplied.

## GENERAL INSTRUMENT CORP.

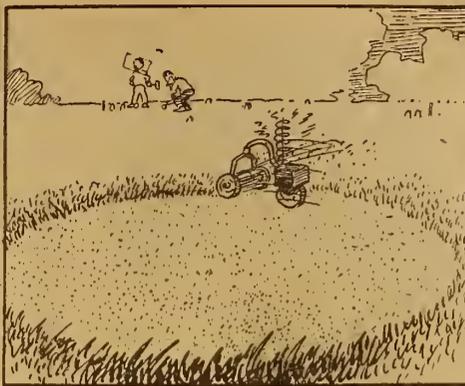
423 Broome Street  
NEW YORK CITY



THE ANTENNA BROTHERS

Spir L. and Lew P.

Sarah Returns



Hearing Mars Depends Most On the Drinks

By Jack G. Forrest

INSTRUCTIONS have been issued from Washington ordering the powerful Radio stations of the army and navy to stand by and listen for possible signals from Mars.—News Item.

Well, we have to give them something to do if we haven't got an extra war or so laying around.

Operators located at Camp Lewis reported that they heard extraordinary sounds beginning with a low note and ending with a "zipp."

They're right! Listen in on a Japanese tramp sending press news and you'll hear the same thing.

Telepathists in England sent metal signals to Mars some time ago.

Now they are sitting near a Radio set expecting to get their answer via Radio.

One scientist in Paris claims that he heard sounds that resembled people walking and horses running.

At last we have discovered the place where they haven't heard of Fords.

This joy will be short lived by the time the Radio men get through.

One broadcast station in Detroit has scheduled Henry Ford for a talk on "Building Automobiles." This will make quite a hit with the Martians.

About the first logical message to come through will read something like this: "Heard Station BLAH last night on my one tube sooper, and 'The Solemn Old Judge' the night before." Pls QSL OM, 73 CUL (Please acknowledge old man, best wishes, see you later.).

They will have to go some to beat the Radiophans we have on old mother earth. One bird the other night claims that he heard Saturn make a date with Jupiter. And they thought that fishermen were the only liars.

According to the latest dope, Mars is only 34,500,000 miles away—the nearest it has been to the earth in the last 120 years.

If the Martians have been tuning in on some of the big Radiocasting stations lately and getting the baseball scores, they will find that the Athletics are still hanging around the cellar.

Scientists state that the Martians are farther advanced in Radio science than the mortals on this earth.

If this is the case, I wish that they would tell what they are using in the place of tubes in their sets. In trying to reach them, I melted the plates of four tubes.

Another drawback to hearing Mars is the atmosphere. Engineers say that the clouds are heavily charged with electricity and so stop the signals.

Page Wendell Hall, he's the fellow who said that "It Ain't Gonna Rain No Mo'."

Radio men gathered in one of the cafe's in the Montmartre, Paris, were talking about the mysterious signals received at numerous stations.

By the time the party was over, they were hearing all kinds of signals—but they didn't come from Mars.

Dead Composer Resurrected By Radiocast Announcer

PARIS.—A Radio program in France a short time ago gave out one number, Romance en fa diez majeur (Shumann), by Mlle. Garaudet and the author." Since the author has been dead for more than half a century, those who knew anything of his history were considerably startled by the announcement.

Plays Exacting Role Tells of Reaction

Station WOR Broadcasts Madonna From "The Miracle"

NEWARK, N. J.—Elizabeth Schirmer, who plays the role of the Madonna in Morris Gest's production of "The Miracle," recently told the WOR audience her reaction after playing the most exacting feminine role in history.

She came to America last winter with her husband, Friedrich Schirmer, who re-arranged Humperdinck's original score of "The Miracle," and composed a whole new second act.

Mme. Schirmer came to rehearsals every day with her husband and had watched and studied the role. When Maria Carmi (Princess Matchabelli) left the cast last season, she stepped into her place altering with Lady Diana Manners, although she had never previously been on the stage.

She is now playing at every performance and will alternate with Lady Diana

Manners when she returns from abroad to resume her role, playing the role at performance in which Lady Diana plays the part of the Nun.

Umteenth Radio Divorce

CHICAGO.—Applying for a divorce, which was granted, Mrs. Elizabeth C. Norton said her husband beat her in a row over their Radio set.

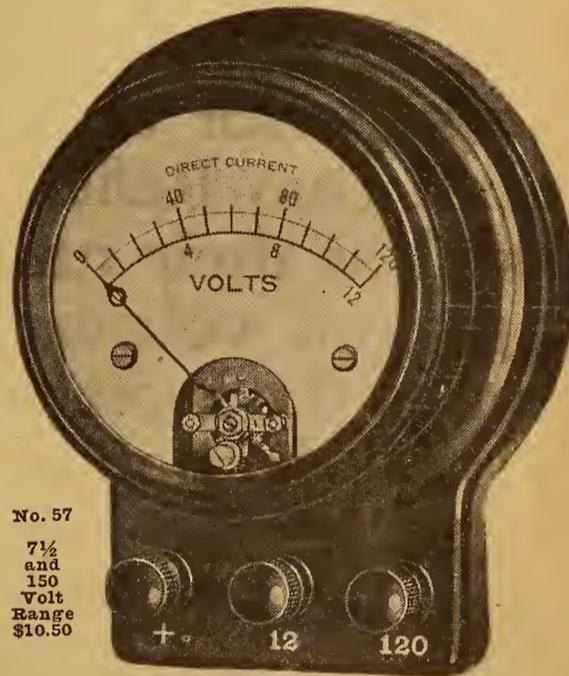
Don't lay your set out in such a manner that the grid and plate leads will run parallel to each other.



RUN-DOWN BATTERIES

Don't make the mistake of letting your batteries run down. A recent survey showed that over 60% of all radio trouble is traceable to run-down or weak batteries. You can never tell condition of battery until too late, unless you use a testing instrument of some kind.

Why guess—and continue to have so much radio grief?



No. 57 7 1/2 and 150 Volt Range \$10.50

SEMI-PORTABLE Double Range "A" and "B" Battery Voltmeter

The Jewell No. 57 "A" and "B" battery voltmeter was designed specially for radio battery testing. Many dealers are using it to test their stocks of batteries and set owners find it indispensable. It is finished in black enamel with insulated binding posts and a zero adjuster. A high grade all around semi-portable radio battery testing instrument.

- 0-7.5-150 volts ..... \$10.50
0-10-50 or 0-10-100 or 0-12-120 volts..... 10.00
0-40 amperes and 0-80 volts..... 12.50

BUY FROM YOUR RADIO DEALER



No. 84

(A very handy instrument for testing "B" batteries:—0-50 volts.) \$2.75

SEND US THE NAME OF YOUR DEALER IF HE DOESN'T CARRY JEWELL RADIO INSTRUMENTS



No. 85

(For making quick tests of Dry Cell "A" batteries—0-40 amperes.) \$2.00

Jewell Electrical Instrument Co. 1650 WALNUT STREET CHICAGO

"25 Years Making Good Instruments"

# WGR PIANIST EARNS LISTENER APPROVAL

## YOUNG WOMAN IS MAKING A BIG HIT WITH FANS

### Complimentary Letters Pour Into Studio Praising Her Playing; Signed Up for a Year

BUFFALO, N. Y.—Aside from those regulars like the Vincent Lopez Hotel Statler dance orchestra, it was discovered recently that Miss Eleanor M. Youtz wins the prize for being the top-notch entertainer appearing on special concert programs. Miss Youtz has appeared on fifteen consecutive concerts, one each month from the time that Station WGR moved into the Hotel Statler.

P. Arlow Matthews put on the Wheat's programs. He is a baritone of more than passing importance himself, but Miss Youtz, a piano soloist and accompanist, is considered the star of the Wheat's programs. "Lightness of touch," and "beauty of expression," is the way fans write in and characterize her work. Mr. Matthews takes this opportunity to announce that Miss Youtz is scheduled to feature the Wheat's concerts for the next twelve months, one each month.

In case some of her admirers don't know and want to know, Miss Youtz is not one-tenth as sad and pensive looking as she appears to be in her photograph. She is of medium height, slender and has fine coal-black hair that is a delight to the eye. She has a quick smile and friendly eyes, a delicate fine-carved nose and a mouth—well, you know how some girl's mouths are. Finger prints, not available.

When you hear Miss Youtz at the piano think of summer, wild flowers, rolling meadows, green hills and the like.

# CHARMING PIANIST'S ABILITY WINS FAVOR



Miss Eleanor M. Youtz has been heard in fifteen consecutive concerts from WGR, the Federal Telephone Manufacturing corporation station on the Hotel Statler, Buffalo. As a result of her charming interpretation of the classics and her ability as an accompanist, she has won the whole hearted favor of thousands of regular members of the WGR family.

# "the superior tone quality of Erla Duo-Reflex circuits, as well as their unmatched range and volume, stamp them as the most advanced types yet developed"



Erla reflex transformers alone amplify at maximum both received and reflexed radio frequency currents, without distortion. List \$5

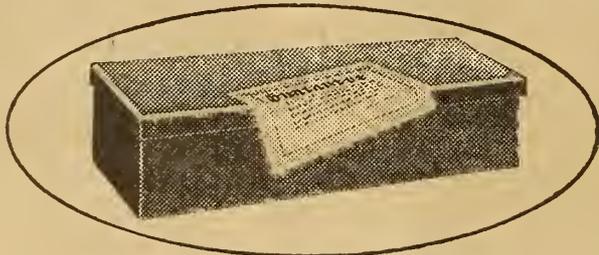


Unique ability to amplify three stages without trace of distortion proves conclusively the superiority of Erla audios. List price, \$5



The words "tested capacity" found exclusively on Erla fixed condensers, guarantee accuracy unapproached. Made in 11 sizes, 30c to 75c ea.

Dealers and Jobbers—High turnover of Erla dependable radio products conserves invested capital while yielding maximum rate of profit



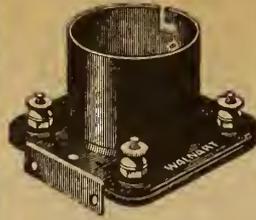
## Complete Factory Sealed Parts for Famous Erla Circuits

FACTORY sealed cartons of complete parts now make child's play of assembling Erla Duo-Reflex circuits, tube for tube, the most powerful ever built.

Synchronizing reflex and audio transformers, tested capacity condensers, balanced crystals, these and other factory packaged units remove all doubt as to selection of proper materials, while correct construction is made equally certain through a stenciled baseboard, drilled and lettered panel, and full-size blueprints giving the exact location of every nut, screw and wire. Soldering is eliminated by Erla solderless connectors.

Examine a completed Erla demonstrating receiver at your nearest dealer's. See how easy it is to build. Then make yourself a duplicate in a few hours' time. Your dealer will gladly co-operate. Or get in touch with us direct, giving your dealer's name.

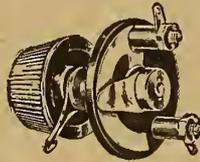
Electrical Research Laboratories  
Dept. A 2500 Cottage Grove Ave., Chicago



Walnut Sensible Sockets. Standard on leading sets. Lower dielectric loss, fiber or composition sockets. Guaranteed trouble, proof and unbreakable. Bakelite Dilecto Insulated, UV-199 or Standard base. List: 50c.



Walnut Variable Condensers. Plain Type. Plates accurately pressed, permanently aligned and locked in slotted studs fastened in Bakelite end plates. List: 3-pl., \$1.25; 5-pl., \$1.50; 13-pl., \$2.00; 17-pl., \$2.50; 23-pl., \$2.75; 43-pl. \$3.00.



Walnut Variable Grid Resistance. Variation of capacity from zero to six megohms by half turn of knob. Long lived. List: \$1.00; with fixed condenser, \$1.25.



Walnut "Tel Posts" (lettered binding posts). All popular designations and plain. Packed 50 of each designation per box. List: 100 to 750, 6c each; 800 and up, 5c each; plain, 1c less.

# Remember This Mark and Look for It



## It Is Your Guarantee of reliable, dependable radio apparatus

"WALNUT Troubleproof" Radio Products include: Unbreakable, unconditionally guaranteed tube sockets, "B" Battery and Inductance Switches, Variable Condensers (plain and Vernier), Vernier adjusters, Dials, Variable Grid Resistances, Lettered Binding Posts, etc. Write for literature.

"Makers of good goods only"  
**WALNUT ELECTRIC MFG. CO.**  
Dept. 452 Chicago



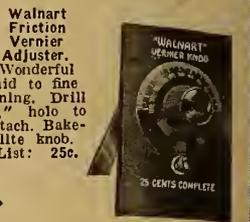
Walnut 10 Point Inductance or "B" Battery Switch with dial. Drill only one 9/32" hole for mounting. Adjustable to any panel thickness. Positive contacts. Bakelite Dilecto base. List: \$1.25.



Walnut Variable Condensers, Vernier Type. Do not "cut out" or develop wobbliness. Plates accurately pressed, permanently aligned and locked in slotted studs securely fastened in Bakelite end plates. List: 13-pl., \$4.00; 23-pl., \$4.50; 43-pl., \$5.50.



Walnut Dials. Moulded with tapered knobs. 2" diam., 3/4" shaft. List: 25c; 3" diam., 35c; 3 1/2" diam., 45c; 4" diam., 50c.



Walnut Friction Vernier Adjuster. Wonderful aid to fine tuning. Drill 1/4" hole to attach. Bakelite knob. List: 25c.

# GAROD

## The public wants Power

Here it is in the New Garod line

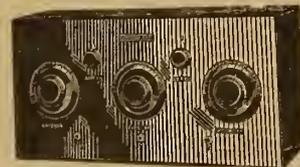
- Power—to produce great volume.
- Power—to bring in distant stations.
- Power—to work through local stations.
- Power—to moderate or intensify volume.
- Power—to render the original quality of tone transmitted.
- Power—to select programs.
- Power—to get the best out of the program



The Garod Georgian  
Rich brown burled walnut, with door-panel borders of inlaid ebony and holly—5 tube model—built-in loud speaker—battery compartments and accessory drawer. Will grace the finest drawing room—provide the best in radio reception. Size 35 1/2" long—16 3/8" deep—42 1/2" high \$400.00



The Garod V  
Genuine mahogany highly finished cabinet—graceful 15° sloped genuine mahogany panel—carved feet, five inch dials—double reading Weston voltmeter—5 tube model. Size 34 3/8" long—13 3/4" deep—11 3/8" high \$195.00



The Garod RAF  
The receiver that made GAROD famous. Added mechanical improvements—4 tube model—with which you are familiar. Size 19 1/2" long—7 3/8" deep—10" high. \$135.00

SEE OUR EXHIBITS AT  
First  
Radio World's Fair  
Madison Sq. Garden  
New York  
Sept. 22 to 28, 1924

Third Annual  
Chicago Radio Show  
Coliseum, Chicago, Ill.  
Nov. 18 to 23, 1924



The **GAROD** Corp.  
120 Pacific Street, Newark, N. J.

# HOOVER CALLS THIRD CONFERENCE

## CONFEREES TO COOPERATE IN NEW RULINGS

Result of Past Meetings Reduced Interference and Improved Service in General

### For Better Regulations

Will Talk Over Limitation of Power; Division of Time; and Many Other Things

WASHINGTON, D. C.—Secretary of Commerce Hoover has called the Third Radio Conference to be held in this city on September 30, "for the better voluntary regulation of Radio." In this connection the following official statement was made public by the department of commerce telling of the conference and its aims.

"Announcement was made today by Secretary Hoover of the calling of the Third National Radio Conference for the better voluntary regulation of Radio. The conference will be held at Washington, beginning September 30.

"Two such conferences have already been held, one in February, 1922, and one in March, 1923, both of which were generally attended by the persons and organizations interested. The result has been a lessening friction and misunderstanding through the voluntary cooperation of the industry, the public and the department of commerce, especially in the reduction of interference and the improvement of service.

#### Conference Has Heavy Program

"The growth of Radio and particularly the multiplication of broadcasting stations and the consequent congestion of the air has made necessary a consideration of many subjects and perhaps a revision of some present methods. Some of the matters which will be discussed and considered at the conference are:

"Revision of the present frequency or wave length allocations to reduce interference: Use of high frequencies or short waves: Classification of broadcasting stations: Possible discontinuance of Class C stations: Interconnection of broadcasting stations: Limitation of power: Division of time: Zoning broadcasting stations: Means for distinguishing the identity of amateur calls from foreign countries: Interference by electrical devices other than Radio transmitting stations: Relations between government and commercial services; and such other topics as may be proposed by the conference.

#### Groups to Be Represented

"To facilitate the work of the conference the various groups in the Radio field will be asked to name representatives who will constitute the formal advisory committee of the conference. As at present planned, the groups to be represented will be as follows:

"Listeners, Marine Service, broadcasting (one from each inspection station,) Engineering, Transoceanic Communication, Wire inter-connections, Manufacturers, Amateurs point-to-point communication, Government departments.

"The committee so constituted will hold public hearings. All persons or organizations having any suggestions to make or views to express upon any features of Radio activity are urged to attend and will have full opportunity to be heard.

#### Conclusions Must Be Voluntary

"Some of the matters suggested for consideration are not within the regulatory control of the secretary. As to such matters, any conclusions reached by the conference can become effective only by voluntary adoption by the interests affected. As to the features falling within the powers of the secretary the recommendations of the conference will be advisory to the department."

It is understood that Secretary Hoover feels that the real public service of the future lays in local broadcasting stations which will pick up long distance stations and rebroadcast standardized programs.

#### Mexico Needs Regulations

MEXICO CITY.—The use of Radio in Mexico has been disappointing. Owners of Radio sets near San Inis Potosi hold that it is peculiarly afflicted with static. Then there is much annoyance from Radio-telegraph stations in Mexico and ships on the Gulf of Mexico using the same wave lengths as the broadcasting stations. Regulations are needed badly.

## Broadcasting Relieves Patients of Hospital

Physicians Agree Radio Helps Pass Monotonous Hours

SCHENECTADY, N. Y.—Physicians and patients are agreed that broadcasting is doing much to relieve the monotonous hours of sanatorium treatment and by so doing, is to some extent, aiding treatment. Recent letters received by WGY from the Central Maine sanatorium at Fairfield, Maine, indicate that this institution has gone to considerable expense to provide Radio reception for all the patients.

At the Central Maine sanatorium, Fred Soucie, the operator, reports that 126 head sets are connected to a central receiving set enabling all the patients, even in isolated buildings to hear distant stations. Over 2,000 feet of wire were required to make the installation. By means of a switchboard the operator may switch off any building he desires. In addition there is a microphone by means of which a member of the hospital staff may address all the patients at one time—in other words, the hospital has its own broadcasting station within the limits of its buildings.

## DEALERS CLAIM BIG CALL FOR CRYSTALS

COLUMBUS, OHIO.—An unexpected demand for crystals has developed recently, local Radio dealers announce. Strangely enough, a great many of the calls for crystals come from those who have built tube sets. When asked for an explanation the buyers reply: "Oh, I never had a crystal set. Just want to see how they work."

## Noted Artists Welcomed

on Air by All Listeners In

NEWARK, N. J.—The famous Carolinians orchestra under the direction of Charles M. Koch, whose frequent concerts on WOR programs have proved such a welcome Radio feature, recently broadcast their third concert from the popular New Jersey station.

Few musical aggregations playing via Radio in the East have met with the acclaim accorded the Carolinians and they have been made a permanent WOR feature. Special orchestrations mark all concerts by them. They will be heard again soon by WOR listeners.

## CUT CLASSES TO PICK UP RETURNS

Only Students Enrolled in Electrical Course Will Be Allowed in Laboratory

COLUMBUS, OHIO.—Trades High school authorities announce that no students other than those studying electricity will be permitted to enter the electrical laboratory while world's series ball games are in progress. And here's the reason:

The electrical students have a Radio receiving set in the laboratory and they have constructed an efficient score board, operated electrically, which indicates the progress of the game play by play.

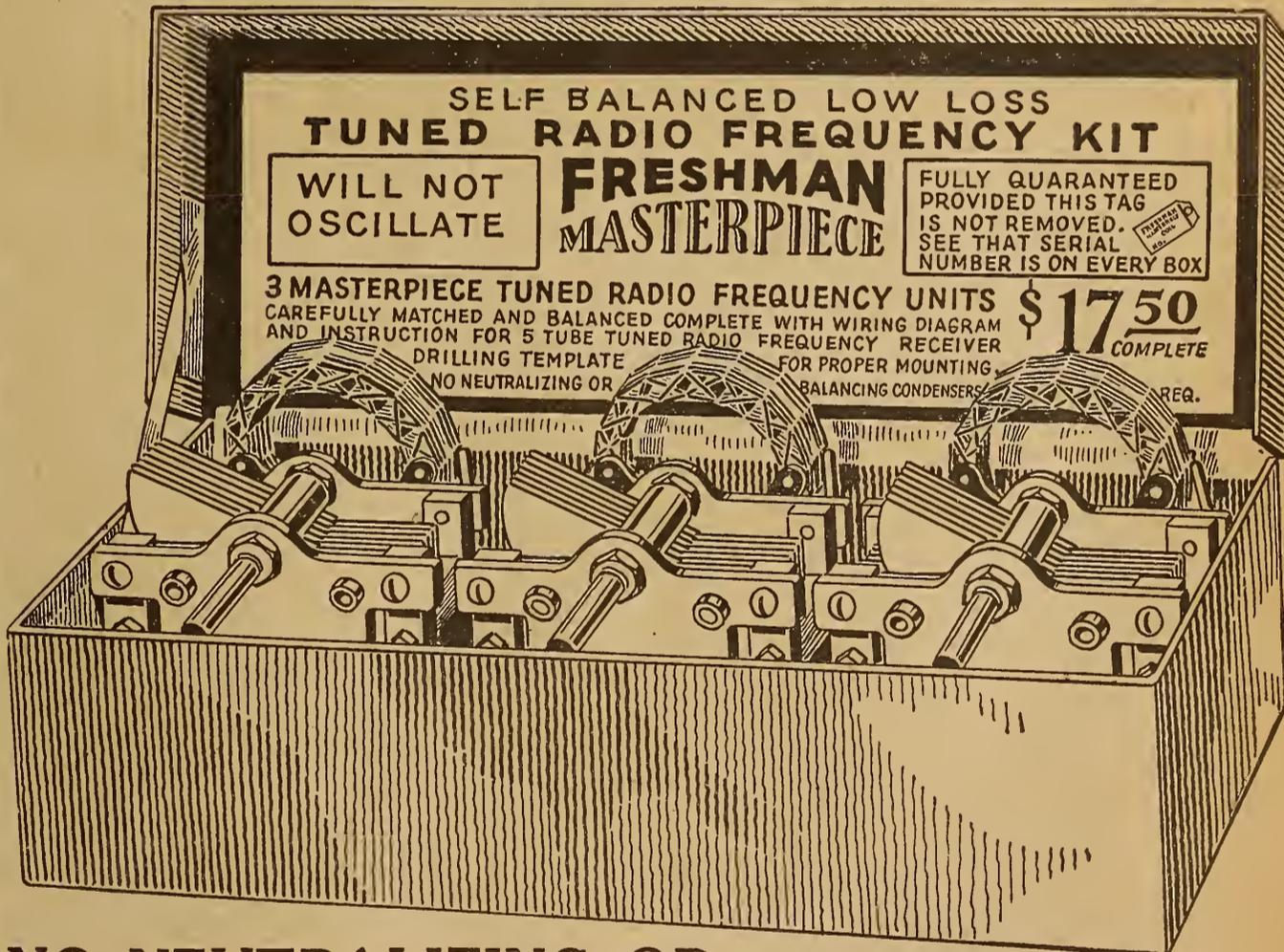
Last year while the games were on, various classes lacked several members. An extensive search resulted in locating them in the electrical laboratory, cheering their favorite teams.

There is a large demand for entrance to the electrical course this year.

Station WSAI, U. S. Playing Card company, Cincinnati, is experimenting with a new type of Western Electric capacity microphone. The standard "mike" cage is used on the new pick-up.

# It's Results that Count!

When you build a 5 tube tuned radio frequency receiver you want a set that does not oscillate and does not require laboratory testing before it can be of service.



## NO NEUTRALIZING OR BALANCING CONDENSERS REQUIRED

With these marvelous units you can easily build a five tube tuned Radio Frequency Receiver that will be highly selective as well as a remarkable distance getter, bringing in all stations with pleasing clarity and volume.

Kit consists of 3 Masterpiece Tuned Radio Frequency Units carefully matched and balanced. Complete with wiring diagram and instructions for building any 5 tube tuned radio frequency receiver and also drilling template for proper mounting . . . . .

# \$17.50

CHAS. FRESHMAN CO., INC., 106 Seventh Avenue, New York City

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

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

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. If in addition, your city uses daylight saving time, add one hour to this result. This table includes only the evening Radiocasts, and, on Sunday, the late afternoon program.

STATIONS IN ORDER OF WAVE LENGTHS USED

Table with columns: Meters Call, Meters Call, Meters Call, Meters Call, Meters Call, Meters Call. Lists stations and their corresponding wave lengths.

New Death Ray "Expert" Sees Number of Streets on Sun; Cafe Is Laboratory

Former Manager of Negro Prizefighter Astonishes French Scientists with Claims—New Ray Called "Kleginite"—Ordinary Camera Using This Marvelous Invention Takes Photographs 30 Miles Distant

PARIS.—One of the most bizarre by-products of the "death ray" craze is the appearance in the limelight, in Paris, of a new "scientist," one Richard Clegin, previously known chiefly as the former manager of Jge Gans, the negro prizefighter.

lack for supporters and followers, even among writers for the press. Mr. Clegin has offered to bet one thousand dollars that he can kill an animal with his ray but no tests have been staged.

Mr. Clegin's office, in his own words, is at the Ritz bar, in Paris. From this point of vantage he has announced to Paris journalists the discovery of a new ray, hitherto quite unknown, which he has named "Kleginite."

With this marvelous invention Mr. Clegin announces that he can take photographs at a distance of 30 miles, without anything but an ordinary camera—and one-tenth of one per cent of Kleginite—being necessary.

With this new ray Mr. Clegin has made some pictures of the sun which he has shown to Paris astronomers. Some light streaks on these photographs are explained by the discoverer as being photographs of city streets on the sun; it being his idea that the sun is a cold planet, not too far away, and inhabited by folks who live much as we do on earth.

COLUMBUS, OHIO.—Paul McCullough, manual training instructor at Barret Jr., High school here, is laying elaborate plans for the Radio building feature of the course during the present school year.

High School Plans Sets for Students

Finished Article Given Severe Test Before Leaving Shop

Greater Results Than Ever!

—send for this diagram

The Nutron Solodyne (double-grid) Tube acts as both oscillator and modulator in The Super-Heterodyne Circuit, thereby not only eliminating one of the tubes, but obtaining greater efficiency as well. In Reflex Sets the Nutron Solodyne (double-grid) Tube can be used as both detector and amplifier (dual amplification), thereby doing away entirely with the crystal or detector tube.

Use "Silben Spot" Tubes

After years of chemical and electrical research a startling process of tube treatment has been discovered! What appears to be an ordinary 6-volt storage battery tube actually works like a \$12 power tube. It makes weak reception strong and good reception stronger.

Nutron Matched Tubes

Mr. Set Manufacturer: You can now guarantee every one of your sets working perfectly on tube operation. Our Service Department will match tubes for your particular set, pack them in cartons of 3 or 6, as required, each tube individually marked and guaranteed correct for your set.

NOTE.—We recommend to owners of Super-Heterodyne and reflex sets the use of Nutron Matched Tubes in conjunction with the Nutron Solodyne (double-grid) Tube. The Silben Spot (Pat. Pending) on all these tubes is your guarantee of perfect satisfaction with your set.

NUTRON

NUTRON MFG. CO. 723 MAIN AVE. PASSAIC, N. J.



RADIO CABINETS ARE NEAT

Away with the mussey radio set! House it neatly in a M-B-G Radio Cabinet. The best value to be found. Large ones—small ones—a variety of styles. All made of Oregon Fir. Selected for their perfect grain. They are protecting thousands of home-made sets the country over.

Order To-day

Choose your style—from the display at your radio dealer—or if you wish send direct to us. We will send it to you promptly. FREE with every cabinet comes complete and fascinating instruction on how to stain to harmonize with any color scheme or furniture.

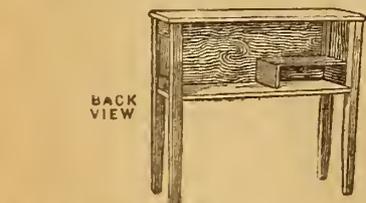
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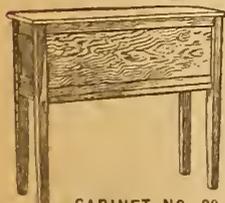
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# WHAS HAS BIRTHDAY PARTY MONDAY

## Wednesday, September 10

**CHYC**, Montreal, Can. (Eastern, 341), 10 p. m., orchestra.  
**CKAC**, Montreal, Can. (Eastern, Daylight, 425), 1:45 p. m., Mount Royal hotel luncheon concert.  
**KDKA**, East Pittsburgh, Pa. (Eastern, 326), 11:15 a. m., concert; 5:30 p. m., dinner concert by Scalzo's orchestra from the Pittsburgh Athletic association; 6:30, the children's period, Richard the Riddler; 8, concert arranged by A. Douglas Cullum, Clarksburg, West Va.  
**KFI**, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., vocal concert; 7:30-8, "Mammy" Simmons; 8-9, Evening Herald, surprise night; 9-10, studio program; 10-11, orchestra; 11-12, Ambassador hotel Cocoanut Grove orchestra.  
**KFNH**, Shenandoah, Ia. (Central, 266), 7:30 p. m., program by Rebeahs.  
**KFOA**, Seattle, Wash. (Pacific, 455), 8:30 p. m., Metropolitan Building company, Freda Tilden, director; address, Dr. Green.  
**KFSG**, Los Angeles, Calif. (Pacific, 278), 2:30-4:30 p. m., divine healing service, Aimee Semple McPherson; 6:30-7:30, Gray studio program.  
**KGO**, Oakland, Calif. (Pacific, 312), 3 p. m., musical program; 4:5-5:30, concert orchestra of the Hotel St. Francis, San Francisco.  
**KGW**, Portland, Ore. (Pacific, 492), 3:30 p. m., talk; 8, concert by Louis Kaufman, violinist; 10, dance music by George Olsen's Metropolitan orchestra of the Hotel Portland.  
**KHJ**, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Oats' Tavern orchestra Fred C. McNabb, speaker; 6-6:30, Art Hickman's concert orchestra, direction, Edward Fitzpatrick; 6:30-7:30, children's hour, Dick Winslow, juvenile reporter; baby Muriel McCormack; 8-8:30, Dr. M. F. Baumgardt, lecture; 8:30-10, concert, courtesy, Platt Music company; 10-11, Art Hickman's dance orchestra.

## Headliners of the Week

**EVERYONE** who has an unpleasant idea of nettles will change his or her mind Wednesday when "The Nettles" broadcast from WBZ, Springfield. There will be amusing readings by Belle Nettles and instrumental music by the rest of the Nettles, which will contradict anything said hitherto about them. WMAQ this same evening will give its first Radario. The initial play will be "Sham"

Thursday, KGO will present an evening of Spanish music. Prof. Zubano will play Spanish compositions and Pearl Rendon will sing. Prof. Galeno will give a talk on "Spain" in his native language. All his Radio pupils will undoubtedly understand him.

Friday night WCAP will Radiocast the National Defense Day talk of President Coolidge and General Pershing. WEAJ, WSB, WFAA, WMAQ, KSD, KPO and many others will re-

lay these messages. Later on in the evening a jolly group of minstrels will enter gaily via Radio and WOA. The Misner Merry Minstrels will make you dream of olden days. Still later on tune in for KFI, Los Angeles, and hear the Tyrolean Zither club.

A French orchestra will entertain the listeners in who tune for WJZ Saturday. This program is given by courtesy of the S. S. France steamer. WLS will broadcast the State Fair program from Springfield, Illinois, so that farmers unable to attend may tune in Sunday night.

All kinds of surprises are promised by WHAS Monday, when the Station celebrates its second birthday. The Domino Novelty orchestra, which presented the first concert, will be on the program.

Bachelors are invited to tune in Tuesday night for WGY. The WGY Student players will give "A Single Man."

of old time square dance and quadrille tunes played by the Old Time String trio.  
**WQL**, Chicago, Ill. (Central, Daylight, 447.5), 11-12 a. m., home economics program; 3-4 p. m., Helen Harrington Downing, talk; 7-8, dinner concert by Ralph Williams and his Rainbo Gardens orchestra; Lillah Older Bell, musical and original readings; Lancaster Smith, basso; Mrs. Lancaster Smith, pianist; Dorothea Schubert, Jugo Slav, soprano; 10-2 a. m., Ralph Williams and his Rainbo Gardens orchestra; the Melodians; George A. Little and Larry Shay; harmony singers; Dolores Edwards, contralto; Manuel Rodriguez, tenor.  
**WRC**, Washington, D. C. (Eastern, Daylight, 469), 3 p. m., fashion talk; 3:10, song recital; 3:45, piano recital; 3:50, current topics; 4, song recital; 6, stories for children by Peggy Albion.  
**WSA**, Cincinnati, Ohio (Central, Daylight, 309), 10 p. m., tenor solos, Sam Pusateri; violin solo, Eugene Perazzo; piano solos, Frances Corinne Jones.  
**WSB**, Atlanta, Ga. (Central, 429), 12 m., entertainment; 8 p. m., election returns.  
**WTAM**, Cleveland, Ohio (Eastern, 390), 8 p. m., program of Spanish music arranged by Cleveland Plain Dealer; Mrs. Mary Kettelman, Mrs. J. M. Goldswort, Herbert Davis, Fred A. True of Cleveland Operatic quartette, direction Walter Logan; Carl Rupp's Hollenden hotel orchestra.  
**WWJ**, Detroit, Mich. (Eastern, 517), 8 a. m., setting-up exercises, R. J. Horton; 9:30, talk, women's editor, Detroit News; 12 m., Detroit News orchestra; 8:30 p. m., Detroit News orchestra, Templeton Moore, tenor.

## Thursday, September 11

**CKAC**, Montreal, Can. (Eastern, Daylight, 425), 9 p. m., concert.  
**CNRM**, Montreal, Can. (Eastern, 341), 9 p. m., musical program.



Mrs. Edna K. Barker is the director of the Spanish lessons recently started from KPO, San Francisco. Write to her for your lessons.



Fiddlin' John Carson is a Radio made man. Before there were Radiocasting stations John Carson was not known outside his own town, Atlanta, Georgia, and now everybody knows him. If you don't, tune in for WSB Monday, September 15. WFI, Philadelphia, claims Loretta Kerk as its own official pianist. That is the reason you never hear her from other stations.



**KLX**, Oakland, Calif. (Pacific, 509), 8-10:20, studio program, Gallagher and Efferle; Orpheus Instrumental trio, Phillip C. Tait, violinist; Frederick R. Wilkins, flutist; Howard F. Eastwood, pianist; Irene Roberts, soprano; "A Radio Salesman's Life," Chris Efferle; Hazel Carlson Wood, contralto; Dela Roberts, pianist; American Theater orchestra, Owen Sweeten, director; Melba Farwell, flutist; Dean Cross, baritone.  
**KPO**, San Francisco, Calif. (Pacific, 423), 1-2 p. m., Rudy Selger's Fairmont hotel orchestra; 2:30-3:30, Cabrila cafe orchestra; 4:30-5:30, Fairmont hotel orchestra; 7-7:30, Rudy Selger's orchestra; 8-11, E. Max Bradford's Versatile band.  
**KQV**, Pittsburgh, Pa. (Eastern, Daylight, 270), 10:30-11 a. m., music; 3-3:30 p. m., music; 8-9, popular song revue presented by Ben and Thelma Fields, Pittsburgh entertainers; 9-10, musical program presented by the Music Box sextette, dance orchestra of Pittsburgh, playing all the late and popular hits; soloists and special entertainer for this program will be Fred Hughes.  
**KSD**, St. Louis, Mo. (Central, 546), 7 p. m., concert by Abrecht's concert ensemble.  
**KYW**, Chicago, Ill. (Central, Daylight, 536), 6:45 p. m., children's bedtime story; 7-7:30, dinner concert; 7:30-8, program, 8-8:30, musical program; 8:30-9:45, stage reviews; 9:45-10, music; 10:45-1:30 a. m., midnight revue.  
**PWX**, Havana, Cuba (Eastern, 400), 8:30 p. m., band concert.  
**WBAV**, Columbus, Ohio (Eastern, 423), 12 m., Ila Lorhach Owens, pianist.  
**WBBR**, New York, N. Y. (Eastern, Daylight, 273), 8 p. m., Frances Mayer, soprano; 8:15, bible study on the Progression of the Divine plan; 8:45, Frances Mayer.  
**WBZ**, Springfield, Mass. (Eastern, Daylight, 337), 6 p. m., dinner concert; 7:20, talks; 7:30, bedtime story; 7:40, concert by the WBZ trio; 8:30, dance music; 9, concert by "The Nettles"; 11:30, Leo Reisman and his Hotel Brunswick orchestra, songs by Bill Coty and Jack Armstrong.  
**WCAE**, Pittsburgh, Pa. (Eastern, Daylight, 462), 6:30 p. m., dinner concert, William Penn hotel; 7:30, Sunshine girl; 9:30, musical program.  
**WCAP**, Washington, D. C. (Eastern, 469), 8-9 p. m., program from WEAJ, N. Y.; 9-9:15, "Science News of the Week," Dr. W. E. Tisdale.  
**WCX**, Detroit, Mich. (Eastern, 517), 4:15 p. m., musical program; 6, dinner concert; 7, musical program.  
**WDAF**, Kansas City, Mo. (Central, 411), 3:30-4:30 p. m., the Star's Radio trio; 6-7, school of the air, piano tuning in number on the Duo-Art; address, speaker from the Meat Council of Greater Kansas City; weekly health talk, auspices Health Conservation association; the Tell-Me-a-Story lady; music, Carl Nordberg's Plantation players, Hotel Muehlebach; 8-9:15, program by the Kansas City Federated Music clubs; 11:45-1 a. m., nighthawk frolic, the "Merry Old Chief" and the Plantation players, Hotel Muehlebach.  
**WDAZ**, Philadelphia, Pa. (Eastern, Daylight, 395), 11:45 a. m., daily almanac; 12:02 p. m., Stanley theater organ recital; 12:50, religious service, auspices Philadelphia Federation of churches; 12:45, Arcadia cafe concert orchestra; 2, Arcadia cafe concert orchestra; 1:30, Edna Finestone, pianist; 7:30, Dream Daddy's bedtime stories; 8, Arnold Abbott's conversation corner; Edna Finestone, pianist; 10, Arcadia cafe dance orchestra.  
**WEAF**, New York, N. Y. (Eastern, Daylight, 492), 11-11:15 a. m., Minnie Well, pianist; 11:15-11:45, young mother's program; 4-4:15 p. m., Harry Jentes, pianist;

4:45-5, Warren Scofield, tenor; 6-7, dinner music, Waldorf-Astoria hotel; 7-7:30, Bob Fridkins Clifford Lodge orchestra; 7:30-8, American Agriculturist; 8-8:30, Gordon male quartette; 8:45-9, Cora S. Griffin, contralto.  
**WEAO**, Columbus, Ohio (Eastern, 360), 1:30 p. m., educational lecture, member Ohio State university faculty; 1, farm talk, faculty member; music, university artists.  
**WFAA**, Dallas, Tex. (Central, 476), 12:30-1 p. m., musical recital by entertainers from a Dallas theater.  
**WFI**, Philadelphia, Pa. (Eastern, Daylight, 395), 1 p. m., Meyer Davis Bellevue Stratford concert orchestra; 3, Loretta Kerk, pianist; report closing prices, Chicago grain market; Sol Zaleh and his Rose Tree cafe dance orchestra; 6, Sunny Jim, the kiddies' pal; 6:30, Meyer Davis Bellevue Stratford concert orchestra.  
**WGAQ**, Shreveport, La. (Central, 252), 8 p. m., musical program; 10-12, Ramblers Hotel Youreux orchestra.  
**WGN**, Chicago, Ill. (Central, Daylight, 370), 6:30-7:30 p. m., Drake concert ensemble and Blackstone string quintette; 8:30-9:30, Sara Regina Rabiro, Fred Agard, talk by Major General Henry C. Hale; 10:30-11:30, Bert Davis; Jack Chapman's orchestra.  
**WGR**, Buffalo, N. Y. (Eastern, Daylight, 319), 12:30-1 p. m., George Albert Bouchard, organist; 6:30-7:30, dinner music; 8:50-9, address by Henry Selheimer; 9-11, concert Niagara Battery corporation, C. F. Bettinger, director; 11:30, supper dance music, Vincent Lopez, Hotel Skatler orchestra.  
**WGY**, Schenectady, N. Y. (Eastern, 380), 2 p. m., international polo match between Great Britain and United States at Meadowbrook, described by J. Andrew White and Major A. W. Rudd; 5, news bulletins; 5:30, adventure story.  
**WHAS**, Louisville, Ky. (Central, 400), 4-5 p. m., selections by the Alamo theater orchestra, selections by Dick Quinlan's Gold Derby orchestra; 7:30-9, concert by Rosson's entertainers.  
**WHB**, Kansas City, Mo. (Central, 411), 7-8 p. m., guitar solos, Orna L. Gibbs; address on "The Home Beautiful," speaker to be announced; music, Sweeney instrumental trio.  
**WHN**, New York, N. Y. (Eastern, Daylight, 360), 2:15-2:30 p. m., Marguerite Ackerman, soprano; 2:30-2:45, Wright & Bessinger; 2:45-3:15, Al King's Original Louisiana five; 5-5:30, Lizzy Meyer's De Luxe orchestra; 6:30-7:15, Oloft Vall's trio and Paul Specht's Alamae orchestra; 7:30-8, Billy Page's Broadway syncopators; 8-8:15, Jos. C. Wolfe, baritone; 8:15-8:30, Vincent Lane, tenor; 8:30-8:45, boy's period, Wm. J. Stuart; 8:45-9, Minnie Bankes, pianist; 9-9:30, Chas. Strickland's Pallades Park orchestra; 9:30-10, Gem Safety Razor orchestra; 10-11, Clover Gardens orchestra.  
**WHO**, Des Moines, Ia. (Central, 526), 7:30-9 p. m., dance program, given by the Bankers Life Radio orchestra, W. L. Marsh and Stewart Dulaney, directors.  
**WIP**, Philadelphia, Pa. (Eastern, Daylight, 509), 10 a. m., seashore gossip; 10:10, Bernard MacFadden's health talks; 3 p. m., "What the wild waves are say-

ing"; 3:30, Comfort's Philharmonic orchestra; 4, Bob Leman's dance orchestra; 6:05, Eddie Elkins' dance orchestra; 7, Uncle Wip's bedtime stories.  
**WJZ**, New York, N. Y. (Eastern, Daylight, 455), 7 p. m., Irving Selzer's cafe Boulevard orchestra; 8, Wall Street Journal review; 8:15, Mystery Magazine's "By the Breath of a Hair," part two; 8:45, talk; 9:15, U. S. Army night, 16th Infantry band, speeches; 10:30, Billy Wynnes' Greenwich Village Inn orchestra.  
**WKAQ**, San Juan, Porto Rico (Central, 360), 6-8 p. m., municipal band.  
**WLS**, Chicago, Ill. (Central, Daylight, 345), 6:30 p. m., Ralph Emerson at the Barton organ; 6:50, Ralph Emerson at the Barton organ; 7:05, Isham Jones' Hotel Sherman College Inn orchestra; 7:20, James J. Whalen, tenor; 7:35, Isham Jones; 7:45, lullaby time; 8, juvenile program; 9-10, farm program; 10, orchestra; 10:15, poem period; 10:30, Isham Jones' orchestra; 10:40, Glenn Rowell and Ford Rush time.  
**WLW**, Cincinnati, Ohio (Central, Daylight, 423), 8 p. m., Virginia entertainers; 9, "The Great Divide," arranged in Radio form by Mr. and Mrs. Henry Florsheim; soprano solos, Marion Manship, Mme. Tibus, accompanist.  
**WMAQ**, Chicago, Ill. (Central, Daylight, 447.5), 4:30 p. m., musical program; 6, Chicago theater organ; 6:30, stories for children; 9, talk; 9:15, violinist.  
**WMM**, Cincinnati, Ohio (Central, Daylight, 309), 2:30 p. m., surprise Radio wedding; special musical program; 8, miscellaneous musical program; 9, Jimmie Dearing's Rainbow orchestra, Joe Rengehausen, director.  
**WNYC**, New York, N. Y. (Eastern, Daylight, 526), 7:30-7:45 p. m., Police Alarms; 8:15-10, concert from Central Park; 10:15-10:30, timely topics, F. P. Bent; 10:30-10:45, Police Alarms; 11-11:15, Official weather forecast.  
**WOC**, Davenport, Ia. (Central, 484), 8 p. m., organ recital; baritone; Erwin Swindell, organist, reader.  
**WOO**, Philadelphia, Pa. (Eastern, Daylight, 509), 11 a. m., Mary E. Vogt, organist; 12:02 p. m., Wanamaker crystal tea room orchestra; Robert E. Golden, director; 4:45, Mary E. Vogt, organist; 7:30, A. Candefori and his Hotel Adelphia roof garden concert orchestra; 8:15, organ recital, Mary E. Vogt; 9, WOO orchestra, Robert E. Golden, director; 10, Hotel Adelphia dance orchestra, A. Candefori, director.  
**WOR**, Newark, N. J. (Eastern, Daylight, 405), 2:30-2:45 p. m., Dorothy Drummond, pianist; 2:45-3, Leona Hunter Pierce, soprano; 3:30-3:45, Dorothy Drummond; 3:45-4, Leona Hunter Pierce; 6:15-6:55, "Music While You Dine," Sammy Halpern and his orchestra; 7-7:15, resume of the day's sports, Jolly Bill Steinke; 8-8:45, Gene Ingraham's Great Notch Inn orchestra; 8:45-9:15, program through courtesy Mmc. Florence Wessel; 9:30-10:15, Great Notch Inn orchestra; 10:15-10:45, Mme. Florence Wessel; 10:45-11:15, Jos. J. White, tenor.  
**WOS**, Jefferson City, Mo. (Central, 440.9), 8 p. m., agricultural address; 8:20, musical program consisting

**KDKA**, East Pittsburgh, Pa. (Eastern, 326), 11:15 a. m., concert; 5:30 p. m., dinner concert by the KDKA Little Symphony orchestra, Victor Saudek, conductor; 6:30, the children's period, some songs for the kiddies; 7:15, program arranged by the National Stockman and Farmer; 8, concert by the Little Symphony orchestra and the Brackenridge Glee club, under the direction of W. V. Hunter; 10:05, concert from the Pittsburgh Post studio.  
**KFI**, Los Angeles, Calif. (Pacific, 469), 6:45-8 p. m., Y. M. C. A. lecture and quartette; 8-9, Ambassador hotel Cocoanut Grove orchestra; 9-10, studio program; 10-11, vocal program.  
**KFKX**, Hastings, Nebr. (Central, 341), 9:30 p. m., studio program.  
**KFNH**, Shenandoah, Ia. (Central, 266), 7:30 p. m., concert, Harris Laundry.  
**KFSG**, Los Angeles, Calif. (Pacific, 278), 3:30-4:30 p. m., organ recital, courtesy, R. Ernest Ballard; 7:30-9:15, auditorium service, water baptism and sermon, Aimee Semple McPherson; 9:15-10, Gray studio, featuring Silver band; 10-11, organ recital, courtesy, Esther Fricke Green.  
**KGO**, Oakland, Calif. (Pacific, 312), 4-5:30 p. m., concert orchestra of the Hotel St. Francis; 8, studio program, piano solos, soprano solos, bass solo, contralto solos, baritone solos; burlesque, humorous dialogue, popular songs.  
**KGW**, Portland, Ore. (Pacific, 492), 3:30 p. m., children's program; 8:15, studio concert by George Olsen's Metropolitan orchestra of the Hotel Portland; Herman Kenin, director; 10:30, Hoot Owls.  
**KHJ**, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Wayne West and his westerners; 6-6:30, Art Hickman's concert orchestra; 6:30-7:30, children's hour, Dickie Brandon, screen juvenile; 8-9, concert, courtesy, Continental National bank, featuring Sylvia Harding, violin, Florence Sawyer, cello and Florence Joy, piano; Thorleif Olsen, baritone; 9-10, concert, Filippino string orchestra, courtesy, Blue Bird cafeteria; 10-11, Art Hickman's dance orchestra.  
**KPO**, San Francisco, Calif. (Pacific, 423), 1-2 p. m., Rudy Selger's orchestra; 2:30-3:30, musical matinee; 4:30-5:30, Rudy Selger's Fairmont hotel orchestra; 5:30-6:30, children's hour; 7-7:30, orchestra; 8-9, organ recital; 9-10, program; 10-11, E. Max Bradford's Versatile band.  
**KYW**, Chicago, Ill. (Central, Daylight, 536), 4 p. m., afternoon frolic; 7-7:30, dinner concert; 8-8:20, "Twenty Minutes of Good Reading"; 8:20-9:15, musical program; 9:15, talk; 10-11:30, "At Home" program.  
 (Continued on page 16)

# NATIONAL DEFENSE MESSAGE FROM

## Where to Hear Concerts

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

**Wednesday:** CHYC, CNRO, KDKA, KFI, KFNF, KFOA, KFSG, KHJ, KPO, KSD, KYW, PWX, WBBR, WDAF, WCAE, WCAP, WCX, WDAF, WDBR, WDAF, WBBH, WGI, WGR, WHAS, WHB, WHN, WHO, WJAR, WJZ, WKAQ, WLS, WLW, WMAQ, WMH, WOC, WOO, WOR, WOS, WQJ, WSB, WTAM, WTAS, WWJ.

**Thursday:** CNRM, KDKA, KFI, KFNF, KFSG, KGO, KHJ, KPO, KYW, WBBR, WBBZ, WCAE, WCAE, WCB, WCX, WDAF, WDAF, WEAO, WBBH, WFAA, WFI, WGI, WGY, WHAS, WHB, WHN, WIP, WJAX, WJY, WJZ, WLAG, WLS, WLW, WMAQ, WMC, WMH, WOAW, WOC, WQJ, WRC, WSAI, WSB, WTAS, WWJ.

**Friday:** CNRO, CNRT, KDKA, KFI, KFNF, KFOA, KFSG, KHJ, KSD, KYW, WBAV, WBBZ, WCAE, WCAP, WCAE, WCX, WDAF, WDAF, WDAF, WBBH, WFAA, WGR, WGY, WHAS, WHB, WHK, WHN, WHO, WJAR, WJY, WJZ, WLS, WMAQ, WMC, WOAW, WOC, WOO, WOS, WQJ, WRC, WSB, WTAS, WWJ.

**Saturday:** CKAC, KDKA, KFI, KFNF, KFSG, KGO, KHJ, KPO, KSD, KYW, PWX, WBBR, WBBZ, WCAE, WDAF, WDAF, WBBH, WFAA, WFI, WGI, WGN, WGY, WHAS, WHK, WHN, WIP, WJAR, WJAX, WJAZ, WJZ, WLS, WMAQ, WMC, WMH, WOAW, WOC, WOR, WQJ, WRC, WSAI, WSB, WTAM, WTAS, WWJ.

**Sunday:** CHYC, KFI, KFNF, KFSG, KHJ, KPO, WBBR, WBBZ, WCX, WDAF, WBBH, WFAA, WGI, WHAA, WHK, WHN, WHO, WIP, WJZ, WLS, WLW, WOAW, WOC, WOS, WQJ, WTAS.

**Monday:** KFI, KFNF, KFOA, KGO, KPO, WBBR, WBBZ, WCB, WCX, WDAF, WDAF, WFAA, WGR, WGY, WHAZ, WHB, WHN, WHO, WLW, WMC, WOAW, WOC, WOO, WOS, WSAI, WSB, WTAM, WTAS, WWJ.

**Tuesday:** CKAC, KFI, KFNF, KFSG, KGO, KHJ, KPO, KYW, WBAV, WBBZ, WCX, WDAF, WFAA, WFI, WGI, WGN, WGY, WHB, WHN, WHAA, WHAS, WIP, WJY, WJZ, WLW, WMAQ, WMC, WOAW, WQJ, WRC, WSAI, WSB, WTAS, WWJ.

## Thursday, September 11

(Continued from page 15)

**WAAW, Omaha, Neb. (Central, 286), 8-9 p. m.,** Sunday school lesson, Rev. E. M. Brown; third talk on parks, Union Pacific Agricultural department.  
**WBAV, Columbus, Ohio (Eastern, 423), 12 m.,** religious service; sacred music, Columbus Council of churches.  
**WBBR, New York, N. Y. (Eastern, Daylight, 273), 9:10 p. m.,** piano recital by the pupils of Mrs. L. D. LaForge; 9:25, International Sunday school lesson for Sunday, Sept. 14; 9:45, piano recital.  
**WBZ, Springfield, Mass. (Eastern, Daylight, 337), 6 p. m.,** Leo Reisman's Hotel Lenox ensemble; 6:30, songs; 6:40, orchestra; 7:30, bedtime story.  
**WCAE, Pittsburgh, Pa. (Eastern, Daylight, 462), 6:30 p. m.,** dinner concert, William Penn hotel; 9:30, Moores Cafeteria Weekly Radio review, E. T. Moores, manager.  
**WCX, Detroit, Mich. (Eastern, 517), 4:15 p. m.,** musical program; 6, dinner concert; 7, musical program.  
**WDAF, Kansas City, Mo. (Central, 411), 3:30-4:30 p. m.,** the Star's Radio trio; 6-7, school of the air, piano tuning in number on the Duo-Art; travelogue, Edgar Allen Linton, writer and lecturer; readings, Miss Cecile Burton; the Tell-Me-a-Story lady; music, Carl Nordberg's Plantation players, Hotel Muehlebach; 11:45-1 a. m., night-hawk frolic, the "Merry Old Chief" and the Plantation players, Hotel Muehlebach.  
**WDAF, Philadelphia, Pa. (Eastern, Daylight, 395), 11:45 a. m.,** daily almanac; 12:02 p. m., Stanley theater organ recital; 12:30, Arcadia cafe concert orchestra; 2, Arcadia cafe concert orchestra; talk, Mrs. Anna B. Scott; 4:30, "Magazine Corner"; 7:30, Dream Daddy's bedtime stories.  
**WEAF, New York, N. Y. (Eastern, Daylight, 492), 11-11:15 a. m.,** Mabel Emile, soprano; 11:15-11:45, talks to housewives; 4-4:15 p. m., Carl Leggett, baritone; 1:15-1:30, Marion Cora, soprano; 4:30-5, children's stories; 6-7, dinner music, Waldorf-Astoria hotel; 7-7:30, Federation of churches; 7:45-8, Ada Gordon, pianist; 8:30-8:45, Emily A. Berry, dramatic reader; 8:45-9, Oswald Olsen, bass; 9:15-9:30, West End Ladies' trio; 10-11, Vincent Lopez and his Hotel Pennsylvania orchestra.  
**WEAD, Columbus, Ohio (Eastern, 360), 1:30 p. m.,** educational lecture, member Ohio State university faculty; 8, lecture; instrumental program.  
**WFAA, Dallas, Tex. (Central, 476), 12:30-1 p. m.,** address; 3:30-9:30, musical recital presenting Emmett B. Peck, violinist and assisting artists; 11-12, Mustangs' orchestra in popular music recital.  
**WFI, Philadelphia, Pa. (Eastern, Daylight, 395), 1 p. m.,** Meyer Davis Bellevue Stratford concert orchestra; 3, closing prices, Chicago grain market; 3:05, Loretta Kerk, pianist; 6, Sunny Jim, the Kiddies' pal; 6:30, Meyer Davis Bellevue Stratford concert orchestra; 8, Boy Scouts Radio corps, direction Delaware and Montgomery County councils, Boy Scouts of America.  
**WGN, Chicago, Ill. (Central, Daylight, 370), 6:30-7:30 p. m.,** Drake concert ensemble and Blackstone string quintet; 8:30-9:30, Mary Brown, Otto Moore, Agnes McLoughlin; 10:30-11:30, Bert Davis, Jack Chapman's orchestra.  
**WGR, Buffalo, N. Y. (Eastern, Daylight, 319), 12:30-1 p. m.,** George Albert Bouehard, organist; 6:30-7:30, dinner music.  
**WGY, Schenectady, N. Y. (Eastern, 380), 1 p. m.,** music and fashion talk; 5:30, organ recital by Stephen E. Botschall, organist; one-act plays by WGY student players, selection, "Melodie," orchestra.  
**WHAS, Louisville, Ky. (Central, 400), 4-5 p. m.,** selections by Dick Quinlan's Gold Derby orchestra; 7:30-9, concert under the auspices of Mrs. John E. Harmon, Jr., of New Albany, Ind.  
**WHB, Kansas City, Mo. (Central, 411), 8-9:30 p. m.,** studio recital; WHB artists; 10:30-11:30, dance program; Frank R. Marks' orchestra, Indian Village.  
**WHK, Cleveland, Ohio (Eastern, 283), 8 p. m.,** program arranged by the Cleveland Press; solo numbers by popular artists; 9, dance program, Euclid Gardens, Garber Davys orchestra.  
**WHN, New York, N. Y. (Eastern, Daylight, 360), 2:15-3:15 p. m.,** Bob Schaefer and his entertainers, assisted by Harry Fein's orchestra; 4-4:30, Genevieve Williams, soprano, Sam Steinberg, violinist, Chas. Strickland, pianist; 4:45-5, "Tea Time Talk," Loretta C. Lynch, 5-5:30, Leonard Partridge's Mayflower orchestra; 6:30-7:30, Olcott Vail's trio and Paul Specht's Alamae orchestra; 9:30-10, Chas. Strickland's Palisades Park orchestra; 10:30-11, Roseland dance orchestra.  
**WHO, Des Moines, Ia. (Central, 526), 7:30-9 p. m.,** musical program, male quartet; Mrs. Mike Gillcrist, piano; Alice Eddy, soprano; Paul Coswell, whistler; Robt. Barr, violin; E. F. Killinger, baritone.  
**WIP, Philadelphia, Pa. (Eastern, Daylight, 509), 10 a. m.,** seashore gossip; 10:10, Bernard MacFadden's health talks; 3 p. m., "What the wild waves are saying"; 8:30, Comfort's Philharmonic orchestra; 8:05, Kentucky Serenaders' dance orchestra; 7, Uncle Wip's bedtime stories; 8, "Timely Talks to Motorists"; Gene Heagle, secretary Automobile club of Phila.; 8:15, Comfort's Philharmonic orchestra; 8:45, "What the wild waves are saying"; 8:50, Murphy's minstrels, direction Frank Elliott; 9:30, Vessella's concert band; 10, Bob Leaman's dance orchestra.  
**WJAX, Cleveland, Ohio (Eastern, 390), 8 p. m.,** Hotel Cleveland orchestra, Ivan Francis, director; Kathryn Mulhally, pianist; Hollibaugh Midnight Serenaders of Alliance, Ohio, O. M. Hollibaugh, director.  
**WJY, New York, N. Y. (Eastern, Daylight, 405), 7:30 p. m.,** weekly French lesson; 8, pianist and tenor; 9, "The Rhythm Club" orchestra.  
**WJZ, New York, N. Y. (Eastern, Daylight, 445), 7:55 a. m.,** 8, Wall Street Journal review; 8:30,

Wanamaker organ concert; 9:15, description of the Wills-Firpo boxing match; 10:30, Waldorf-Astoria dance orchestra.  
**WLS, Chicago, Ill. (Central, Daylight, 345), 6:30 p. m.,** Ralph Emerson at the Barton organ; 6:45, Glenn Rowell and Ford Rush; 6:50, Ralph Emerson at the Barton organ; 7:05, Isham Jones' orchestra; 7:20, The Harmony girls; 7:35, Isham Jones; 7:45, lullaby time; 10:15, Dave and Dorothy Grant, duet; 10:30, orchestra; 10:40, Glenn Rowell and Ford Rush time; 11, Isham Jones' orchestra; 11:10, Arnold Kipp, Scotch artist; 11:30, orchestra; 11:45, "The Dixie Stars"; 12, Ralph Emerson at the Barton organ, request program.  
**WLW, Cincinnati, Ohio (Central, Daylight, 423), 10 p. m.,** popular music, Doherty Melody orchestra; dialogue, "After the Storm," J. E. and Marion Klein; 10:30, Milnor instrumental trio; 11, songs, "When Evening Shadows Fall," Ray Rutledge, first tenor; Lincoln Newhall, second tenor; Al. Kreuzman, first bass; Fred Muething, second bass.  
**WMAQ, Chicago, Ill. (Central, Daylight, 447.5), 4:30 p. m.,** musical program; Chicago theater organ; 6:30, Hotel LaSalle orchestra; 8, to be announced; 9, Melan Lusk, violinist.  
**WMC, Memphis, Tenn. (Central, 500), 8:30 p. m.,** program by the Hotel Chisca orchestra.  
**WMH, Cincinnati, Ohio (Central, Daylight, 309), 7:45 p. m.,** fairy tales, Nicholas Klein; 8, tabloid musical program; 9, Avon dance orchestra, R. C. Fisher, director.  
**WNYC, New York, N. Y. (Eastern, Daylight, 526), 7:30-7:35 p. m.,** Police Alarms; 7:35-7:45, health talk; 8:15-10, concert from Central Park; 10:30-10:45, Police Alarms; 11-11:15, official weather forecast.  
**WOAW, Omaha, Neb. (Central, 526), 6 p. m.,** popular half hour; 6:25, dinner concert; 9, de luxe program by G. R. Radio orchestra.  
**WOC, Davenport, Ia. (Central, 484), 9 p. m.,** musical program, the Palmer School Radio orchestra.  
**WOO, Philadelphia, Pa. (Eastern, Daylight, 509), 11 a. m.,** Mary E. Vogt, organist; 12:02 p. m., Wanamaker crystal tea room orchestra, Robert E. Golden, director; 4:45, Mary E. Vogt, organist.  
**WOR, Newark, N. J. (Eastern, Daylight, 405), 2:30-2:45 p. m.,** Lou Lancaster, soprano; 2:45-3, Sophia Kornikoff, pianist; 3:30-3:45, Louise Lancaster; 3:55-4:15, Sophia Kornikoff; 6:15-6:30, "Radio for the Layman," Albert E. Sonn; 6:30-7:30, "Music While You Dine," Tom Cooper's Country Club orchestra; 7:20-7:30, resume of day's sports, Jolly Bill Steinke.  
**WOS, Jefferson City, Mo. (Central, 440.9), 8 p. m.,** address; 8:20, musical program given under the sponsorship of William A. Lantz, old time fiddler of Englewood, Missouri.  
**WQJ, Chicago, Ill. (Central, Daylight, 447.5), 11-12 a. m.,** home economics program; 3-4 p. m., special program; 7-8, dinner concert by Ralph Williams and his Rainbo Garden orchestra; Mrs. Lydia Lochner, contralto, Marion Henry accompanist; Dorothy Davie Dixon, soprano; Kathryn Snyder, reader; 10-2 a. m., Ralph Williams and his Rainbo Garden orchestra; Grace Wilson, contralto; Axel Christensen, pianoforte; Hill, Hirsch and Gorny, harmony singers; Bernard and Robinson, the Dixie Stars, Lew Butler singing "Go Long, Mule."  
**WRC, Washington, D. C. (Eastern, Daylight, 469), 6 p. m.,** children's hour by Peggy Albion; 8:20, to be announced; 8:45, talk on motoring.  
**WSB, Atlanta, Ga. (Central, 429), 12 m.,** entertainment; 2:30 p. m., baseball scores, Miss Bonnie Barnhardt's bedtime story; 9, report of the Firpo-Wills Boxing bout.  
**WTAS, Elgin, Ill. (Central, 286), 12:30-1:30 p. m.,** Morrison hotel Terrace Garden noonday orchestral concert, Benson's Victor orchestra; 2-5, baseball scores; 6:30-12, star concert dance program from Morrison hotel Terrace Garden restaurant; selections by Charley Huzhey, official pianist, Charles Harrison, Benson's Victor orchestra.  
**WWJ, Detroit, Mich. (Eastern, 517), 9:30 a. m.,** talk, Womersley's editor, Detroit News; 12 m., Detroit News orchestra; 8:30 p. m., Detroit News orchestra; 10, Goldkette's orchestra; 11, Detroit News orchestra.

## Friday, September 12

**CKAC, Montreal, Can. (Eastern, Daylight, 425), 1:45 p. m.,** Mount Royal hotel luncheon concert.  
**CNRT, Toronto, Can. (Eastern, 400), 8 p. m.,** vocal numbers, The Village choir; "Canadian Business Conditions," Graham F. Towers; humorous sketches, Blume and Gardner.  
**KDKA, East Pittsburgh, Pa. (Eastern, 328), 11:15 a. m.,** concert by Daugherty's orchestra, from McCreezy's dining room, Pittsburgh; 5:30, organ recital by Paul E. Fleeger, from the Cameo Motion Picture theater, Pittsburgh; 6:30, children's period, the Poetry lady; 7:15, feature; 7:30, address; 8, concert arranged by Chauncey Parsons, courtesy Rosenbaum company.  
**KFI, Los Angeles, Calif. (Pacific, 469), 6:35-8 p. m.,** Aeolian organ recital; 8-9, Evelyn Herald, Marion Ward players; 9-10, studio program; 10-11, Tyrolan Zither club; 11-12, Ambassador hotel Coconut Grove orchestra.  
**KFNF, Shenandoah, Ia. (Central, 260), 7:30 p. m.,** concert, Henry Field, local company.  
**KFOA, Seattle, Wash. (Pacific, 455), 8:30 p. m.,** Rhodes Department Store night.  
**KFSG, Los Angeles, Calif. (Pacific, 278), 3:30-4:30 p. m.,** organ recital, courtesy, Roy Reid Briznall; 7:30-9:15, crusaders' meeting, chorus; address, Judge Carlos S. Hardy; sermon, Allice Semple McPherson; 9:15-10, Gray studio program; 10-11, organ recital, courtesy, R. Barnett Ballard.  
**KGO, Oakland, Calif. (Pacific, 312), 3 p. m.,** studio



Wilda Wilson Church (left) as she looks on while the Doherty Melody Boys ready to play music at WLW. A. G. Rudd (right), the international polo games from WLW.

musical program; 4-5:30, concert orchestra of the Hotel St. Francis.  
**KGW, Portland, Ore. (Pacific, 492), 3:30 p. m.,** woman's program; 8:15, studio program by George Olsen's Metropolitan orchestra of the Hotel Portland; Herman Kemm, director; 10:30, Hoot, Owl, Hoot.  
**KHJ, Los Angeles, Calif. (Pacific, 395), 12:00-1:15 p. m.,** concert; 6-6:30, Art Hickman's concert orchestra, direction, Edward Fitzpatrick; 6:30-7:30, children's hour, Richard Hedrick, screen juvenile; 8-9:30, concert, courtesy, Southern California Radio corporation; 9:30-10, U. S. Naval Reserve band, courtesy, L. A. Park department; 10-11, Art Hickman's dance orchestra.  
**KLX, Oakland, Calif. (Pacific, 509), 8-10:20 p. m.,** program, Daisy O'Brien, director; Marjorie S. Stoner, vocalist; Julia H. Cochran, violinist; American Theater orchestra; Harold Perry, vocalist; songs, Mabel Serey Keeney; "The Veterans of Foreign Wars," Eugene K. Sturgis.  
**KPO, San Francisco, Calif. (Pacific, 423), 1-2 p. m.,** Rudy Seiger's orchestra; 2:30-3:30, organ recital; 4:30-5:30, Fairmont hotel orchestra.  
**KQW, Pittsburgh, Pa. (Eastern, Daylight, 270), 10:30-11 a. m.,** music; 4-4:30 p. m., music; 9-10, musical program presented by trio of Washington, Pa. artists.  
**KSD, St. Louis, Mo. (Central, 516), 8:15 p. m.,** broadcast, National Defense Test Day direct from Washington, D. C.  
**KYW, Chicago, Ill. (Central, Daylight, 536), 6:45 p. m.,** bedtime story; 7-7:30, dinner concert; 7:30-8, program; 8:20-8:45, speeches; 9-10:30, midnight review; 10:30-10:45, stage reviews; 10:45-12:30 a. m., continuation of midnight review.  
**WBAV, Columbus, Ohio (Eastern, 423), 12 m.,** Ila Lorbach Owens, pianist; 8 p. m., concert, Dispatch Little Symphony orchestra, John E. Clarke, director.  
**WBZ, Springfield, Mass. (Eastern, Daylight, 337), 6 p. m.,** dinner concert; 7:10, talk; 7:30, bedtime story; 11, concert, St. Paul's Episcopal church choir.  
**WCAE, Pittsburgh, Pa. (Eastern, Daylight, 462), 6:30 p. m.,** dinner concert, William Penn hotel; 8, popular songs, Ben Fields; 9:30, musical program.  
**WCAP, Washington, D. C. (Eastern, 469), 8-8:30 p. m.,** music; 8:30-8:45, "Foreign Affairs," Captain Gordon Gordon-Smith; 8:45-10, musicale.  
**WDX, Detroit, Mich. (Eastern, 517), 4:15 p. m.,** musical program; 6, dinner concert; 7, musical program.  
**WDAF, Kansas City, Mo. (Central, 411), 3:30-4:30 p. m.,** the Star's string trio; 6-7, school of the air, piano tuning in number on the Duo-Art; nineteenth of a series of piano lessons, Miss Maudellen Littlefield; address, speaker from the Kansas City Children's bureau; the Tell-Me-a-Story lady; music, Carl Nordberg's Plantation players, Hotel Muehlebach; 8-9, the Star's Radio orchestra with the WDAF minstrels; 11:45-1 a. m., night-hawk frolic, the "Merry Old Chief" and Charles Domberger's orchestra, K. C. A. roof garden; the Plantation players, Hotel Muehlebach.  
**WDAR, Philadelphia, Pa. (Eastern, Daylight, 395), 11:45 a. m.,** daily almanac; 12:02 p. m., Stanley theater organ recital; 12:30, Arcadia cafe concert orchestra; 2, Arcadia cafe concert orchestra; 7:30, Fry's Million Dollar Pier, Benson's Chicago and Arcadia cafe dance orchestra; 8:30, Emmett Welsh's minstrel; 9:15, fishing forecast, Captain John Young; 10, Fry's Million Dollar Pier, Benson's Chicago and Arcadia cafe dance orchestra; 12, "Morning Glory Club" program.  
**WEAF, New York, N. Y. (Eastern, Daylight, 492), 11-11:15 a. m.,** talk, Leonard Barroa, Garden Magazine; 4-4:15, club program for women; 4:45-5, John Burnham, pianist; 6-7, dinner music, Waldorf-Astoria hotel; 7-7:30, children's stories; G. R. Kinney Show company; 7:45-8, Jos. White, tenor; 8-8:15, Harry Jentes, pianist; 8:30-8:45, Rosella Shelner, ten-year-old violinist; 9-10, B. Fischer & Co.; "Astor Coffee" dance orchestra.  
**WEAO, Columbus, Ohio (Eastern, 360), 1:30 p. m.,** educational lecture, member Ohio State university faculty; 4, farm talk, faculty member; music, university artists.  
**WFAA, Dallas, Tex. (Central, 476), 12:30-1 p. m.,** program by American Legion, Capt. O. B. Freeman, Commander; John W. Law Post; 8:15-9, concert, Coolidge and other speakers at Defense Day exercises in Washington; 9-9:30, exercises of Defense Day.  
**WFI, Philadelphia, Pa. (Eastern, Daylight, 395), 1 p. m.,** Meyer Davis Bellevue Stratford concert orchestra; 3, closing prices, Chicago grain market; 3:05, Caroline Hoffman, pianist; 6, Sunny Jim, the Kiddies' pal; 6:30, Meyer Davis Bellevue Stratford concert orchestra.  
**WGN, Chicago, Ill. (Central, Daylight, 370), 6:30-7:30 p. m.,** Drake concert ensemble and Blackstone string quintet; 8:30-9:30, patriotic program for Defense Day; Salvation Army band; 10:30-11:30, Bert Davis, Jack Chapman's orchestra.  
**WGR, Buffalo, N. Y. (Eastern, Daylight, 319), 12:30-1 p. m.,** George Albert Bouehard, organist; 6:30-7:30, dinner music; 9-10:15, National Defense Day program; 11:30, supper dance music, Vincent Lopez, Hotel Statler dance orchestra, Harold Giesler, director.  
**WGY, Schenectady, N. Y. (Eastern, 380), 1 p. m.,** music and household hints; 5:30, stories for children; 7:15, health talk; 7:50, program by WGY orchestra; 10:30, program by WGY orchestra.  
**WHAS, Louisville, Ky. (Central, 400), 4-5 p. m.,** selections by the Alamo theater orchestra; 7:30-9, concert under the auspices of John O. Harple.  
**WHB, Kansas City, Mo. (Central, 411), 7-8 p. m.,** weekly talk, representative of the W. C. T. U.; music, Sweeney instrumental trio.  
**WHK, Cleveland, Ohio (Eastern, 283), 8 p. m.,** Hotel

Winton Carnival program; Austin J. Wylie's Golden Pheasant orchestra; popular number by favorite entertainers.  
**WHN, New York, N. Y. (Eastern, Daylight, 360), 2:15-2:30 p. m.,** Gene Austin, baritone; 3:15-4, Uncle Robert's chat with children; 4-4:15, Mabel Livingston, poet; 4:45-5, Wm. J. Stuart, author of Candle Light Philosophy; 6:30-7:30, Olcott Vail's trio and Paul Specht's Alamae orchestra; 9:30-10, Crystal Palace orchestra; 10-10:30, Gem Safety Razor orchestra; 10:30-11, Roseland dance orchestra; 11:30-12, Club Alabam review.  
**WKAQ, San Juan, Porto Rico, (Central, 360), 6-8 p. m.,** studio program.  
**WIP, Philadelphia, Pa. (Eastern, Daylight, 509), 10 a. m.,** seashore gossip; 10:10, Bernard MacFadden's health talks; 3 p. m., "What the wild waves are saying"; 8:30, Comfort's Philharmonic orchestra; 8:05, Eddie Elkins' dance orchestra; 7, Uncle Wip's bedtime stories.  
**WJY, New York, N. Y. (Eastern, Daylight, 405), 7:30 p. m.,** Leonard Nelson's Knickerbocker grill orchestra; 8:15, Time Pop question game; 9:30, orchestra.  
**WJZ, New York, N. Y. (Eastern, Daylight, 455), 1 p. m.,** Hotel Ambassador trio; 4:15, arts and decorations talk; 4:30, Hotel Astor organ recital; 7, Lafayette hotel orchestra; 8:30, talk; 10:30, Harold Stern's Ballchair Towers orchestra.  
**WLS, Chicago, Ill. (Central, Daylight, 345), 6:30 p. m.,** Ralph Emerson; 6:45, Glenn Rowell and Ford Rush; 6:50, Ralph Emerson; 7:05, Isham Jones' orchestra; 7:20, The Harmony girls; 7:45, lullaby time; 8, orchestra; 8:15, monologist and singer; 9-10, farm program; 10, Radio drama; 10:30, orchestra; 10:40, Glenn and Ford time.  
**WLW, Cincinnati, Ohio (Central, Daylight, 423), 4 p. m.,** piano recital by pupils of Stolferen studio.  
**WMAQ, Chicago, Ill. (Central, Daylight, 447.5), 4:30 p. m.,** musical program; 6, Chicago theater organ; 6:30, Hotel LaSalle orchestra; 8, talk; 9:15, to be announced.  
**WMC, Memphis, Tenn. (Central, 500), 8:30 p. m.,** Britling's Cafeteria Novelty orchestra; 11, midnight frolic by Bob Miller's Steamer Idlewild orchestra.  
**WNYC, New York, N. Y. (Eastern, Daylight, 526), 7:30-7:45 p. m.,** Police Alarms; 8:15-10, concert from Central Park; 10:30-10:45, Police Alarms; 11-11:15, official weather forecast; 11:45-12, Nat Martin's orchestra.  
**WOAW, Omaha, Neb. (Central, 526), 6 p. m.,** story hour; 6:30, dinner program; 9, program by Minsner's Merry Minstrels of Minster School of Spoken Word.  
**WOC, Davenport, Ia. (Central, 484), 8 p. m.,** musical program; 9, talk.  
**WOO, Philadelphia, Pa. (Eastern, Daylight, 509), 11 a. m.,** Mary E. Vogt, organist; 12:02 p. m., Wanamaker crystal tea room orchestra, Robert E. Golden, director; 4:45, Mary E. Vogt, organist; 7:30, A. Candelori and his Hotel Adelphia roof garden concert orchestra; 8:30, Harriet G. Ripley, pianist; 10, Hotel Adelphia dance orchestra, direction A. Candelori.  
**WOR, Newark, N. J. (Eastern, Daylight, 405), 2:30-4 p. m.,** Defense Day program; 6:15-6:30, Lou Strassman and his Four Towers orchestra; 6:30-6:45, man in the moon stories for children; 7-7:15, Lou Strassman and his Four Towers orchestra; 7:20-7:30, resume of day's sports, Jolly Bill Steinke.  
**WQJ, Chicago, Ill. (Central, Daylight, 447.5), 11-12 a. m.,** home economics program, Fred Mann and his Sunday dinner menus; Marla Meadows, "Your children's clothes"; 3-4 p. m., talks; special musical program; 7-8, dinner concert by Ralph Williams and his Rainbo Garden orchestra; talk; soprano; tenor; 10-2 a. m., Ralph Williams and his Rainbo Garden orchestra; tenor; O'Flannigan and O'Hara; impersonator; London brothers, duet; Ned Miller, tenor.  
**WRC, Washington, D. C. (Eastern, Daylight, 469), 3 p. m.,** fashion developments; 3:10, song recital; 3:20, beauty and personality talk; 3:25, current topics; 3:30, the Magazine of Wall street; 4, song recital; 6, children's stories.  
**WSB, Atlanta, Ga. (Central, 429), 12 m.,** entertainment; 3 p. m., relay of outdoor celebration at Piedmont Park on National Defense Day; 8, relay of messages by President Coolidge, General Pershing and others from Washington; 10:45, Georgia Railway and Power company quartet.  
**WTAS, Elgin, Ill. (Central, 286), 12:30-1:30 p. m.,** special Friday noon Kimball Hall concert, Eddie and Fanny Cavanaugh; 2-5, baseball scores; 6:30-12, star



# COLLIDGE AND PERSHING FRIDAY

the KGO Players in Oakland. Below regular Thursday evening of fun and the U. S. Army, is broadcasting the again September 10 and 13.



## Where to Hear Talks

TALKS, instructive, serious, humorous and even frivolous, are Radiocast daily and below are listed the stations.

- Wednesday:** CKCH, KDKA, KFOA, KGO, KHJ, KYW, WBBR, WCX, WDAF, WDAW, WDAF, WGI, WHA, WIP, WJZ, WLS, WMAQ, WOR, WOS.
- Thursday:** CKAC, KDKA, KFSG, KHJ, KYW, WBBR, WBZ, WCAE, WDAF, WDAW, WGI, WGY, WHAS, WHB, WHN, WIP, WJAX, WJZ, WLS, WLW, WMAQ, WOR, WQJ, WRC.
- Friday:** CKY, CNRT, KFSG, KYW, WBAV, WBZ, WDAF, WDAW, WDAF, WGI, WJZ, WLS, WMAQ, WOR, WQJ, WRC.
- WGI, WGY, WHB, WJZ, WLS, WMAQ, WOAW, WOS, WRC.**
- Saturday:** CNRO, KDKA, KFSG, PWX, WBBR, WDAF, WFI, WGI, WJZ, WRC.
- Monday:** KGO, WBBR, WBZ, WDAF, WDAW, WFAA, WGR, WGY, WHN, WOR, WOS, WQJ.
- Tuesday:** KFSG, KYW, WCAE, WDAF, WDAW, WFAA, WGI, WGY, WHAA, WHAS, WJY, WJZ, WLAG, WMAQ, WQJ, WRC.

Poerterdale string quintet; 10:45, week-end jubilee. WTAM, Cleveland, Ohio (Eastern, 390), 9 p. m., WTAM dance orchestra, Ev Jones, director; solo numbers by popular entertainers; Johnnie Gribben, accordion solos.

WTAS, Elgin, Ill. (Central, 286), 12:30-1:30 p. m., Morrison Hotel Terrace Garden noonday orchestral concert; Benson's Victor orchestra; 2-5, baseball scores 6:30-12, star concert dance program from the Morrison Hotel Terrace Garden restaurant; piano selections by Charley Hughey.

WJL, Detroit, Mich. (Eastern, 517), 9:30 a. m., women's editor, Detroit News; 12 m., Detroit News orchestra.

KGO, Oakland, Calif. (Pacific, 312), 3 p. m., studio musical program; 4-5:30, Henry Halstead's dance orchestra; 5:30-6:30, Kiddies' Club; 8, educational program; 10-11 a. m., dance music.

KGW, Portland, Ore. (Pacific, 492), 3:30 p. m., literary program, Portland Library association; 8, concert.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Stanleys Celler cafe Hawaiian trio.

KQV, Pittsburgh, Pa. (Eastern, Daylight, 270), 10:30-11 a. m., music; 3-3:30 p. m., music; 8-9, popular song revue presented by Ben and Thelma Fields; 9-10, musical program.

WBAY, Columbus, Ohio (Eastern, 423), 12 m., Ila Lorbach Owens, pianist.

WCX, Detroit, Mich. (Eastern, 517), 4:15 p. m., musical program; 6, dinner concert; 8:30, musical program.

WOAF, Kansas City, Mo. (Central, 411), 3:30-4:30 p. m., the Star's Radio trio; 5-5:30, Boy Scouts program; 6-7, school of the air, music; 8-9:30, program by the Ivanhoe Masonic band; 11:45-1 a. m., night-hawk frolic.

WOAR, Philadelphia, Pa. (Eastern, Daylight, 395), 11:45 a. m., daily almanac; 12:02 p. m., Stanley theater organ recital; 12:30, Arcadia cafe concert orchestra; 2, Arcadia cafe concert orchestra; Edna Finestone, pianist; 4:30, talk, Mrs. Louis Love; 7:30, Dream Daddy's bedtime stories; 7:50, movie review, James A. Nassau; 8, Arcadia cafe concert orchestra; 9:10, Stanley theater symphony orchestra; 10, Arcadia cafe dance orchestra.

WEAF, New York, N. Y. (Eastern, Daylight, 492), 6-7 p. m., dinner music, Waldorf-Astoria hotel; 7-7:25, Wardman Park Trio; 8-8:15, Ansonia Clock concert; 8:30-10, Marine Band, Washington, D. C.; 10-10:15, Frederick J. Haskin.

WEAO, Columbus, Ohio (Eastern, 360), 1:30 p. m., educational lecture, member Ohio State university faculty.

WFI, Philadelphia, Pa. (Eastern, Daylight, 395), 1 p. m., Meyer Davis Bellevue Stratford concert orchestra; 3, Loretta Kerk, pianist; Harold Simonds, baritone; 6, Sunny Jim, the kiddies' pal; 6:30, Meyer Davis Bellevue Stratford concert orchestra.

WGR, Buffalo, N. Y. (Eastern, Daylight, 319), 12:30-1 p. m., George Albert Bouchard, organist.

WGY, Schenectady, N. Y. (Eastern, 380), 9:30 p. m., dance music by Joseph A. Chickene and his New York City orchestra of Hotel Ten Eyck, Albany, N. Y.; popular songs by Frank Davis.

WHAS, Louisville, Ky. (Central, 400), 4-5 p. m., selections by Dick Kynlian's Gold Derby orchestra; 7:30-9, concert by the Sylvian trio.

WHN, New York, N. Y. (Eastern, Daylight, 360), 2:15-2:30 p. m., Henry Coert and Chas. First, songwriters; 2:30-2:45, Joe Kelly, tenor; 2:45-3:00, Tom Banks and his orchestra; 3:45-5:15, Ellen Montague Cross Concert company; 4:15-4:45, Alex Aranosy, violinist; Stephen Kautz, pianist; 4:45-5, Kenneth Moltz, tenor; 5-5:30, Bert Reith's Southern harmonists; 6:30-7:30, Olcott Vail's Trio and Paul Specht's Almac orchestra; 8-8:15, Ida Nachmanowitz, pianist; 8:15-8:30, Augusta Strangfeld, soprano; 8:30-8:45, boy's period, Wm. J. Stuart; 8:45-9, Perfect Harmony Four Male Quartet; 9-9:15, Arthur Stone, blind pianist; 9:15-9:30, J. Emmett Kelly, tenor; 9:45-10, Fitzpatrick Brothers; 10-10:30, Melody Four Male Quartet; 10:30-10:45, Pergola Brothers, banjo and accordion; 10:45-11, Wright and Bessinger; 11-11:30, Jimmy Clarke and his entertainers; 11:30-12, Roseland dance orchestra.

WIP, Philadelphia, Pa. (Eastern, Daylight, 509), 10 a. m., seashore gossip; 10:10, Bernarr MacFadden's health talks; 1 p. m., Karl Bonawitz, organist; 3, What the wild waves are saying; 3:30, Comfort's Philharmonic orchestra; 6:05, Kentucky Serenaders dance orchestra; 7, Uncle Wip's bedtime stories; 8, Comfort's Philharmonic orchestra; 8:50, Yessella's concert band; 10, Bob Leman's dance orchestra; 11, Karl Bonawitz, organist.

WJZ, New York, N. Y. (Eastern, Daylight, 455), 1 p. m., Hotel Vanderbilt orchestra; 7, Waldorf-Astoria dance orchestra; 9:30, concert orchestra of S. S. Francke; 10:30, Hotel Astor dance orchestra.

WLS, Chicago, Ill. (Central, Daylight, 345), 7:45 p. m., lullaby time; 8-1 a. m., National barn dance; Ralph Emerson, at Barton organ.

WMAQ, Chicago, Ill. (Central, Daylight, 447.5), 6:30 p. m., Hotel LaSalle orchestra; 8, Chicago quartette; 9, weekly Lalaban & Katz Chicago theater revue.

WMC, Memphis, Tenn. (Central, 500), 8:30 p. m., program by Philharmonic orchestra.

WNCN, Cincinnati, Ohio (Central, Daylight, 309), 10 p. m., special musical program; 11, Eddie Sides's Middle orchestra.

WNYC, New York, N. Y. (Eastern, Daylight, 526), 7:30-7:45 p. m., Police Alarms; 8:15-8:30, concert from Central Park; 10:30-10:45, Police Alarms; 11-11:15, official weather forecast.

WDAW, Omaha, Nebr. (Central, 526), 6 p. m., address; 6:30, dinner program; 9, program from vocal studio of Walter B. Graham, baritone, Regina Franklin, accompanist.

WDC, Davenport, Ia. (Central, 484), 9 p. m., orchestra program; Ralph W. Fuller, baritone soloist.

WDO, Philadelphia, Pa. (Eastern, Daylight, 509), 11 a. m., Mary E. Vogt, organist; 12:02 p. m., Wanamaker crystal tea room orchestra, Robert E. Golden, director; 4:45, Mary E. Vogt, organist; Wanamaker band.

WDR, Newark, N. J. (Eastern, Daylight, 405), 2:30-2:45 p. m., Florence Fromuelt, contralto; 2:45-3, Ray Goldberg, pianist; 3:30-3:45, Florence Fromuelt; 3:45-4, Ray Goldberg; 6:15-7, "Music While You Dine"; Charley Storm and his Collegians; 7:15-7:20, resume of days sports; 8-8:15, Mrs. John W. Anderson, soprano; Ethel Arizchi, pianist; 8:15-8:30, "How Adrenalin Gets Around"; Gilbert P. Farrar, lecturer; 8:30-8:45, Herman Gelhausen, baritone; 9:15-9:30, Mrs. John W. Anderson, soprano; 9:30-9:45, Julius Koehl, pianist; 9:45-10, Herman Gelhausen, baritone; 10-10:15, Julius Koehl; 10:15-11, Manhattan Screamers.

WQL, Chicago, Ill. (Central, Daylight, 447.5), 11-12 a. m., home economics program; talks; 3-4 p. m., "Koffee" Klatsch; special musical program; 7-8, Grace Nelson, 14-year-old pianist; Joe Garrity, Irish tenor; 10-2 a. m., Ralph Williams' orchestra; songs.

WRC, Washington, O. C. (Eastern, Daylight, 469), 7:45 p. m., bible talk; 8, song recital; 8:15, piano recital; 8:30, some recital; 9, to be announced.

WSAI, Cincinnati, Ohio (Central, Daylight, 309), 8 p. m., chimes concert; 8:30, special musical program; 9, weekly news review, Lutherford H. Cox; novel entertainment features.

WSB, Atlanta, Ga. (Central, 429), 12 m., entertainment; 3:30 p. m., baseball scores; 6, bedtime story; 8-9,

## Sunday, September 14

CHYC, Montreal, Can. (Eastern, 341), 9 p. m., studio program.

KFNH, Shenandoah, Ia. (Central, 266), 3 p. m., religious services, Columbia community church; 6:30, regular sacred song service.

KFSG, Los Angeles, Calif. (Pacific, 278), 10:30-12:30 noon, morning service, sermon, Aimee Semple McPherson; Esther F. Green, organist; 2:30-4:30 p. m., evangelistic sermon, Aimee Semple McPherson; choir; silver band, direction Gladwyn N. Nichols; 7-9:30, choir; silver band; Esther Green, organist; salvation sermon, Aimee Semple McPherson.

KGO, Oakland, Calif. (Pacific, 312), 3:30 p. m., concert by KGO Little Symphony orchestra; 7:30, evening service.

KGW, Portland, Ore. (Pacific, 492), 6 p. m., church services.

KHJ, Los Angeles, Calif. (Pacific, 395), 10 a. m., sermon in KHFJ studio; 10:30-12:30 noon, organ recital and service from First M. E. church, Arthur Blakeley, organist; Rev. E. E. Helms, pastor; 6:30-7 p. m., Art Hickman's concert orchestra, direction, Edward Fitzpatrick; 7-7:30, organ recital from First M. E. church, Arthur Blakeley, organist; 8-10, de luxe concert.

KYW, Chicago, Ill. (Central, Daylight, 536), 11 a. m., Sunday morning service; 2:30 p. m., studio chapel service.

WCM, Detroit, Mich. (Eastern, 517), 7:45 p. m., services, Central M. E. church, Dr. Lynn Harold Hough; Hudson quartets.

WDAF, Kansas City, Mo. (Central, 411), 4-5 p. m., program broadcast from the Newman theater.

WDAW, Philadelphia, Pa. (Eastern, Daylight, 395), 2:30 p. m., Arcadia cafe concert orchestra.

WF, New York, N. Y. (Eastern, Daylight, 492), 7:20-9:15 p. m., Capitol theater; 9:15-10:15, Skinner organ recital.

WFI, Philadelphia, Pa. (Eastern, Daylight, 395), 7:30 p. m., services, Arch Street Presbyterian church, Rev. C. A. Macartney, minister.

WGN, Chicago, Ill. (Central, Daylight, 370), 5-6 p. m., program announced later; 9:15, Indiana male quartet; 9:45, concert symphony.

WGR, Buffalo, N. Y. (Eastern, Daylight, 319), 4 p. m., vesper service.

WGY, Schenectady, N. Y. (Eastern, 380), 10 a. m., St. Peters Episcopal church; 3 p. m., St. Peters Episcopal church, Rev. Charles E. Harriman.

WHAS, Louisville, Ky. (Central, 400), 10 a. m., church services, song; 4-5, concert.

WHB, Kansas City, Mo. (Central, 411), 11 a. m.-12:30 p. m., services, Linwood Boulevard Christian church, Dr. Burris Jenkins, pastor; 8-9:30, services, representative churches of Kansas City, broadcast from Indian Village.

WHK, Cleveland, Ohio (Eastern, 283), 8 p. m., program arranged by Hotel Winton; chapel service, auspices Cleveland Federated churches; Rev. E. T. Wright, church religious topics; Lakewood Presbyterian church choir; Men's Bible class, orchestra; 9, O. A. Bryan, Leonard Z. Bryan, Jr., Mary E. Black, number music; 10, orchestra.

WHO, Des Moines, Ia. (Central, 526), 7:30-9 p. m., musical program given by the Bankers Life Radio orchestra, Mr. Wm. Marsh and Stewart Dulaney, directors; banjo soloist; saxophone soloist.

WIP, Philadelphia, Pa. (Eastern, Daylight, 509), 3:35 p. m., Comfort's Philharmonic orchestra; 7:30, services, Holy Trinity chapel; 9:30, special Sunday evening concert, Steel Pier, Atlantic City.

WLS, Chicago, Ill. (Central, Daylight, 345), 6:30 p. m., Ralph Emerson at the Barton organ; 7-8, musical program.

WLW, Cincinnati, Ohio (Central, Daylight, 423), 9:30 a. m., Sunday school; 11, devotional services, Church of the Covenant; sermon, Dr. Frank Stevenson; 7:45 p. m., sermon, Dr. Frederick McMillin, First Presbyterian Church of Walnut Hills; 8:45, Western and Southern orchestra, William Koop, director.

WNYC, New York, N. Y. (Eastern, Daylight, 526), 8:15-10 p. m., concert from Central Park.

WOAW, Omaha, Nebr. (Central, 526), 9 a. m., Radio chapel service; 9 p. m., musical chapel service, choir.

WOO, Philadelphia, Pa. (Eastern, Daylight, 509), 10:30 a. m., services, Bethany Temple; 2:30, Sunday school, Bethany Temple.

WOS, Jefferson City, Mo. (Central, 440.9), 7:30 p. m., complete religious service of the First Presbyterian church of Jefferson City, Mo.

WQJ, Chicago, Ill. (Central, Daylight, 447.5), 8-10 p. m., Babla Williams and his Rainbow Garden orchestra in concert; Otis Pike Jester, soprano; Mary House, pianist; Darlene Eggebrecht, violinist; Lancaster Smith, bass; Langdon Brothers, duets; James J. Whalen, tenor; Miss Edith Sackett, accompanist.

WSAI, Cincinnati, Ohio (Central, Daylight, 309), 3 p. m., sermon; 3:10, sacred chimes concert.

WSB, Atlanta, Ga. (Central, 429), 11 a. m., First Presbyterian church service; 5-6 p. m., Sabbath concert by Rev. Wesley Jenkins, blind evangelist and family; 7:30, Andrew Memorial church service.

WTAS, Elgin, Ill. (Central, 286), 2-5 p. m., Villa Olivia's star Sunday afternoon concert; 6:30-12, star concert dance program.

WJL, Detroit, Mich. (Eastern, 517), 11 a. m., services, St. Paul's Episcopal cathedral; 2 p. m., Detroit News orchestra.

WGO, Oakland, Calif. (Pacific, 312), 3 p. m., studio musical program; 4-5:30, Henry Halstead's dance orchestra; 5:30-6:30, Kiddies' Club; 8, educational program; 10-11 a. m., dance music.

KGW, Portland, Ore. (Pacific, 492), 3:30 p. m., literary program, Portland Library association; 8, concert.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Stanleys Celler cafe Hawaiian trio.

KQV, Pittsburgh, Pa. (Eastern, Daylight, 270), 10:30-11 a. m., music; 3-3:30 p. m., music; 8-9, popular song revue presented by Ben and Thelma Fields; 9-10, musical program.

WBAY, Columbus, Ohio (Eastern, 423), 12 m., Ila Lorbach Owens, pianist.

WCX, Detroit, Mich. (Eastern, 517), 4:15 p. m., musical program; 6, dinner concert; 8:30, musical program.

WOAF, Kansas City, Mo. (Central, 411), 3:30-4:30 p. m., the Star's Radio trio; 5-5:30, Boy Scouts program; 6-7, school of the air, music; 8-9:30, program by the Ivanhoe Masonic band; 11:45-1 a. m., night-hawk frolic.

WOAR, Philadelphia, Pa. (Eastern, Daylight, 395), 11:45 a. m., daily almanac; 12:02 p. m., Stanley theater organ recital; 12:30, Arcadia cafe concert orchestra; 2, Arcadia cafe concert orchestra; Edna Finestone, pianist; 4:30, talk, Mrs. Louis Love; 7:30, Dream Daddy's bedtime stories; 7:50, movie review, James A. Nassau; 8, Arcadia cafe concert orchestra; 9:10, Stanley theater symphony orchestra; 10, Arcadia cafe dance orchestra.

WEAF, New York, N. Y. (Eastern, Daylight, 492), 6-7 p. m., dinner music, Waldorf-Astoria hotel; 7-7:25, Wardman Park Trio; 8-8:15, Ansonia Clock concert; 8:30-10, Marine Band, Washington, D. C.; 10-10:15, Frederick J. Haskin.

WEAO, Columbus, Ohio (Eastern, 360), 1:30 p. m., educational lecture, member Ohio State university faculty.

WFI, Philadelphia, Pa. (Eastern, Daylight, 395), 1 p. m., Meyer Davis Bellevue Stratford concert orchestra; 3, closing prices, Chicago grain market; 3:05, Loretta Kerk, pianist; "Great Composers" talk, Mable Swain Ewer; 5, Sunny Jim, the kiddies' pal; 6:30, Meyer Davis Bellevue Stratford concert orchestra.

WGR, Buffalo, N. Y. (Eastern, Daylight, 319), 12:30-1 p. m., George Albert Bouchard, organist; 6:30-7:30, dinner music; 9-11, concert, Wheats Ice Cream company, featuring Eleanor Youtz, pianist; Arlow Matthews, director; 11:30, supper dance music, Vincent Lopez, Hotel Statler dance orchestra; Harold Giesler, director.

WGY, Schenectady, N. Y. (Eastern, 380), 1 p. m., "A Love for the Beautiful"; 7:15, "Planting Wheat to Notion of the Hessian Fly," C. R. Crosby; 7:45, "Movie Bliss" Quinn Martin; mandolin selection, Ruth Lucene Link, pianist; Marion Brewer, soprano; WHAS, Louisville, Ky. (Central, 400), 4-5 p. m., selections by the Alamo theater orchestra.

WHAZ, Troy, N. Y. (Eastern, 380), 9 p. m., second anniversary of WHAZ, Domino Novelty orchestra.

WHB, Kansas City, Mo. (Central, 411), 7-8 p. m., addresses, "Evolution of the Iowa League of Commercial Clubs," "Evolution of the Iowa Commercial Club"; music, Sweeney instrumental trio.

WHN, New York, N. Y. (Eastern, Daylight, 360), 2:15-2:45 p. m., Jimmy Clarke and his entertainers; 3-3:15, Gus Ackerman, pianist; 3:45-4, Uncle Robert's chat with children; 6:30-7:30, Olcott Vail's Trio and Paul Specht's Almac orchestra; 7:30-8, screen celebrities; 8-8:30, Roseland dance orchestra; 8:30-9, boy's period, Wm. J. Stuart; 9-9:30, Palisades Park orchestra; 10-11, Jack Shack and his orchestra; 12-2 a. m., Midnight Bohemia show.

WHO, Des Moines, Ia. (Central, 526), 7:30-9 p. m., musical program given by Ira Love Kendree, soprano; Cyril Kendree, tenor; Cyril Kendree, piano; Myrtle Thompson, pianist; Thelma Morgan, xylophone.

WIP, Philadelphia, Pa. (Eastern, Daylight, 509), 10 a. m., seashore gossip; 10:10, Bernarr MacFadden's health talks; 3 p. m., "What the wild waves are saying"; 3:30, Comfort's Philharmonic orchestra; 6:05, Florence Serenaders dance orchestra; 7, Uncle Wip's bedtime stories; 8, Comfort's Philharmonic orchestra; 8:50, Yessella's concert band; 10, Bob Leman's dance orchestra; 11, Karl Bonawitz, organist.

WJZ, New York, N. Y. (Eastern, Daylight, 455), 1 p. m., Hotel Vanderbilt orchestra; 7, Waldorf-Astoria dance orchestra; 9:30, concert orchestra of S. S. Francke; 10:30, Hotel Astor dance orchestra.

WLS, Chicago, Ill. (Central, Daylight, 345), 7:45 p. m., lullaby time; 8-1 a. m., National barn dance; Ralph Emerson, at Barton organ.

WMAQ, Chicago, Ill. (Central, Daylight, 447.5), 6:30 p. m., Hotel LaSalle orchestra; 8, Chicago quartette; 9, weekly Lalaban & Katz Chicago theater revue.

WMC, Memphis, Tenn. (Central, 500), 8:30 p. m., program by Philharmonic orchestra.

WNCN, Cincinnati, Ohio (Central, Daylight, 309), 10 p. m., special musical program; 11, Eddie Sides's Middle orchestra.

WNYC, New York, N. Y. (Eastern, Daylight, 526), 7:30-7:45 p. m., Police Alarms; 8:15-8:30, concert from Central Park; 10:30-10:45, Police Alarms; 11-11:15, official weather forecast.

WDAW, Omaha, Nebr. (Central, 526), 6 p. m., address; 6:30, dinner program; 9, program from vocal studio of Walter B. Graham, baritone, Regina Franklin, accompanist.

WDC, Davenport, Ia. (Central, 484), 9 p. m., orchestra program; Ralph W. Fuller, baritone soloist.

WDO, Philadelphia, Pa. (Eastern, Daylight, 509), 11 a. m., Mary E. Vogt, organist; 12:02 p. m., Wanamaker crystal tea room orchestra, Robert E. Golden, director; 4:45, Mary E. Vogt, organist; Wanamaker band.

WDR, Newark, N. J. (Eastern, Daylight, 405), 2:30-2:45 p. m., Florence Fromuelt, contralto; 2:45-3, Ray Goldberg, pianist; 3:30-3:45, Florence Fromuelt; 3:45-4, Ray Goldberg; 6:15-7, "Music While You Dine"; Charley Storm and his Collegians; 7:15-7:20, resume of days sports; 8-8:15, Mrs. John W. Anderson, soprano; Ethel Arizchi, pianist; 8:15-8:30, "How Adrenalin Gets Around"; Gilbert P. Farrar, lecturer; 8:30-8:45, Herman Gelhausen, baritone; 9:15-9:30, Mrs. John W. Anderson, soprano; 9:30-9:45, Julius Koehl, pianist; 9:45-10, Herman Gelhausen, baritone; 10-10:15, Julius Koehl; 10:15-11, Manhattan Screamers.

WQL, Chicago, Ill. (Central, Daylight, 447.5), 11-12 a. m., home economics program; talks; 3-4 p. m., "Koffee" Klatsch; special musical program; 7-8, Grace Nelson, 14-year-old pianist; Joe Garrity, Irish tenor; 10-2 a. m., Ralph Williams' orchestra; songs.

WRC, Washington, O. C. (Eastern, Daylight, 469), 7:45 p. m., bible talk; 8, song recital; 8:15, piano recital; 8:30, some recital; 9, to be announced.

WSAI, Cincinnati, Ohio (Central, Daylight, 309), 8 p. m., chimes concert; 8:30, special musical program; 9, weekly news review, Lutherford H. Cox; novel entertainment features.

WSB, Atlanta, Ga. (Central, 429), 12 m., entertainment; 3:30 p. m., baseball scores; 6, bedtime story; 8-9,

## Monday, September 15

KFKB, Milford, Kan. (Central, 286), 7:20-7:30 p. m., "College of the Air," Kansas State Agricultural college; 7:30, "The Development of the Hereford Breed"; 7:45, furnishing fruit; 8, music; 8:30, lecture.

KFX, Hastings, Nebr. (Central, 341), 9:30 p. m., dance orchestra.

KFOA, Seattle, Wash. Pacific, 455), 8:30 p. m., Babb's L. B. Ladies' orchestra.

WGO, Oakland, Calif. (Pacific, 312), 3 p. m., studio musical program; 4-5:30, Henry Halstead's dance orchestra; 5:30-6:30, Kiddies' Club; 8, educational program; 10-11 a. m., dance music.

KGW, Portland, Ore. (Pacific, 492), 3:30 p. m., literary program, Portland Library association; 8, concert.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Stanleys Celler cafe Hawaiian trio.

KQV, Pittsburgh, Pa. (Eastern, Daylight, 270), 10:30-11 a. m., music; 3-3:30 p. m., music; 8-9, popular song revue presented by Ben and Thelma Fields; 9-10, musical program.

WBAY, Columbus, Ohio (Eastern, 423), 12 m., Ila Lorbach Owens, pianist.

WCX, Detroit, Mich. (Eastern, 517), 4:15 p. m., musical program; 6, dinner concert; 8:30, musical program.

WOAF, Kansas City, Mo. (Central, 411), 3:30-4:30 p. m., the Star's Radio trio; 5-5:30, Boy Scouts program; 6-7, school of the air, music; 8-9:30, program by the Ivanhoe Masonic band; 11:45-1 a. m., night-hawk frolic.

WOAR, Philadelphia, Pa. (Eastern, Daylight, 395), 11:45 a. m., daily almanac; 12:02 p. m., Stanley theater organ recital; 12:30, Arcadia cafe concert orchestra; 2, Arcadia cafe concert orchestra; Edna Finestone, pianist; 4:30, Coffon Pickers dance orchestra; 7:30, Dream Daddy's bedtime stories.

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WBBR, New York City, N. Y. (Eastern, Daylight, 273), 8 p. m., vocal recital; 8:15, bible questions and answers; 8:45, vocal recital.

WBZ, Springfield, Mass. (Eastern, Daylight, 337), 6 p. m., Leo Reisman's Hotel Lenox ensemble; 6:30, orchestra; 7:30, bedtime story; 7:40, concert by the Hotel Kimball trio; 9, concert by the Boston Conservatory of Music.

WCAE, Pittsburgh, Pa. (Eastern, Daylight, 462), 3 p. m., Prof. Otto Kaltels, pianist; 6:30, dinner concert, William Penn hotel; 7:45, popular songs, Lew Kennedy; 9:30, musical program.

WOX, Detroit, Mich. (Eastern, 517), 4:15 p. m., musical program; 6, dinner concert.

WDAF, Kansas City, Mo. (Central, 411), 3:30-4:30 p. m., the Star's Radio orchestra; 6-7, school of the air, piano tuning in number on the Duo-Art; address, speaker from the editorial staff of the Star; the Tell-Me-a-Story lady; music, Carl Nordberg's Plantation players, Hotel Muehlebach; 11:45-1 a. m., nighthawk frolic, the "Merry Old Chief" and the Plantation players, Hotel Muehlebach; Kuhn-Chaquette orchestra, Kansas City club roof garden.

WDAR, Philadelphia, Pa. (Eastern, Daylight, 395), 11:45 a. m., daily almanac; 12:02 p. m., Stanley theater organ recital; 12:30, Arcadia cafe concert orchestra; 2, Arcadia cafe concert orchestra; Edna Finestone, pianist; 4:30, Cotton Pickers dance orchestra; 7:30, Dream Daddy's bedtime stories.

WOO, Philadelphia, Pa. (Eastern, Daylight, 509), 11 a. m., Mary E. Vogt, organist; 12:02 p. m., Wanamaker crystal tea room orchestra, Robert E. Golden, director; 4:45, Mary E. Vogt, organist; Wanamaker band.

WOR, Newark, N. J. (Eastern, Daylight, 405), 2:30-2:45 p. m., Florence Fromucht, contralto; 2:45-3, Ray Goldberg, pianist; 3:30-3:45, Florence Fromucht; 3:45-4, Ray Goldberg; 6:15-7, "Music While You Dine," Charley Storm and his Collegians; 7:15-7:30, resume of days sports; 8-8:15, Mrs. John W. Anderson, soprano; Ethel Arrighi, pianist; 8:15-8:30, "How Advertisements Are Built," Gilbert P. Farrar, lecturer; 8:30-8:45, Herman Gelhausen, baritone; 9:15-9:30, Mrs. John W. Anderson, soprano; 9:30-9:45, Julius Koehl, pianist; 9:45-10, Herman Gelhausen, baritone; 10-10:15, Julius Koehl; 10:15-11, Manhattan Serenaders.

WQJ, Chicago, Ill. (Central, Daylight, 447.5), 11-12 a. m., home economics program; talks; 3-4 p. m., "Koffee" Klatsch; special musical program; 7-8, Grace Nelson, 14-year-old pianist; Joe Garrity, Irish tenor; 10-2 a. m., Ralph Williams' orchestra; songs.

WRC, Washington, D. C. (Eastern, Daylight, 469), 7:45 p. m., bible talk; 8, song recital; 8:15, piano recital; 8:30, song recital; 9, to be announced.

WSAI, Cincinnati, Ohio (Central, Daylight, 309), 8 p. m., chimes concert; 8:30, special musical program; 9, weekly news review, Rutherford H. Cox; novel entertainment features.

WSB, Atlanta, Ga. (Central, 429), 12 m., entertainment; 3:30 p. m., baseball scores; 6, bedtime story; 8-9,

pianist; Darlene Eggbrecht, violinist; Lancaster Smith, basso; Langdon Brothers, duets; James J. Whalen, tenor; Miss Edith Sackett, accompanist.

WSAI, Cincinnati, Ohio (Central, Daylight, 309), 3 p. m., sermonettes; 3:10, sacred chimes concert.

WSB, Atlanta, Ga. (Central, 429), 11 a. m., First Presbyterian church service; 5-6 p. m., Sabbath concert by Rev. Andrew Jenkins, blind evangelist and family; 7:30, Wesley Memorial church service.

WTAS, Elgin, Ill. (Central, 286), 2-5 p. m., Villa Olivia's star Sunday afternoon concert; 6:30-12, star concert dance program.

WWJ, Detroit, Mich. (Eastern, 517), 11 a. m., services, St. Paul's Episcopal cathedral; 2 p. m., Detroit News orchestra.

**Monday, September 15**

WFKE, Milford, Kan. (Central, 286), 7:20-7:30 p. m., "College of the Air," Kansas State Agricultural college; 7:30, "The Development of the Hereford Breed"; 7:45, furnishing fruit; 8, music; 8:30, lecture.

WFKX, Hastings, Nebr. (Central, 341), 9:30 p. m., dance orchestra.

KFOA, Seattle, Wash. Pacific, 455), 8:30 p. m., Babb's B. B. Ladies' orchestra.

WJ, Detroit, Mich. (Eastern, 517), 8 a. m., setting-up exercises; R. J. Horton; 9:30, talk, women's editor, Detroit News; 12 m., Detroit News orchestra; 7 p. m., Detroit News orchestra.

WTAM, Cleveland, Ohio (Eastern, 390), 8 p. m., Everett Tyron's Melody Lane orchestra; solo numbers.

WTAS, Elgin, Ill. (Central, 286), 12:30-1:30 p. m., Morrison Hotel Terrace Garden noonday orchestral concert; 2-5, baseball scores; 7:15, Charley Huxley, playing Kimball organ; 7:20-7:45, WTAS orchestra in concert of symphonic dance numbers; 7:45-8, WTAS artists singing late popular songs; 8-8:30, orchestra; 8:30-8:45, the popular trio; 8:45-9, orchestra; 9-9:30, Hawaiian numbers; 9:30-10, WTAS orchestra; 10-11, Charley Huxley playing request numbers.

WWJ, Detroit, Mich. (Eastern, 517), 8 a. m., setting-up exercises; R. J. Horton; 9:30, talk, women's editor, Detroit News; 12 m., Detroit News orchestra; 7 p. m., Detroit News orchestra.

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Central, 440.9), 8 p. m.,  
son; 8:20, musical program  
supplementary program of piano solos by the "King  
of the Ivories."

Chicago, Ill. (Central, Daylight, 447.5), 11-12  
a. m., home economics program; 3-4, talks and special  
musical program; after 6, silent.

WRC, Washington, D. C. (Eastern, Daylight, 469), 3  
p. m., fashion developments; 3:10, song recital; 3:35,  
piano recital; 4, song recital; 6, stories for children.

WSAI, Cincinnati, Ohio (Central, Daylight, 309), 10  
p. m., popular program, Royal Garden orchestra.

WSB, Atlanta, Ga. (Central, 429), 12 m., entertainment;  
3:30 p. m., baseball reports; 6, bedtime stories; 8-9,  
Addio Britt, John Crindle, Scotch singer; 10:45, John  
Carson and his cronies.

WTAM, Cleveland, Ohio (Eastern, 390), 8 p. m., Everett  
Tyron's Melody Lane orchestra; solo numbers.

WTAS, Elgin, Ill. (Central, 286), 12:30-1:30 p. m.,  
Morrison Hotel Terrace Garden noonday orchestral  
concert; 2-5, baseball scores; 7:15, Charley Huxley,  
playing Kimball organ; 7:20-7:45, WTAS orchestra in  
concert of symphonic dance numbers; 7:45-8, WTAS  
artists singing late popular songs; 8-8:30, orchestra;  
8:30-8:45, the popular trio; 8:45-9, orchestra; 9-9:30,  
Hawaiian numbers; 9:30-10, WTAS orchestra; 10-11,  
Charley Huxley playing request numbers.

WWJ, Detroit, Mich. (Eastern, 517), 8 a. m., setting-up  
exercises; R. J. Horton; 9:30, talk, women's editor,  
Detroit News; 12 m., Detroit News orchestra; 7 p. m.,  
Detroit News orchestra.

Tuesday, September 16

(Continued from page 17)

KFKB, Milford, Kan. (Central, 286), 7:20-7:30 p. m., "College of the Air," Kansas State Agricultural College; 7:30, talk; 7:45, health and vigor; 8, music; 8:30, lecture.

KFNH, Shenandoah, Ia. (Central, 266), 7:30 p. m., dance music, Tetens orchestra.

KGD, Oakland, Calif. (Pacific, 312), 4-5:30 p. m., concert orchestra of the Hotel St. Francis, San Francisco; 8, program arranged by the Arion trio; 10-11 a. m., dance music program by Henry Halstead's orchestra and soloists, Hotel St. Francis, San Francisco.

KGW, Portland, Ore. (Pacific, 492), 3:30 p. m., children's program; 8, concert, Selberling-Lucas Music company.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., concert; 6-6:30, Art Hickman's concert orchestra, direction, Edward Fitzpatrick; 8:30-7:30, children's hour, Queen Titania and the Sandman; "American History," Prof. Walter Sylvester Hertzog; 8-10, de luxe concert.

WBAV, Columbus, Ohio (Eastern, 423), 12 m., Ila Lorbach Owens, pianist; 8 p. m., dance program, Charley Mobley's orchestra.

WCX, Detroit, Mich. (Eastern, 517), 4:15 p. m., musical program; 6, dinner concert; 10, Red Apple club.

WDAF, Kansas City, Mo. (Central, 411), 3:30-4:30 p. m., The Star's Radio trio; 6-7, school of the air, music; 11:45-1 a. m., Nighthawk frolic.

WDAF, Philadelphia, Pa. (Eastern, Daylight, 395), 11:15 a. m., daily almanac; 12:02 p. m., Stanley theater organ recital; 12:30, Arcadia cafe concert orchestra; 2, Arcadia cafe concert orchestra; 7:30, Dream Daddy's bedtime stories.

WEAF, New York, N. Y. (Eastern, Daylight, 492), 11-11:15 a. m., Board of Education; 11:30-11:45, motion picture forecast, Adèle Woodard; 4-4:45 p. m., Hotel St. George orchestra; 4:45-5, children's stories; 6-7, dinner music, Waldorf-Astoria hotel; 8:30-9, Gold Dust corporation; 9-10, National Carbon company.

WEAD, Columbus, Ohio (Eastern, 360), 1:30 p. m., educational lecture, member Ohio State university faculty.

WFI, Philadelphia, Pa. (Eastern, Daylight, 395), 1 p. m., Meyer Davis Bellevue Stratford concert orchestra; 3, closing prices, Chicago grain market; 3-3:05, Caroline Hoffman, pianist; 6, Sunny Jim, the kiddies' pal; 6:30, Meyer Davis Bellevue Stratford concert orchestra; 8, WFI male quartet.

WGR, Buffalo, N. Y. (Eastern, Daylight, 319), 12:30-1 p. m., George Albert Bouchard, organist; 6:30-7:30, dinner music.

WGY, Schenectady, N. Y. (Eastern, 380), 1 p. m., "Getting the Most out of the Food Dollar," 6, dinner music, Joseph A. Chickens and his Clover Club orchestra; 7:45, WGY orchestra; comedy, "A Single Man," WGY student players.

WHAS, Louisville, Ky. (Central, 400), 4-5 p. m., selections by the Alamo theater orchestra; 7:30-9, concert by the Zur Schuaided Harmony Diggers.

WHB, Kansas City, Mo. (Central, 411), 8-9:30 p. m., vocal soloists with the Frank R. Marks' orchestra; 10:30-11:30, popular dance music, Frank R. Marks' orchestra, Indian Village.

WHN, New York, N. Y. (Eastern, Daylight, 360), 2:15-3:15 p. m., Legu's State theater overture and vaudeville; 5-5:30, Original St. Louis Rhythm Kings; 6:30-7:30, Olcott Vail's Trio and Paul Specht's Alamae orchestra; 9:30-10, Palisades Park orchestra; 10-10:30, Bertram J. Goodman orchestra; 11:30-12, Club Alabain Revue.

WIP, Philadelphia, Pa. (Eastern, Daylight, 509), 10 a. m., seashore gossip; 10:10, Bernard MacFadden's health talks; 1, Karl Bonowitz, organist; 3, "What the wild waves are saying"; 3:30, Comfort's Philharmonic orchestra; 6:05, Ehrenzeller's concert orchestra; 7, Uncle Wip's bedtime stories; 8, Comfort's Philharmonic orchestra; 8:50, Vessella's concert band.

WJAX, Cleveland, Ohio (Eastern, 390), 7:30 p. m., programs arranged by Cleveland News-Leader; E. G. Johnson, bedtime story; Radio Cartoon talk, Don Pauer; Chester Rykas, pianist; Mrs. Marguerite

TABLE FOR MAKING TIME TRANSITIONS

Eastern Daylight Saving Time	1	2	3	4	5	6	7	8	9	10	11	12
Eastern, or Central Daylight Saving Time	12	1	2	3	4	5	6	7	8	9	10	11
Central, or Mountain Daylight Saving Time	11	12	1	2	3	4	5	6	7	8	9	10
Mountain, or Pacific Daylight Saving Time	10	11	12	1	2	3	4	5	6	7	8	9
Pacific Time	9	10	11	12	1	2	3	4	5	6	7	8

**HOW TO USE.** If a station is giving a program at 8 o'clock Mountain daylight saving time and you wish to find what this is equivalent to in Eastern time, find 8 o'clock in the third or Mountain daylight saving row. Then immediately above it in the same vertical column will be found the figure 9 in the Eastern time row. This indicates that the program would be heard at 9 o'clock Eastern time.

McGuineas, soprano; Martha Eglin, harpist; Hilda Rosen, readings.

WLD, Cincinnati, Ohio (Central, Daylight, 423), 10 p. m., Cummins orchestra; 10:25, Esberger's band; 11, Cummins orchestra; 11:20, novelty entertainment, Tunzi Trio; 11:35, Mastropala Trio; 11:55, Chubb-Steinberg orchestra.

WMAQ, Chicago, Ill. (Central, Daylight, 447.5), 4 p. m., talk on Red Cross home nursing course; 4:30, musical program; 6, Chicago theater organ recital; 6:30, Hotel LaSalle orchestra.

WMC, Memphis, Tenn. (Central, 500), 8:30 p. m., program by Mazza Grotto Glee club.

WNYC, New York, N. Y. (Eastern, Daylight, 526), 7:30-7:45 p. m., police alarms; 9:30-10, Ace Brigade and his 14 Virginians; 10:30-10:45, police alarms; 11-11:15, official weather forecast.

WDD, Philadelphia, Pa. (Eastern, Daylight, 509), 11 a. m., Mary E. Vogt, organist; 12:02 p. m., Wana-maker crystal tea room orchestra, Robert E. Golden, director; 4:45, Mary E. Vogt, organist.

WDR, Newark, N. J. (Eastern, Daylight, 405), 3:15-3:30 p. m., "Decorations in the Home," Charm Magazine; 6:15-7, "Music While You Dine," Elite orchestra; 7:15-7:30, resume of day's sports, Jolly Bill Steinke; 8-8:15, "Swimming Lessons," Frank E. Dalton; 8:15-8:30, "I See by the Papers," says Hollywood McCosker; 8:30-8:45, Leah M. Seley, soprano; 9-9:15, Sadye M. Gairn; 10-11; WOR Monday nighters.

WQJ, Chicago, Ill. (Central, Daylight, 447.5), 11-12 a. m., home economics program; 3-4 p. m., talks; 7-8, dinner concert by Ralph Williams and his Rainbow Garden orchestra; Merrie Boyd Mitchell, soprano; James Mitchell, baritone, Carl G. Liner, pianist; 10-2 a. m., Ralph Williams and his Rainbow Garden orchestra; Paul Loughier, tenor; Harry Geise and his "How Do You Do Song," Bernard and Robinson; "The Dixie Stars," Nubs Allen, soprano.

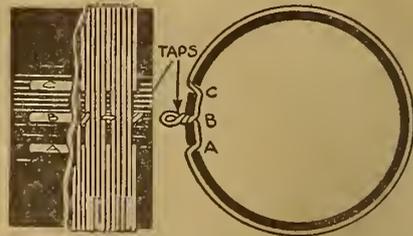
WRC, Washington, D. C. (Eastern, Daylight, 469), 6 p. m., children's hour; 8, to be announced; 9, political talk; 9:20, concert by a trio from Irving Boernstein's Wardman Park hotel orchestra.

WSAI, Cincinnati, Ohio (Central, Daylight, 309), 7 p. m., Hotel Gibson orchestra; 7:30, chimes concert; musical program; 8, Gibson orchestra; 9, special entertainment features.

WTAS, Elgin, Ill. (Central, 286), 12:30-1:30 p. m., Morrison Hotel orchestra; 2-5, baseball scores; 6:30-12, star concert program from Morrison Hotel Terrace Garden restaurant; selections by Charley Hughey; Charles Harrison.

WWJ, Detroit, Mich. (Eastern, 517), 9:30 a. m., talk, women's editor, Detroit News; 9:45, Fred Shaw, pianist and singer; 12 m., Detroit News orchestra; 7, Detroit News orchestra.

B again. This should be done a short distance from the end of the slot so that when the wire is put through the slot B the last time it can be put through between the other wire and the end of the slot. Pull this up tight and proceed to wind. Wind on the amount of turns desired to the first tap, and cut the wire, allowing 3 or 4 inches for the tap, and put it in through the slot C and out through slot B. This completes one tap. To start the next turns, put the end of the remaining wire through the slot A and out through the slot B allowing about 2 inches for twisting, then proceed to the next tap and repeat the entire operation. The end of the coil is fastened in the same manner as the start. Leave the twisting of the wires until the coil is all wound, then remove the covering from the wires and twist and solder. This saves going over it the second time, as in



—AS DESIRED—

Coil Winding

After trying several methods of winding coils for couplers or ordinary inductances, I developed the following method. This method may take a little longer than some others, but the result pays for the time that it takes:

First determine the size of tubing, then find the length in this manner: Figure the amount of turns you want to be put on the tube, the size of the wire to be used, and then the amount of space these turns will take up, on the tube. Get the tube  $\frac{3}{4}$  to 1 inch longer than the windings will measure. Use a bakelite of a good composition tube.

Mark off three lines  $\frac{3}{8}$  to  $\frac{1}{2}$  inch apart along one side of the tube, and square with the end, take a  $\frac{1}{8}$  inch drill and drill 3 or 4 holes along one line, starting  $\frac{3}{8}$  to  $\frac{1}{2}$  inch from one end. These holes should overlap. Take a small flat file and square up the sides until there is a slit  $\frac{1}{2}$  inch long and  $\frac{1}{8}$  inch wide. Bolt 3 or 4 hack saw blades together and saw them down the remainder of the line to where the windings will stop. After sawing each line take the file and round off the edges of the slots.

Start the coil by putting the end of wire in through slot A, putting through 4 to 6 inches of wire so to leave enough for the tap, then bring back out through slot B and in through slot C and out through slot

winding, the wire will work loose a little, where there are taps every turn, use 4 slots instead of 3, alternating with the taps.

I have used this method of winding for variocouplers and find it is better than where some method of cementing the wire to the tube is used.

I have used the method of drilling 3 holes, instead of three slots, but find that in winding the coil the holes do not always come up to the place for the taps.—E. L. Kruppenbacher, St. Paul, Minn.

To Eliminate Howling

Howling in a set can probably be overcome by separating the plate and grid leads, and running them at right angles. If this fails to stop the noise, shield the back of the panel by covering it with a thin sheet of tinfoil and connecting the foil to the ground. Care should be taken, however, to see that no metal part of an instrument touches the grounded foil.

100,000 SQUARE FEET OF EXHIBITS

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Radio World's Fair

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CASH PRIZES and SILVER CUPS for

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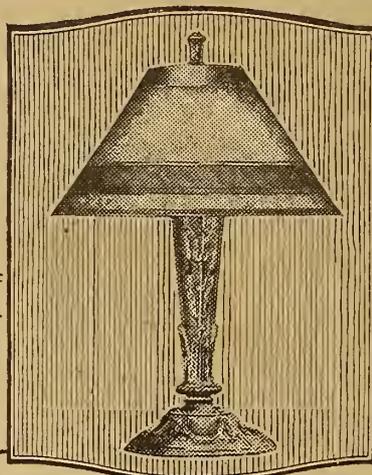
Enter your set in the Great Contest. Send at once for information and entry blanks.

TO

Business Office HOTEL PRINCE GEORGE New York City

Direction of U. J. HERRMANN James F. Kerr

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Mfd. under U. S. Pat. No. 1,155,987, 1,272,841. Other patents pending.

Have You Heard This Wonderful Loud Speaker

If you walked into a room where a Radialamp is reproducing a concert you would wonder where the remarkable loud speaker was hidden. Certainly you would never suspect the superb table lamp, a matchless piece of lighting art, of being a Radio Loud Speaker as well.

chamber inside the parchment shade which further purifies it. This combination reproduces radio music as it has never been done before. "It is simply wonderful," agree Radio Experts.

You Bathe in the Soft Mellow Light

And when you consider too, the soft mellow light that the Radialamp sheds—when you see what an ornament it is even to the most magnificently furnished interior, you wonder that the Radialamp can be sold for the astonishingly low price. Radialamp has come to stay—even if you have an old type loud speaker you can attach the Radialamp to a long wire and use it in a room many feet from your Radio set. Come in and see it—hear it—you will want one at once.

Floods Room with Beautiful Music

And yet that is just what the Radialamp is. In the base of this wonder lamp is the latest perfected microphone. Up thru the long graceful metal cast stem, the sound vibrations are amplified to be reflected from the "sound mirror" in the top of the shade. This clarifies the extra high and low notes. Then the sound is carried thru the light-heated air

For sale at any good Radio Dealer. If he hasn't a Radialamp in stock you can get complete description and information if you write to the

RADIALAMP CO., Dept. 510, 334 Fifth Ave., N. Y.

RADIALAMP TRADE MARK LOUD SPEAKER

# OPERATING AND TROUBLE SHOOTING

## For the Owner of an Echophone Model "F" Receiver

**O**PERATING and Trouble Shooting" is a Radio Digest feature whose purpose is to study the late models of various standard receiving sets and to show the newly initiated Radiocast listener, who has purchased such a set, how he can operate it to get the best there is in it and how he can overcome minor difficulties which may be causing some trouble. On page 19 this week the Echophone "Model F" Receiver is described. Radiophans with other sets will also find these articles worth while reading, particularly the notes on trouble finding.

**T**HE Echophone Model "F" receiver is of an improved type, employing two stages of Radio frequency amplification, detector and two stages of audio frequency amplification, and operates with exceptional selectivity on either antenna or loop. Using the loop, under favorable conditions, a loud speaker range of 1,000 miles may be obtained, while with an antenna 50 to 75 feet long and 30 to 40 feet high, distances up to 3,000 miles or more may be had.

The wave length range is from 225 to 580 meters when used with loop or antenna of proper dimensions.

### General Information

The Model "F" receiver is furnished complete, ready to operate and consists of the following apparatus:

- 1 Model "F" panel.
- 1 Cabinet.
- 4 22½ volt "B" batteries.
- 3 1½ volt "A" batteries.
- 1 4½ volt "C" battery.
- 5 UV-199 or C-299 tubes.
- 1 Loop.
- 1 Pair head phones.
- 1 Loud speaker.
- 2 Plugs.
- 1 5 Megohm grid leak (Detector).
- 1 .01 Megohm grid leak. (To be used with certain types of loud speakers.)

When shipped, the middle section of sub panel will be found tied down to prevent damage to wiring in shipment. The strings should be removed before placing set in operation.

### Operation

See that the upper left hand control or rheostat is in the off position. Connect the antenna and ground or loop. Place the small switch on left end of the binding post sub panel on "loop" or "antenna," whichever is to be used. Insert the tubes in the sockets. Turn the upper left control or rheostat to the right until the voltmeter indicates 3 volts. Select the station desired by means of the selector control and refer to the following chart:

Wave length	Selector	Secondary wave length	Wave length range of selector points
250	1	18 Degrees	225 to 300
300	2	25 Degrees	300 to 350
350	2	33 Degrees	350 to 400
400	3	44 Degrees	375 to 450
450	3	54 Degrees	450 to 500
500	4	65 Degrees	425 to 500
550	4	83 Degrees	425 to 580

This chart is for use with antenna. Loop calibration will depend on size of loop, number of turns, etc. Column 2 applies to both antenna and loop.

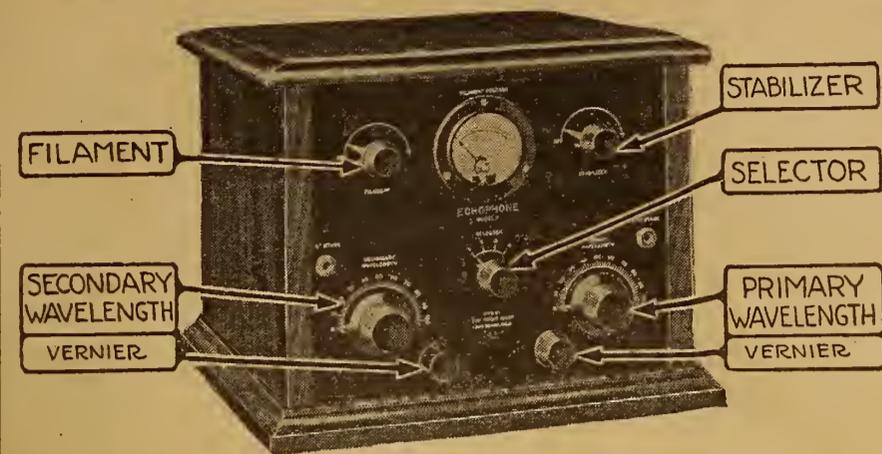
### Using Loop

Turn the primary wave length control to zero. Turn the upper right or stabilizer control to the right until the set oscillates, at the same time moving the secondary wave length control backward and forward until the station carrier wave or whistle is picked up. Now turn stabilizer back and at the same time move secondary control backward and forward by means of the vernier knob until the station comes in clearly and with the desired volume.

A loop consisting of 10 turns spaced ½ inch apart wound on a frame 2 feet square, is recommended.

### Using Antenna and Ground

Select the station desired by referring to chart and by means of selector. Set the secondary wave length control on that part of scale determined by column 3 of chart. Turn stabilizer to the right and at the same time move primary wave length control slowly backward and forward up and down the scale until a point is reached where two distinct clicks are



heard when the primary control is moved a fraction of an inch to the right and then to the left. Now by means of the two vernier controls move both primary and secondary controls backward and forward together until the station is brought in. The greatest selectivity will be obtained when the set is caused to oscillate and the desired signal is tuned in at a point midway between the two clicks on the primary wave length control.

### General Information

When properly used, this set can be made to operate with exceptional selectivity and when used in this sensitive condition, the various controls should be moved very slowly or the station you are attempting to tune in will be passed over and missed entirely.

When first placing the set in operation, always change the tubes around until the best results are obtained as some tubes are better Radio frequency amplifiers than others. Facing the set and looking down on the sub panel, the Radio frequency tubes are the second and third tubes from the right side.

If the set refuses to oscillate, the trouble can usually be traced to defective Radio frequency tubes.

### Caution

Never change batteries with tubes in the sockets. Always remove tubes before making any changes in connections. Never

operate tubes at a higher temperature than three volts. To do so will very materially shorten their useful operating life.

## Some Ways to Improve Reception on Your Set

Though the set now in use may be doing good work, both on local stations and distant stations, there is always room for improvement. Beginning at the first part that one uses for the reception of signals, we will go on down through the line, suggesting various places where the set may be improved to such an extent that it will be possible to receive better music and speech.

The aerial leads the list. As porcelain is the best insulator available today, that is the type one should use. Insulators of this material should be about 4 or 5 inches long. Look over the lead-in wire. Be sure that it is soldered and that there is no chance for it to break from a strain.

For efficiency, the lead-in wire should be at least 5 inches away from the wall of the house. The ground connection should be made to a water pipe. The most efficient way to do this is to first clean the pipe, wrap tinfoil tightly around the cleaned area, then put the ground clamp on and solder the connection.

In the primary of the tuning coil eliminate as much wire as possible. If the coupler is one that responds to 3,000 meters take off all the wire that is not used when receiving some high-wave station such as KYW. The secondary of the tuner should be one having as much wire as possible, that is, of course, if the tuner is a variocoupler. The reason for this is that the more inductance the higher the grid voltage that may be obtained. In crystal sets the same holds true.

All the condensers in the circuit may be improved materially by taking them off the panel and pig-tailing them. Solder a flexible wire to the shaft of the rotary plates and use the end of this wire as the rotary connection.

The fixed condensers in the circuit, such as the grid and phone condensers, should be of rugged construction and have a mica dielectric. Variable grid leaks seldom aid enough to warrant taking a chance on getting an inferior one and have it make disturbing noises.

In the audio-frequency amplifier, as has been said many times before, use a C battery of about four volts or higher. This will clear up the signals to a surprising degree. Also the drain on the B batteries is lowered to almost one-third of the former drain, without the C battery. It is seldom that the ratio of the transformers makes enough difference to warrant spending the extra money.

As a final word, look over the set carefully and see whether a lead may be made shorter. If by moving some bit of apparatus, a grid or plate lead can be made shorter without lengthening another lead, change it, as the increase in efficiency is worth the time.

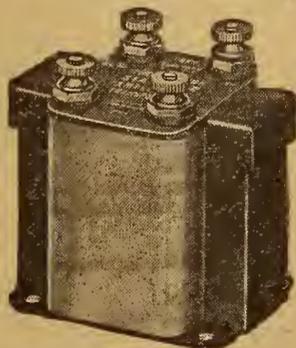
### Solid Wire Connection

When wiring a Radio receiving set most fans use bus bar. There seems to be the impression that this is the only wire that can be used if the set is to operate efficiently. In place of bus bar wire solid copper wire number 14 can be used with equal and generally better results. For a neat job the wire should be hard drawn, but for efficiency it should be soft drawn. This wire comes in large rolls and is sold by the pound. To straighten the wire it should be cut into foot lengths and then the bends taken out of each strip with a pair of pliers.

When you find a better Transformer it will bear the name.

# THORDARSON

- 2-1 Ratio \$5.00
- 3½-1 Ratio \$4.00
- 6-1 Ratio \$4.50



The mirror of the Broadcasting Studio

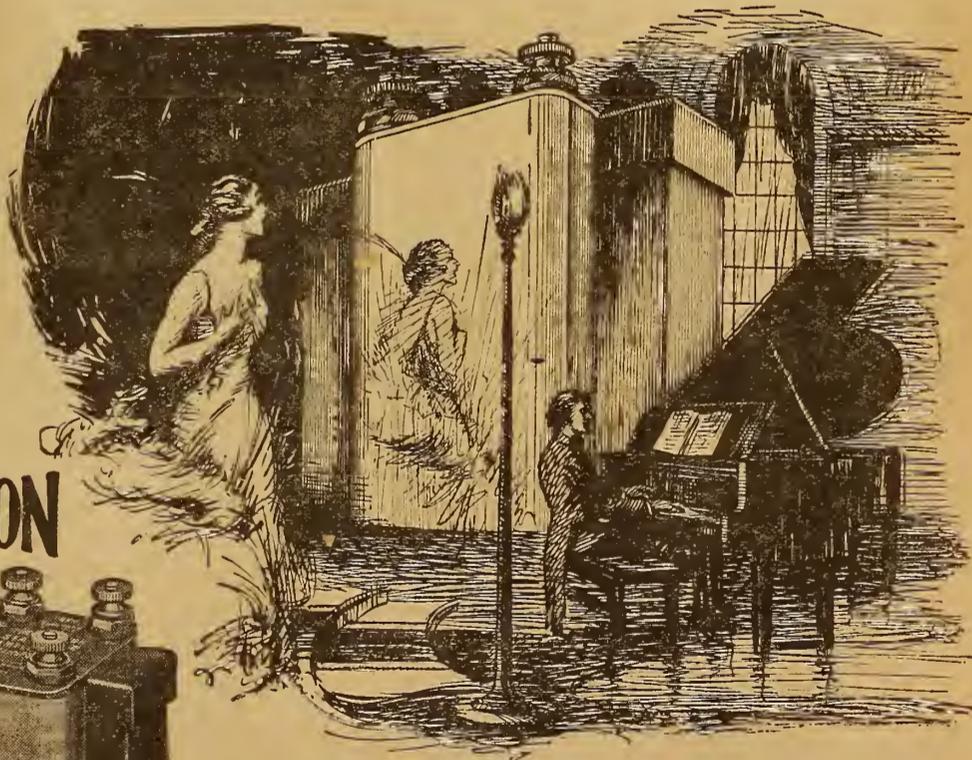
## SUPER TRANSFORMER—2 to 1 Ratio (audio frequency)

The Thordarson 2 to 1 ratio amplifying transformer is indeed the mirror of the broadcasting studio. It seemingly brings the artists direct to your home. Install a pair—it will take you but a few moments—and you will marvel at the richness of the musical qualities obtained.

THORDARSON ELECTRIC MFG. CO.

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# Radio Digest

PROGRAMS  
Illustrated

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## Medium for Unbiased Expression

**No Special Interests Control What the Air Carries**  
RADIOCASTING stations are discovering their definite obligations. They are discovering that a Radiocast station is a medium for the unbiased expression of the voice of the people. It Radiocasts what the republicans have to say, but it also sends forth the sentiments of the democrats. It Radiocasts the Sunday school of the Methodists, but also with the church services of the Presbyterians. It is a medium for general expression, not a tool for personal advancement.

Another obligation falling on the station is to sustain its quality of programs throughout all the seasons of the year. During Radio's first summers, when low powered stations were the rule rather than the exception, there was a great deal of short sighted talk about closing down until cool weather came again, but now there is little exception to closing down. The trend is much toward keeping them all going and to have power to pass through interference.

In the general sense, however, the activities of Radiocasting have continued with intense zeal. This is the natural order of things. It is no longer a question of giving either the public or the studio employes a rest or a vacation; for Radio has evolved from an amusement to a necessity, from a toy to an obligation. Imagine, if you please, just one class of Radio listeners: the shut-ins. Do they get a vacation? Does summer mean balmy breezes, pleasant trips, happy outings, camping parties and a season of merriment No! not at all.

Consider the farmer's wife who takes down the market reports while the husband is busy in the field. Think of the families living in the small towns and in the country who may sit in comfort on the front porch listening to an opera from some distant metropolis. Why should Radio be denied these folks just because the weather is warm? And these are but a few illustrations of the many definite, firm and natural interests, the bonds of which demand of Radio high quality programs the year around.

## Presidential Campaign

**Extensive Traveling to Reach Public Not Necessary**  
PRESIDENT Coolidge and John W. Davis will use the Radio to reach the people during the campaign. A means of disseminating thought, scarcely known four years ago, has come, in this brief period, into almost general use. Literally millions of homes, to say nothing of offices and places of public assemblage, are equipped with the instrument that permits them to hear the president or any candidate for office, when he makes an address. "Swings-around-the-circle" which sap the energy, vitality and strength of candidates, front porch pilgrimages and parties, have been relegated by the development of the air and electricity as mediums of transmission of sound.

The presidential campaign this year should be the quietest yet the most effective, in the history of the nation.

## Aviator's Need

### Radio Directs in Long Distance Flights

FROM the standpoint of commercial aviation, Radio is the one means by which air navigation may be considered with peculiar safety. By means of Radio aircraft may communicate with surface stations, with other aircraft and also receive the necessary information to take advantage of weather conditions and keep constantly in touch with the world below.

Communication is the essence of modern strategy and tactics. The airplane equipped with Radio furnishes the quickest and most reliable means of communication known to modern warfare.

Without Radio, military and naval aircraft are nevertheless instruments and their co-ordinating duties would be seriously hampered were it not for the remarkable aid which Radio gives under all conditions.

## RADIO INDI-GEST

### You're Right! S'too Bad

Dear Indi: I think this Radio is all bunk! So far I've only heard 493 stations, so I am thinking of returning my set to the manufacturer and demanding my money back. There's around 550 stations in the U. S. and I can't figure out why I don't get the rest of them.

Although I get all the European stations on the loud speaker, they are not loud enough to be heard more than three blocks away. They say it's the summer weather, but what do you think? GLOOMY GUS.  
P. S.—I've had my 1-tube set almost 2 months now.

### "Listenin' In"

7 P. M.

When I get home in the evenin',  
After workin' hard all day,  
I tune in on my super het,  
And find KDKA.

9:30 P. M.

Then: "This is KFKX at Hastings,  
'Tis the voice of the announcer man,  
Well, I listen in for an hour or so  
To the notes of the "McThayal grand."

10:30 P. M.

By swingin' the dials a little,  
I get in Dallas, WFAA.  
Gee, but that's some music  
To chase the blues away.

12 Midnite

With WSAI at Cincinnati,  
And his "Dixie Entertainers,"  
Let's get a gun and look  
For those dog-gone complainers.

1 A. M.

Well, here's old WDAF  
With his merry "Nite Hawk Frolic."  
But now my listening in is done,  
'Cause the baby's got the colic.  
SAM BONANO.

### Say It with Flowers

Dear Indi: Last fall I was conducting an inexhaustible research into the profound mysteries of the single circuit regenerative receiver, and I kept the tube oscillating freely.

My neighbor next door came over and angrily insisted that I turn off my set and go to bed, but I politely refused. He became very enraged, still I refused to turn off my set.

Then he—well, anyway, during the next four weeks I operated my crystal set from a bed in the hospital. Ain't experience a wonderful teacher? I. NOA LOTT.

Moral—'Tis healthier to heed your neighbor's advice than it is to keep oscillating.

### Mrs. Partington Speaks Out

Dear Indi: Mizz Partington says she's heard by Radio, the two vice-presidents accepting the diagrams and hook-ups of their parties for the November contest, only she had to listen in to the Cincinnati Enquirer for Brother Charles' lecture, as her tubes wouldn't oscillate so far from home as KFKX on Monday night.

She says his speech was a Commoner editorial broadcasted for and in honor of the Farmer and Labor Parties' Progressive votes.

The conservative end of it, and the rawhiding of the Republicans is Mr. Davis' part of the work; anyway, Pat Harrison was there.

Last night KDKA and Graham McNamee brought General Dawes to town, applause and all. The General got down to "brass tacks," right off. He is an earnest exhorter, like Billy Sunday.

He handled facts and figures right well, and he sure knows his stuff; didn't use no small change, neither. She says he didn't cuss none, but she bets he would when necessary.

W. Z. Foster don't like the broadcasting of President Coolidge, nor John W. Davis; he says they are both agents of Wall Street, but she says its a heap better to be that way, for any American, than to be a hired agent of Communism, Anarchy, Revolution and Disruption of the best country any poor man ever lived in.  
SIGNING OFF.

### Ku Klux Him!

There is a young ham from Milwaukee,  
His Radio he's made, and you mark me,  
I'll bet it's a blooper,  
A single tube souper,  
And an all-fired strong little squawkee.

If he puts it up in our city,  
I know he'll deserve all your pity.  
His aerial will short,  
His guy wires part,  
And he'll say things unfit for this ditty.  
5XV.

### Station E. A. T.

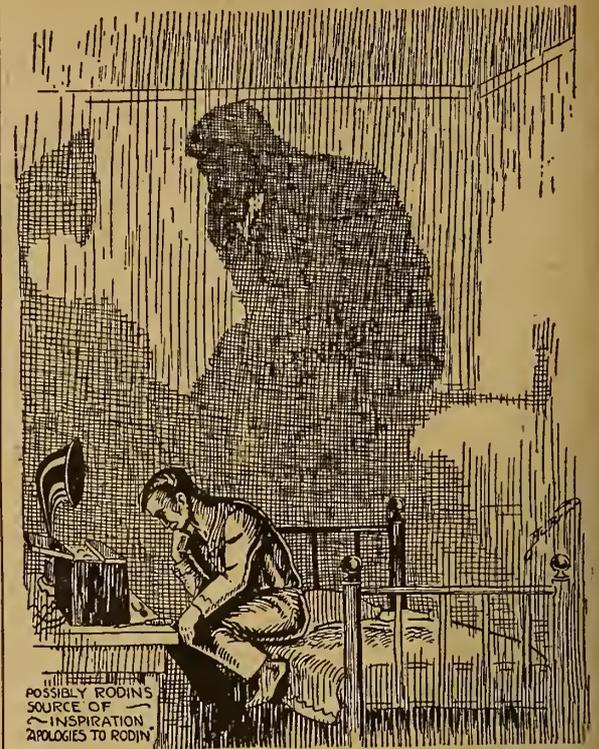
Teddy was being too noisy over his soup and his father reprimanded him rather sharply, saying:

"You don't need to tell the world what you have for dinner."  
"But, daddy, I'm broadcasting." E. J. MOODY.

### Living Up to the Name

Dear Indi: You will be interested to know that the "Little Jesse James" company, playing in Boston, asked WNAC \$5,000 before they would allow the musical comedy to be Radiocast. That is, they ASKED the five grand. They didn't get it! BLIND BAGGAGE.

## In the Hall Bedroom



POSSIBLY RODIN'S  
SOURCE OF  
INSPIRATION  
APOLOGUES TO RODIN

## Condensed

By DIELECTRIC

A Radiocasting station may become as much a part of one's friendly associates as the club and when it ceases to exist you feel the loss of an accustomed place to go to. WLAG, known so long as "The Call of the North," has left the air of necessity and many fans throughout the country deplore its absence. One looks to certain stations for cheery announcements and greetings from their announcers. It is unfortunate when circumstances compel them to close down. Let's hope for reopening.

At times we read of establishing the identity of a person whose voice is heard over the Radio, either as a long lost relative or friend, by some listener to one of the many Radiocast stations. This is quite possible. Perhaps more romantic is the account of Convict C 1412, with three years of a sentence yet to serve, whose singing from the Eastern Penitentiary invoked the interest of a prominent Philadelphia lawyer and the latter's aid resulted in the parole of the prisoner.

The R. C. A. maintains two studios in their Radiocast building in New York city, one operating on a wave of 455 meters, the other on 405. Until more recently this company has assigned to the higher wave length features of extraordinary interest to the listening public. In the vicinity of New York, WJY (on 405 meters) is one of the poorest stations for reception, and the recent Tunney-Carpentier fight was followed with difficulty because of that fact

Either the French Radiophans are given to searching for the easiest method by which they may listen, saving themselves as much effort as possible, or they seek means of catching the ether messages from whatever comfortable spot their bodies repose in. I don't censure them in either case. Crystal sets have appeared over there in compact form for carrying upon the person and capable of picking up words over a distance of eleven miles. The chief attraction of such sets seem to lie in their providing the owners with current quotations on the exchange rates on the Franc and dollar, which are Radiocast every half hour from Eiffel Tower. Bourse manipulators may be at ease in cafes while gathering this information. Whatever serves to supply information is acceptable.

We are constantly advancing in knowledge as pertains to the "dead spots" for Radio reception. Either we arbitrarily pronounce a certain section "dead" so far as Radio is concerned, or discover it so to be. In the latter case Radio engineers are busily at work trying to determine the exact cause for such a phenomenon. In the former instance it is assumed that the surrounding country by its nature precludes the possibility of receiving Radio messages. There are instances to disprove this theory and the latest is that of an engineering party in the Mojave desert to whom came Radio signals from Station WHB in Kansas City.

For some time ships have relied on the Radio compass for determining their location at sea, a method by which serious accidents have been avoided as when they were approaching too closely to shore. That the same method may apply to airships there is no reason to doubt, yet until quite recently no effort had been made to substantiate this conclusion. The Shenandoah in approaching New York city entered a heavy fog and asked the New York Harbor Radio stations for her bearings. Her position was determined with sufficient accuracy to prove the efficiency of the Radio compass for such purposes. No doubt it will be commonly used.

# 30 Minute A-B-C Lessons for Radio Beginners

## Chapter XXIV—The Radiocast Listener

By P. E. Edelman

THE majority of Radiocast listeners have come into existence as such since the fall of 1921. Radio telephony was carried out on more or less commercial and experimental scale for many years previous to this, but aside from an extra experimental concert now and then, very little Radiocasting was done before 1916. The present popularity is due to organized effort to broadcast programs of general interest.

One who listens only to Radiocasts is at times likely to narrow to the view that Radio is good for nothing else. Radio as a means of communication has been very important for nearly two decades. Previously there was no way to communicate over distances to and between ships at sea nor over inaccessible regions. Commercial Radio telegraphy has played very important parts in military and naval intelligence communication, and in every day traffic is right now giving cable lines a close race for leadership. Radio may yet give line telegraph and telephone systems a good run to maintain leadership. Even today much wire line communication is done on the Radio or the wired wireless principle. Essentially Radio circuits are used and the wire merely serves as a guide for the carrier current. Systems of multiplex telephone and telegraph communication depend on the use of wired wireless or carrier waves.

Radio also shows prospects of automatic control or teledynamics. Battleships have been operated at a distance via Radio waves. Airplanes can be so controlled. Signatures and photographs have been transmitted via Radio waves by using suitable light sensitive cells to change light variations into electrical modulating currents. The possibility of motion pictures transmitted via Radio waves has also been demonstrated. Radio provides a carrier for transmission of intelligence and can be used to convey any form of controlling or regulating current. All that is necessary is a device to change the first form of energy into electrical pulsations which can modulate a transmitted series of Radio waves, and provide a receiving device to translate back into useful form, or reproduce the original kind of energy effect, as desired.

### The Radio Amateur

Much of the present Radiocasting can be traced and is due to the efforts of amateurs. It was amateurs who first demonstrated the value of transmission on short wave lengths and worked out

apparatus suitable thereto. There are possibly 20,000 amateur transmitting stations working today. With an outfit costing possibly as little as \$200.00, an amateur operator can talk directly with others in all parts of the country and with many foreign countries. They have an organized relaying system and can eventually cover most every civilized center in the world. Most such communication is conducted by code and abbreviated spelling. The code is easy to learn. Amateurs use wave lengths usually under 200 meters.

A different use of wired wireless has been tried to perform the function of Radiocasting. Instead of sending out the waves in all directions, they are directed by the transmitter over the wires of a power line system to paid subscribers. One advantage is that simple receiving apparatus suffices, requiring "push button" only to get the program. It is less likely to be interfered with by outside interference. If the transmitter supplies sufficiently varied programs and includes rebroadcasts by wired wireless, subscribers may be satisfied. It is well to remember, that in the United States where line telephones are in by far the greatest per capita use, telephone apparatus is rented, whereas in some foreign countries, each subscriber to service has to purchase his apparatus. Certain foreign countries are tending to go into the broadcasting question on a similar basis.

It is possible for a local Radiocast station to furnish programs intercepted from distant stations, so that nearby listeners with simple apparatus can eventually hear anything going on, by asking for it. Even when this is extensively done, there will remain some listeners who prefer direct reception independent of an intermediate operator at a Radiocasting station. Re-radiocasting can, however, satisfy a large public by providing any of several different kinds of programs at will.

As conducted today, Radiocasting has just grown. Most Radiocasting stations aim to please their listeners and many will follow out suggestion of listeners or even grant special requests when convenient. A listener must take what is Radiocast or leave it but can have a voice in the general character of what is transmitted as well as certain special numbers on programs. The industry resembles the early days when it was considered so wonderful just to see any sort of flickered moving picture that no attention was paid to possible perfections

in directing technique. The toy days of Radiocasting are passing.

### Why Radiocasters Do It

Why do they Radiocast? Some do it because it pays. Others to help the continued sales of apparatus and parts. Others for pure publicity or propaganda or paid advertising returns. Others, really, for much the same reason that a public speaker goes on the platform. They like the idea of talking to a vast audience and enjoy the thrill of having listeners. In general, Radiocasters get as much benefit as the listeners do, or more, or else close up shop. Anything which can be conveyed to ears is suitable material for consideration for Radiocasting. More and more it must gain importance in spreading intelligence, news, information, education, and dramatic readings as well as music and lighter entertainment.

It seems that an impressario of Radio will develop to more fully perfect the technique and utilize the possibilities of Radiocasting. In the motion picture industry, Griffith and others introduced changes much as may be looked for in Radiocasting. Present day announcers, good and bad, have just taken the matter up. Some at best are a mixture of introducers, program arrangers, toastmasters, and play the part of host to the Radio audience. Others are entirely lacking in anything above mediocrity and disappoint the public. Satisfied listeners make a Radiocasting station gain in influence just

as do the subscribers to a periodical which pleases its readers.

The best lecture usually reach small audiences compared to the numbers which are instantly within hearing via Radio. The instruction possibilities of Radio have hardly been touched to date. The time is coming when the necessary diagrams and illustrations will be printed in newspapers or publications along with announcements of such programs, so that the speaker at a Radiocasting station can talk to listeners with reference to the illustrations placed in their hands. No lecturer can do much more, and the best educational facilities can thus be made available to hundreds of thousands of the public, however isolated. Agricultural information is already spreading to a greater extent than may be supposed by such Radio extension courses from western Radiocast stations.

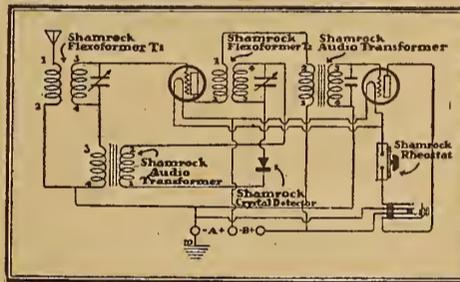
### Specialized Radiocasters Coming

Specialized Radiocasting can be looked for much as certain as theaters specialize on plays or operatic productions. There will be the varied programs and jerky changes from one class of broadcasting to another, but the time is coming when certain stations will give more attention to directed programs of pretentious character.

Only certain kinds of plays are suitable for satisfactory Radiocasting. There may develop an art of rewriting stories (Continued on page 22)



## Announcing The Radio Marvel of 1924



### The Sensational Shamrock-Harkness Reflex



### SHAMROCK HARKNESS KIT

Contains all parts to build the Shamrock-Harkness Reflex

Licensed under U. S. Patent Office Serial No. 719,264 for Radio Receiver Stations.

LIST PRICE

# \$35

The set for the masses as well as the classes

THE Shamrock-Harkness Reflex has created a sensation among experimenters and amateurs by its amazing performance. Combines the best features of the most powerful circuits in use today. A set that you can build yourself in a half-day—and get results equal to a standard five-tube receiver.

- Operates a loud speaker.
- Two tubes do the work of five.
- Cuts battery cost 60 per cent.
- Does not squeal or radiate.
- Stations can be logged—and come in with amazing clearness and volume.

The astonishing performance of the Shamrock-Harkness receiver depends as much upon the use of specially designed parts and the mechanical arrangement of these parts—as upon the wonderful circuit itself. Shamrock engineers have spent months perfecting a set of these parts. The Shamrock Kit contains genuine, guaranteed Harkness parts. Avoid imitations—accept only the genuine.

BEFORE BUILDING YOUR SET SEND FOR THE BOOK BELOW

Dept. 27-A, Market St., Newark, N. J.



SHAMROCK MANUFACTURING CO., Dept. 27-A, Market St., Newark, N. J.

I enclose 10 cents (U. S. stamps or coin) for copy of "Shamrock Radio Builder's Guide Book," which contains diagrams and complete instructions for building 10 sets at prices ranging from \$15 to \$50.

Name .....

Address .....

Dealer's Name .....

**Radio EQUIPMENT**

Write for your free copy of

**Ward's Radio Catalogue**

MONTGOMERY WARD  
Chicago Kansas City St. Paul Portland, Ore. Oakland, Cal. Ft. Worth

A Valuable 68-Page Reference Book on Radio—a Market Place for the Best in Sets and Parts

We want you to have a copy of Ward's new Radio Catalogue. You will find it to be an encyclopedia of information on Radio, the liveliest topic of the day. It contains a new Radio map—diagrams of the best hook-ups—descriptions of complete sets, and standard parts for building sets.

Headquarters for Radio  
Montgomery Ward offers you all types

# Montgomery Ward & Co.

The Oldest Mail Order House is Today the Most Progressive

Chicago Kansas City St. Paul Portland, Ore. Oakland, Cal. Ft. Worth

of Radio Equipment at a saving. We sell direct to you only merchandise of highest quality. Everything you buy from us, carries our 52-year-old guarantee—"Your money back if you are not satisfied."

Enjoy the Long Winter Evenings  
Every form of entertainment can be brought into your home by Radio. Keep in touch with the world—Sports—Election Returns—Dance Music—Speeches—Sermons—Current Events—you can enjoy them all by Radio.

Write today for your copy of this complete Radio Catalogue. Address our house nearest you: Dept. 41-R.

ESTABLISHED 1872

### THIRTY MINUTE A-B-C

(Continued from page 21)

suitable for Radiocasting, as previous attempts fall short of the mark. Motion pictures convey talk by printing heads and sub-heads. The stage depends largely on talk assisted by scenic effects, stage lighting, etc. A Radiocast station can vary modulation and the character of tone effects, interposed imitations of bells, trains, etc., to surprising advantage, once the possibilities are assembled by a Radiocasting directing genius.

Despite opinions of some in the phonograph trade, Radio is influenced by, and influences phonograph, and indeed, other forms of sound reproduction. A record conveys the music via grooves formed in a material disc. The Radio conveys the music via modulation in Radio waves. Anything suited for reproduction by records is also well within the scope of Radio transmission. For many listeners, there is a supplemental value, records affording repetition at will, while the living voice Radiocasting supplies the variety of changing interest. One or the other forms of entertainment does not go out of public favor as long as it meets public requirements. If Radio grows in popularity it must be because in a measure at least, the public is being pleased.

The entertainment value is likely to remain uppermost in Radiocasting. Next to essentials for maintaining life the desire for amusement or entertainment crowds out even supplementary necessities.

#### Economics of Radiocasting

The value of Radiocasting from a typical large station, depends on the number of listeners reached. One toll station is said to charge a fee of \$10 per minute for Radiocasting paid material, but open faced advertising is not meeting great favor with the listening public. Listeners have no great objection to the general publicity form of advertising indulged in by many Radiocasting stations and their contributing financial subscribers, but the intended effect is often spoiled by too much repetition. Sometimes this is done to an extent which listeners term "ear-sores." A Radio engineer has computed the value of fairly good Radiocasting from a large station at \$25 per minute, based on the operating cost of probable apparatus used in listener's outfits. Why waste \$25 on a lot of poor announcing or repeating advertising which loses its intended effect thereby? A Radiocasting station costing even \$50,000 annually for upkeep, amounts to less money than an average of 200,000 listeners spend for upkeep and purchase of receiving sets, so much of the economics of Radiocasting points to the value of pleasing listeners.

Even a small Radiocasting station costing as little as \$10,000 complete can count on perhaps ten thousand interested listeners. The program is the thing that counts.

Figuring a Radiocast station radiating 1,000 watts, it is evident that as few as 50,000 listeners using average loud speaking sets with possibly only 1 watt output, means that the listening apparatus power amounts to 50,000 watts, so that even on a power basis, the listeners are the important end of Radiocasting.

#### Listeners Can Vote for What They Want

Listeners can express approval or dislike for a particular program much as an audience applauds or politely withholds applause. Postcards are a common way to express opinion of Radiocasting and the average station receives thousands daily. Some stations read off favorable opinions telephoned or telegraphed to them, but this becomes monotonous as indulged in by some Radiocast announcers who seem to like themselves. Seldom do announcers read off telegrams of criticism if they get any. The main indication of a program is the applause received, and curiously enough, a good program often fails to draw deserved applause.

(The next issue will have the last of the series by Mr. Edelman. In this the author tells of new things to try, entertaining your neighbors, the Radio dance, using the neighbor's speakers, distributing programs through a building and interesting novelties for BCL's.—Editor's Note.)

#### Variable Condenser Hook-Up

Almost every Radio set has a variable condenser in the circuit somewhere. The position of the condenser depends upon the work it has to do. Of course, by that is meant what part of the circuit it is to tune, as the only use of a variable condenser, outside of using it occasionally for a by-pass condenser, is to tune some part of a set.

If a condenser is to be used in the primary circuit it is used to tune the primary coil. For local stations it is advisable to use as little capacity as possible and as much inductance as possible, in order to make the set more selective for local reception.

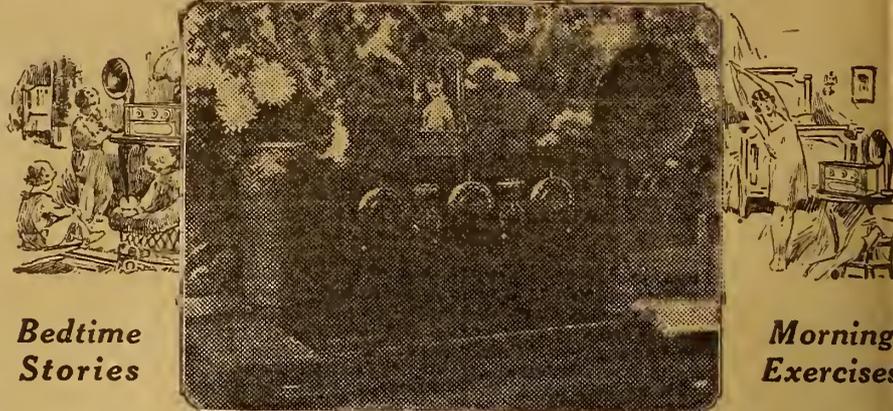
For distant stations it is best to use more capacity and less inductance. The reason for this is that by lessening the amount of inductance some of the resistance in the circuit is removed and by using more capacity its signals will be slightly stronger, due to the fact that the condenser will act as a sort of stepping device, which will hold the signals back until they can build up enough to pass the condenser.

If the condenser is to be used in the primary, then place it in the ground lead, not in the aerial; that is, from the ground post of the set to the primary coil. In general practice, if the rotary plates are connected to the ground the condenser will not be affected by the operator's hand. Sometimes, however, the construction of the condenser makes it necessary to connect the stationary plates to the ground

in order to eliminate the hand capacity effect. This must be experimented with.

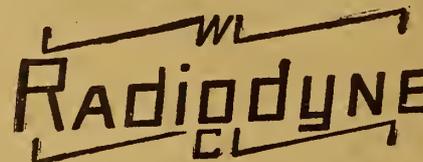
#### Concerning Condensers

Condensers that use paper as a dielectric in any circuit that needs critical tuning element, are not advised. These condensers build up and lose their capacity too much to be of any use in this position.



WHEN you own a Radiodyne the world's foremost entertainers and educators serve you. With this efficient receiving set you can bring operas, sermons, lectures, dance music, etc., right into your home clear and distinct on loud speaker, no matter where broadcasted or where you live.

Uses Light Socket for Antenna



Outside or Inside Aerial for Daytime

"I have no outside antenna. I just plug into the light socket. Picked up Omaha last Sunday morning at ten o'clock when the temperature was 95 and the sun shining."  
Frank Williams, Winona, Minn.

"Received Cuba, Canada, New York and California on loud speaker with 70 foot ribbon antenna in attic. Also have a single 75 foot wire outside for daytime, volume and distance."  
L. G. George, Fairmount, Ill.

Write for illustrated folder which describes the RADIODYNE in detail. Every radio fan will be interested in this new type receiver.

Western Coil & Electrical Co., 312 Fifth St., Racine, Wis.

### NEW MODELS

## Bristol Radio Receivers

Incorporating the Patented Grimes Inverse Duplex System

Watch for further announcements in all leading radio publications.

Improved Bristol Audiophone Loud Speakers—gives greater volume, is more sensitive and still maintains its round, full tone and its distinctive freedom from distortion.

Ask for Bulletin No. AY-3017

Manufactured by

**THE BRISTOL COMPANY**

Waterbury, Connecticut

GRIMES SYSTEM INSURES NATURAL TONE QUALITY



Senior Audiophone  
15-inch Bell  
Price.....\$30.00



Junior Audiophone  
11-inch Bell  
Price.....\$22.50

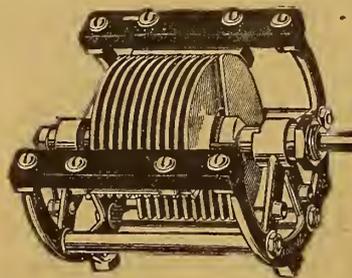


Baby Audiophone  
With Fibre Horn  
Price.....\$12.50

# BUPELL

E. J. Flewelling

## RADIO APPARATUS



THE Flewelling Condenser brought out a year ago is one of the first deserving of the name "Low Loss!" It has all the desirable electrical characteristics that insure holding the signal brought in by your antenna at its greatest strength. It gives your set selectivity. It is the heart of your set and the one place where it does not pay to economize.

This condenser has features that are being widely copied. Its heavy 1/16-inch aluminum plates will not warp. The quality of the workmanship is above usual standards. It is a piece of Radio apparatus you will be glad to own. Ideal for Super Heterodyne or other circuit.

"Hook up with Flewelling and you will have good Radio."

- 23 Plate .0005 Mfd., \$7.00, Vernier included
- 11 Plate .00025 Mfd., \$6.00, Vernier included
- Flewelling Low Loss Tuner, \$7.25
- Flewelling Sockets, 75c

## BUPELL MANUFACTURING CO.

2977 Cottage Grove Ave., Chicago, Ill.

Write for circular on our entire line



# Getting Best Results from Your Vacuum Tubes

## Correct Values Throughout Most Necessary

By Lieut. Harry F. Breckel

ONE of the most frequent sources of trouble encountered in Radiocast receivers which fail to function properly can be traced to the operator of the set failing to observe the necessity for operating the vacuum tubes on the correct filament and plate voltages and providing a grid leak and condenser of the right value in connection with the detector tube and further, in the failure to realize the advantage to be gained in using a grid biasing or C battery in the grid circuit of the audio frequency amplifier.

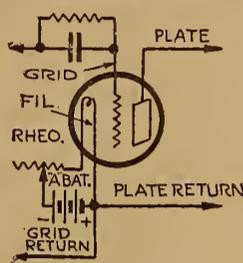
In order to get the most and best out of your tubes it is of paramount importance that the various voltage values for A (filament), B (plate) and C (grid biasing) batteries, be strictly observed (see tables on operating characteristics), and that connections of the grid and plate return leads be made as shown in the diagrams.

Another feature of importance often overlooked and which should be given careful attention is the grid leak, the value of which is usually expressed in megohms (one megohm is equal to one million ohms) and the value of the grid condenser generally expressed in microfarads, used in connection with the detector tube.

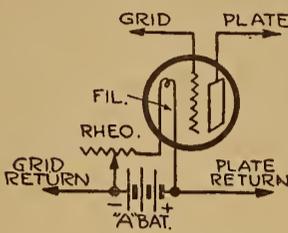
### Changes in Value Noted

When vacuum tubes are used in amplifier circuits, very small changes in the voltage or potential of the signals, as applied to them between grid and filament, have the effect of causing large changes in the value of the plate current and in order to secure the best possible reproduction of the speech or music, the grids of the tubes should not draw any electron current. Should this happen, it would have the effect of changing the value of the plate current, which would be alternately normal and less than normal, which

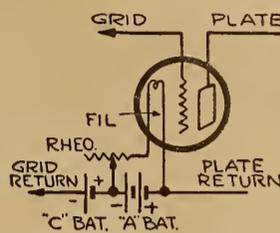
CORRECT CONNECTIONS FOR DETECTOR TUBE



CORRECT CONNECTIONS FOR AMPLIFIER TUBE USING RHEOSTAT RESISTANCE FOR BIAS



CORRECT CONNECTIONS FOR AMPLIFIER TUBE USING "C" BATTERY FOR BIASING



condition will result in the distortion of the voice or music.

To properly circumvent or avoid this possible condition, the grids of the amplifier tubes should at all times be kept at a negative value with respect to the filaments, this being accomplished by either one of two possible methods, i. e. by the insertion of a resistance, or the connection of a C battery in the grid return lead. The schematic diagram of connections for both methods are shown in the accompanying diagrams.

The selection of either method will depend on the particular type of vacuum tube used and on the value of the applied plate voltage (furnished by B battery). Where a negative grid bias of from 1/2 to one volt only is required (see table), the so-called resistance method of biasing is practical and efficient and can generally be used to advantage.

### Another Method Required

Where tubes and plate voltages are used which require the application of higher grid biasing values (see tables), it becomes necessary to use the C battery

method, the proper voltage values for which are set forth in the table and the connections for which are shown in the diagram.

Practically speaking, the voltage of the C battery should be varied in order to secure the best value to be used, as the characteristics of the individual tubes often vary, with the result that certain applied C battery potentials which provide best results with one tube, will not be satisfactory when used with another tube, even though both are of the same type.

### Selecting a Grid Leak

The proper resistance value of the grid leak used will vary, depending also on the type of tube used and again on the individual tubes themselves, even though they are of the same type. For example, grid leaks of varying values of from two to nine megohms will be found to give best results with different individual tubes of the familiar UV-201A type and in order to arrive at the best value to be used, the operator should try several values while listening to some fairly distant station, selecting the one which gives best volume

and clarity of reproduction. The accompanying table will show the best approximate values to be used with the different types of tubes, but these will vary, as before mentioned, with the individual tubes, even though of the same type.

### Employ High Grade Grid Condenser

Practically speaking, the value of the grid condenser to be used with the detector tube is approximately .00025 microfarads capacity, although some individuals prefer the use of a slightly larger capacity, when a gaseous content tube such as the UV-200 or C-300, is used.

Generally however, the value of the grid condenser should not exceed .0005 microfarads capacity and it will amply repay the constructor of a Radiocast receiver to make certain that a reliable and well designed grid condenser is used, for a faulty or cheaply constructed one has often been found to be the cause of objectionable noises in the set. And by all means, be sure to get one that is moisture-proof and which has been impregnated under pressure and further, which uses mica as the dielectric, as this type of grid condenser will entirely eliminate the possibility of the above-mentioned condition arising.

### Detector Tube Plate Voltage

The plate voltage to be used in connection with the detector tube should also be varied, depending both on the type of tube and the individual tube used (see table) and it will be found advantageous to vary the value of this voltage while listening in to some fairly weak and distant station. The writer has repeatedly observed cases where the volume of reproduction was increased fully 50 per cent by carrying out this procedure.

In the case of the plate voltage to be used with the amplifier tubes, this value is not critical and varying potentials or

(Continued on page 24)

Building your own?  
use  
DeForest  
Parts.

DE FOREST RADIO TEL. & TEL. CO., Dept. R. D. 12, Jersey City, N. J.

**\$3.75**



**Loud Speaker Phonograph Attachment**

**NEW Sales Policy**

Highest quality radio material delivered to you at from 10% to 50% reduction. Save the middleman's profit. Send for circular No. 20.

Loud Speaker Phonograph Attachment—efficient, well-built instrument. Long cord, well finished and of excellent appearance and tone.  
Special Price ..... **\$3.75**

"B" Batteries. Glass jars—not test tubes. Heavy plates. Large acid circulation. Made in two 24-volt sizes.

"B" Battery Standard. 1750 M. A. H. (1 1/2 amp. hr.) Size 4"x11 1/2"x3 1/2".  
Price ..... **\$3.60**

"B" Battery Super. 2250 M. A. H. (2 1/4 amp. hr.) Dimensions 4 1/2"x13 1/2"x6". Price..... **\$4.75**

"A" Battery. 6 volt full 100 amp. hr. capacity. Made for radio work. 2, 4 and 6 volt taps. Has handy carrying handle. Finished oak case.  
Price ..... **\$13.90**

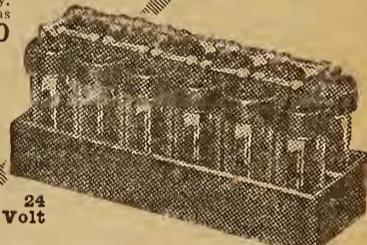
**Special Offer!** 10% discount allowed on orders for \$15.00 or more. Send 25¢ of price with order, balance C. O. D. All storage battery prices F. O. B. Cleveland. This is your opportunity to make a big saving on all radio supplies. Send your order today.

Send for Our Radio Circular No. 20

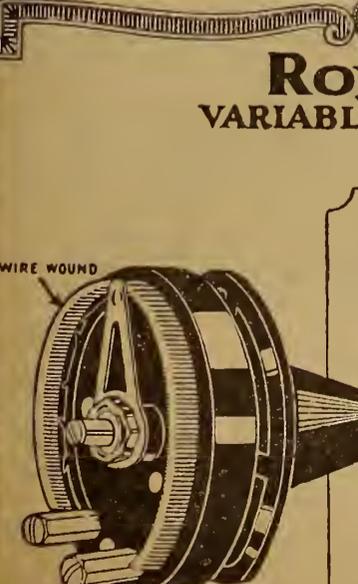
**FOREST CITY SALES CO.**  
1400 West 25th St., Cleveland, Ohio

**"E" Battery Super**

**\$4.75**



24 Volt



**ROYALTY VARIABLE GRID LEAK**

**REVOLUTIONARY!**

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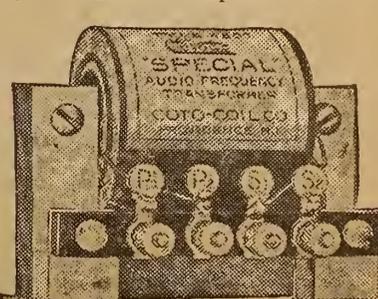
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**RESULTS FROM TUBES**

(Continued from page 23)

voltages of from 45 to 120 volts can be employed, although, practically speaking, it will be found that best all-round results will be obtained with a voltage of from 60 to 90 volts for loud speaker work and from 45 to 60 volts when the head phones are used.

**Adjusting Filament Control Rheostat**

Too much stress cannot be laid on the necessity for careful adjustment of the tube filaments through the proper manipulation of the filament control rheostat, as not only the volume but also the clarity of reproduction is vitally dependent on this operation. And never, by all means, burn the filament any brighter than is necessary to reproduce the voice or music of the Radiocast you are listening to, with the best volume possible, consistent with good clarity, as the observance of this precaution will not only give you the best results, but it will greatly prolong the working life of your tubes. And further, be certain that you are using the proper applied filament voltage and the filament control rheostat of the correct resistance value in connection with particular type of tube you are using (see table).

Where possible, it is a good plan to incorporate a small voltmeter or ammeter in the tube filament circuit of the set, either being inexpensive and the use of which will enable the operator to operate the tube filaments at constant voltage or constant current values (the former preferable) to further safeguard their working life.

**Remove Tubes When Making Connections**

As a further precaution for the protection of the tubes from a burn out, caused by accidental application of the high voltage B battery leads to the filament circuit, it is recommended that all tubes be removed from their respective sockets until all connections are completed and in the case of a set which has just been completed by the layman, extreme care should be taken to trace out the plate and filament circuits, in order to make certain that they are correct before making any connections of the batteries thereto. This precaution, if observed, will in many cases save the expense of a new set of vacuum tubes.

By proper observance of the foregoing simple precautions and the careful studying of the table of operating characteristics and accompanying diagrams, the broadcast listener is sure to get the most

"OPERATING CHARACTERISTICS OF VACUUM TUBES"								
Type	Filament Battery Voltage	Filament Current	Filament Rheostat	Plate Voltage		Grid Leak Resistance	Grid Condenser Capacity	
				Detector	Amplifier			
UV-200 C-300	6	.9 to 1. amperes	4 to 10 ohms	16 to 22½ volts	(Detector only)	½ to 2 megohms	.00025 to .0005 mfd.	
UV-201A C-301A	6	0.25 ampere	10 to 30 ohms	18 to 45 volts	45 to 120 volts	2 to 9 megohms	.00025 to .0005 mfd.	
UV-199 C-299	4.5	0.06 ampere	20 to 30 ohms	18 to 45 volts	45 to 100 volts	2 to 9 megohms	.00025 mfd.	
WD-11 WD-12 C-11 C-12	1.5	0.25 ampere	10 to 30 ohms	18 to 45 volts	45 to 100 volts	2 to 3 megohms	.00025 mfd.	

"PROPER VALUES OF "C" BATTERY TO USE FOR GRID BIASING"									
Type	Plate Voltage	Grid Bias Voltage	Type	Plate Voltage	Grid Bias Voltage	Type	Plate Voltage	Grid Bias Voltage	
UV-201A C-301A	45	0.5 to 1.0	UV-199 C-299	45	0.5 to 1.0	WD-11	45	.....	
	65	1.0 to 3.0		65	1.0 to 3.0		WD-12	65	0.1 to 1.5
	90	3.0 to 4.5		90	3.0 to 4.5		C-11	90	1.5 to 3.0
	110	4.5 to 6.0		110	4.5 to 6.0		C-12	110	3.0 to 4.5
	130	6.0 to 9.0							

and best results out of his tubes, with a consequent greater satisfaction in the performance of the receiver used, for the factors—clarity, distance and volume—depend vitally on the correct functioning of the vacuum tubes in the various circuits wherein they might be employed.

**Holes Improve Loud Speaker**

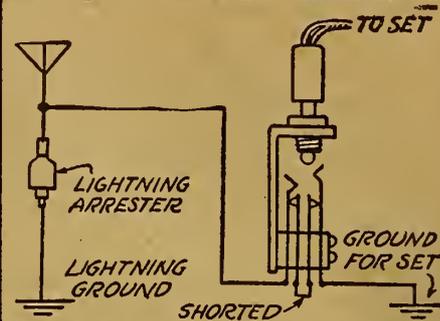
An original suggestion comes from an amateur in southern France regarding the improvement of a loud speaker if the effects of resonance are too marked in the horn. Some loud speakers are inclined to accentuate certain tones above others, thus ruining an otherwise perfectly good transmission.

The way to diminish this trouble, says the investigator, is to pierce holes along the length of the horn; at the half-way

point, the quarter-point, and the eighth-point, distances being measured outward from the narrow end of the horn.

**Plug Connection for Aerial**

The practical fan does not care to leave his set connected to the aerial even though the system is equipped with a lightning arrester. An efficient and simple arrangement for connecting, disconnecting and grounding a set may be constructed from a double circuit jack by shorting the two center terminals and



connecting the aerial to one of the outside terminals and the ground to the others. Two flexible leads from the set equipped with a plug completes the arrangement. By removing the plug the aerial is automatically grounded. The jack may be conveniently mounted on the table or other suitable place.—H. E. Mase, Minneapolis, Minn.

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While the aerial is loose and sways in the wind you cannot expect to get good reception. The best way to keep it taut and yet prevent it from snapping is to hold it to the masts by a pulley and heavy weight arrangement.

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- NO STORAGE BATTERY**—Very efficient with all dry battery tubes.
- UNUSUAL VOLUME**—Louder with one tube than most regenerative sets are with two.

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# Amplidyne Type Radio Frequency Amplifier

## Part I—New Method of Neutralization

By Thomas W. Benson

TODAY finds the up-to-date Radiophan deep in the intricacies of Radio frequency amplification, wading around in a maze of conflicting claims and confusion theories. On every hand we find superdynes, neutrodynes, ultradynes and what not. The announcement of the neu-

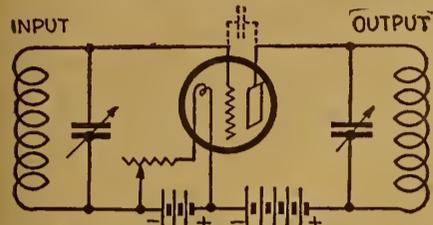


Figure 1.—Cause of feedback resulting in oscillations in a tuned Radio frequency amplifier.

trodyne apparently heralded a new era in Radio, but when it was all considered we find the neutrodyne simply a compensated tuned Radio frequency amplifier.

### Straight Tuned Radio Frequency

The reason for such compensation is

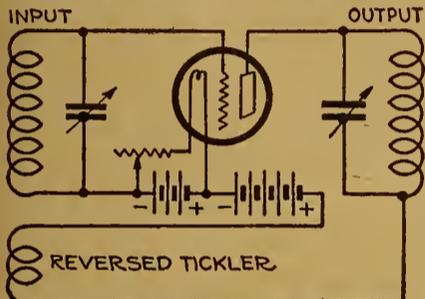


Figure 2.—The superdyne method of neutralizing oscillations in the amplifier.

very well known to those who have tried to use straight tuned Radio frequency amplification. They found that tuned ampli-

fication was far superior to transformer coupling, but the difficulty was in keeping the circuits from oscillating. The reason for this oscillating is not hard to locate. Consider the circuit shown in Figure 1. Here is shown the essential circuits of a stage of tuned Radio frequency amplification. When we tune the grid circuit to the incoming signals and then tune the plate circuit it is very apparent that part of the energy in the plate circuit will react on the grid by reason of the capacity existing between the plate and grid represented by the dotted lines. This is the principle of the three circuit tuner or the tuned plate regenerator and whenever resonance exists between the plate and grid circuits of a tube there is going to

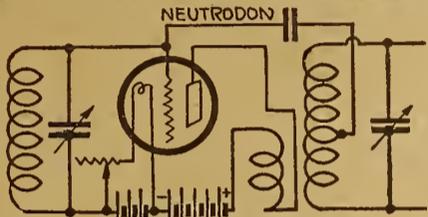


Figure 3.—The neutrodyne method of neutralization.

be a feedback which if great enough will cause regeneration and oscillation.

Such regeneration is found in transformer coupling but not to as great an extent as in tuned frequency coupling. The oscillations are prevented to a great extent in transformer coupling by using iron core transformers and winding with high resistance wire. This is accomplished at the expense of the amplification, hence transformer coupling has a low efficiency.

When regeneration is caused by tube feedback it has been the practice to add a "losser" to the circuit. That is, include a resistance in the grid circuit to absorb the energy or to bias the grid by means of a potentiometer. Either of these methods are inefficient for they cut the am-

plification by increasing the resistance of the circuits. Furthermore, as the grid

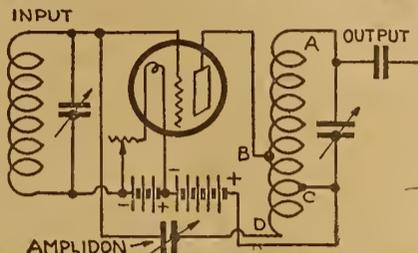


Figure 4.—The amplidyne method of neutralization.

bias voltage is changed it leads to distortion or detection in the amplifier tubes.

### Neutrodyne Method

The introduction of the neutrodyne method of controlling feedback came as a

great innovation despite the fact that it is by no means new. Methods of preventing regeneration in cascade Radio frequency amplifiers by use of compensating feedbacks were known and used over eight years ago. The so-called superdyne circuit shown in Figure 2 accomplishes it by using an inductive negative feedback. This is simply a tickler coil as used in regenerative circuits with connections reversed so it prevents instead of causing oscillations. Since this circuit balances a capacity feedback with an inductive feedback it is necessary to change the tickler for each change in wave length. Despite this seeming disadvantage the circuit is a wonder for long range work and gives great selectivity, utilizing Radio frequency amplification in a really efficient manner.

The neutrodyne system balances a capacity feedback against the tube feedback and apparently works effectively at (Continued on page 26)

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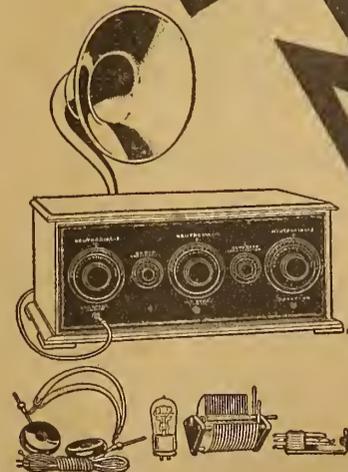


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### R. F. AMPLIFICATION

(Continued from page 25)

all wave lengths. The principle of this circuit is shown in Figure 3 which shows but one neutralizing condenser. Use is made of an aperiodic primary inductively coupled to a secondary coil having a tap taken off it. This tap is connected through a small fixed condenser to the grid of the tube. The theory of operation is disputed to some extent but the best explanation is that with every change in plate potential tending to act upon the grid of the tube there is an equal and opposite potential acting through the neutralizing condenser that effectively neutralizes the effect of tube reaction. In this manner the circuit is stabilized and oscillations do not occur.

#### Neutralizing Circuit

Since the neutralizing current is opposite in phase to that in the plate circuit two coils in the neutroformer must be connected in the circuit so the current flows in opposite directions. Furthermore for perfect neutralization the voltage in the two coils must be equal but to accomplish this the coupling between them must be unity or 1. This cannot be accom-

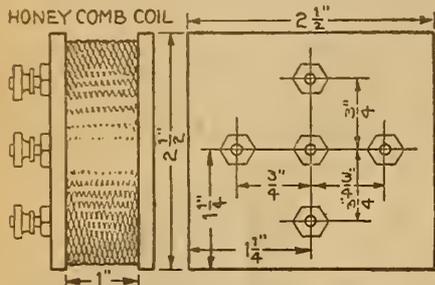


Figure 5.—Construction and mounting of the amplifier.

plished without winding the wires of the two coils side by side and were this is done the capacity coupling between them would be excessive when the coils were connected into the circuit. For that reason the neutrodyne is not perfectly balanced at all frequencies and it is not possible to fully realize all the advantages of this circuit.

With the belief that the inherent defects in the several systems of neutralizing could be partially or entirely eliminated the writer experimented with several forms of regeneration contro, with the evolution of the Amplidyne circuit. The principal of this new circuit is shown in Figure 4. The coupling inductance is a single winding properly tapped and offers several advantages over the neutrodyne both as to signal strength and selectivity.

It will be noted that the single inductance is tapped at two equidistant points from the lower end. The plate current flows through this winding from C to B, making the plate circuit aperiodic and reducing to some extent the tendency to feedback through the tube. This plate coil forms a part of the inductance A to C and thus we get close coupling or a high efficiency in the transfer of energy from the plate circuit to the circuit of the next tube. Note further that the inductance C to D is equal to that C to B and we will see that the potential at D is equal to that at B, and any tendency of

the plate current to feedback to the grid through element capacity is neutralized by the current through the variable condenser connected between D and the grid. This neutralizing condenser can be fixed in value but it is to an advantage to make it variable for it assists in tuning and the signal strength can be increased by a slight adjustment that puts the tubes on the edge of oscillating.

Working on this principle the writer has succeeded in constructing several sets that have proven very successful and superior to any neutrodyne he has handled.

#### Amplifiers

The method of constructing the amplifiers and mounting them are both original and found perfectly satisfactory. The amplifiers are constructed as follows: Take a 75 turn honeycomb coil and strip off two turns. Carefully count back fifteen turns, raise the wire carefully with a pointed tool and make a tap soldering the connection. Now count back fifteen more turns and make another tap. These taps as well as the beginning and ending of the coil are brought inside the coil by punching a hole through the supporting tube between the crossed wires and pushing the leads in.

This completes the amplifier proper, it is important that the taps be correctly marked and the connections followed carefully. The beginning or the inside end of the honeycomb is indicated by A. The second tap taken is B, the first tap taken is C, while the outside end of the coil is D. To complete the amplifier cut two pieces of bakelite 2 1/2 inches square as shown in Figure 5, and drill holes for the center holding screw and for the four terminals. Attach the wires from the coils to the terminals and clamp the coil between the two pieces of bakelite by a long screw through the center. Mark the terminals plainly so no error will result while connecting up.

This unit can be used for a great number of purposes but in the following articles the construction of a five tube Amplidyne will be described and other applications of the amplifier may be taken up later.

(In the following issue Mr. Benson will give the circuit for the Amplidyne set together with the stabilizing condensers.—Editor's Note.)

### Review of Books

**Home Radio—How to Make It.** By A. Hyatt Verrill. This book is particularly adapted for the amateur who desires to know how to make Radiophones. Twelve

full page illustrations and diagrams. Price, 75 cents.

**Radio for the Amateur.** By A. H. Packer and R. R. Haugh. The underlying principles of Radio thoroughly explained in simple language and understandable illustrations. This book will teach you how to construct and operate a receiving set successfully. Price, \$1.50.

**Radio Reception.** By Harry J. Marx, Technical Editor Radio Digest Illustrated, and Adrian Van Muffling. A simple treatise on Radio reception. Beginning with the elementary principles of electricity it carries the reader on into the essentials of Radio telephony. The most successful methods of Radio reception are explained and special attention given to practical tuning. Price, \$2.00

**Elements of Radio Communication.** By Ellery W. Stone. A splendid, well connected, complete, accurate and up-to-date discussion of every place of Radio telegraphy and Radiotelephony. Written in simple language. The subject is presented from the physical rather than from the mathematical standpoint, avoiding the use of higher mathematics. Price \$2.50.

**Within the Atom.** By John Mills. May be read by the Radiophan with interest for it deals with that infinite particle as associated with electrons and all chemical and all electrical phenomena. Price, \$2.00.

**Experimental Wireless Stations.** By P. E. Edelman. Simple directions are given in this book for making Radio equipment for the transmission of messages over long distances. Price \$8.

**How to Retail Radio.** A new book telling of tested plans and methods and policies for the dealer in Radio. Financing, location store equipment and arrangement. Price, \$2.

**The Radio Manual.** By Orrin E. Dunlap Jr. A 268 page book profusely illustrated. Tells of Radio from the beginning to the end in non-technical terms. Price, \$2.50.

**Storage Batteries.** By George Wood Vinal. Any person owning a Radio receiving set needs this book for it tells about the power that brings in the messages. Most of us know too little about the heart of the set—the storage battery. Price, \$4.50.

**Vacuum Tube Receiver.** By O. F. Hessler. A book that tells how to make a simple set. How to make the cabinet. It includes a 27 by 36-inch layout blueprint. Price, 75 cents.

**The Radio Amateur's Handbook.** By A. Frederick Collins. A new revised edition of this book is just out. It is a complete authentic and informative work on Radio. Fully illustrated. Price, \$1.50.

**The A. B. C. Vacuum Tubes.** By E. H. Lewis. It is a book for beginners who

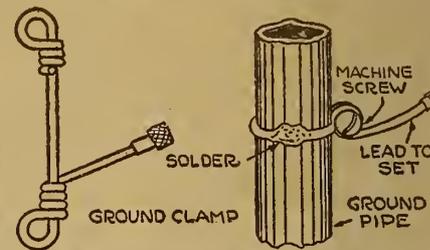
have no knowledge of either Radio or electricity and sets forth the elementary principles of theory and operation of the vacuum tube. No attempt has been made in this book to describe all the possible circuit arrangements, but those shown may serve as suggestions to experimenters who desire to evolve their own circuits. Price, \$1.00.

**Ideas for the Radio Experimenter's Laboratory.** By M. B. Sleeper. This book tells in a simple way the how and why of Radio apparatus. Comprehensive data are given on such necessary laboratory instruments as the oscillator, wavemeter, direction finder, Radio compass, vacuum tube, characteristic measuring set and detailed advice given on the winding of various kinds of standard inductance coils. Price, 25 cents.

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### Wire End Makes Ground Clamp

The illustration shows a way to make a clamp on the end of a groundwire. Scrape the wire and clean and twist it to form a small loop so that a small ma-



chine screw may enter easily then twist it around the ground pipe one or more times, make a loop in the other end as shown and run a small machine screw through the loops and draw it up tightly and solder it on one side so as to make a permanent contact.—George Starke, Detroit, Mich.

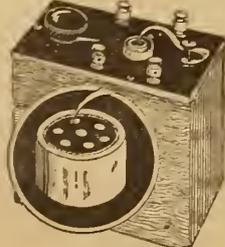
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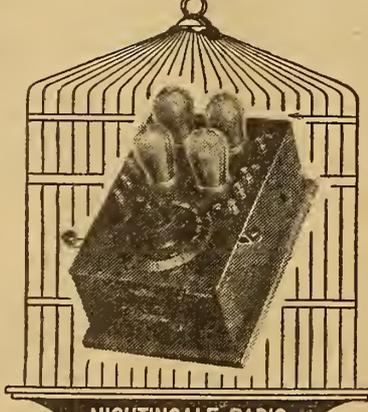


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# Making the Popular Mica Fixed Condensers

By Edward R. Doyle

**D**URING the past year at least five million fixed condensers were used by Radio manufacturers and Radio-phans in building Radio sets. This represents, therefore, a basic product which is highly essential in every Radio circuit.

If we named the uses for fixed condensers, we would find a summary as follows: Audio frequency by-passes; Radio frequency by-passes; grid condensers; tuning condensers for fixed wave length circuits; neutralizing condensers; wave length shortening condensers; transmitting condensers and filter condensers.

Unquestionably, the largest number of fixed condensers are used for detector tubes, where the condenser and leak are an essential part of the circuit. The next greatest number probably go for phone condensers, with the fixed condenser used across the primary of the first audio transformer as a good third.

There are any number of special circuits which use a large number of fixed condensers. The super-heterodyne, Flewelling, super-regenerative and many reflex circuits. In one circuit of a rather complicated character which the writer built, there were no less than thirty-two fixed condensers varying in value from 25 mfd. to 1 mfd. The more exacting the circuit and the results which the builder intends to secure, the greater the temptation is to use a larger number of fixed condensers.

Fixed condensers are practically all built up by alternate sheets of metallic conductors separated by some insulator, such as paper, mica, fibre, etc.

The process by which the fixed mica condenser is put together affords an interesting story and in knowing how a condenser is manufactured some light may be shed upon the various qualities of these standard units.

### Paper Condensers

Paper condensers, so called, are now gradually passing out, for the simple reason that the paper and the foil are simply rolled around a strip of cardboard or pressed fibre and are held together by simply pasting a piece of paper around this bundle, which usually looks like a stick of chewing gum.

This process has permitted the manufacture of very low priced units and everyone is familiar with the 10 cent paper condenser which, despite its obvious limitations, is useful and has done its part in affording Radio at low cost.

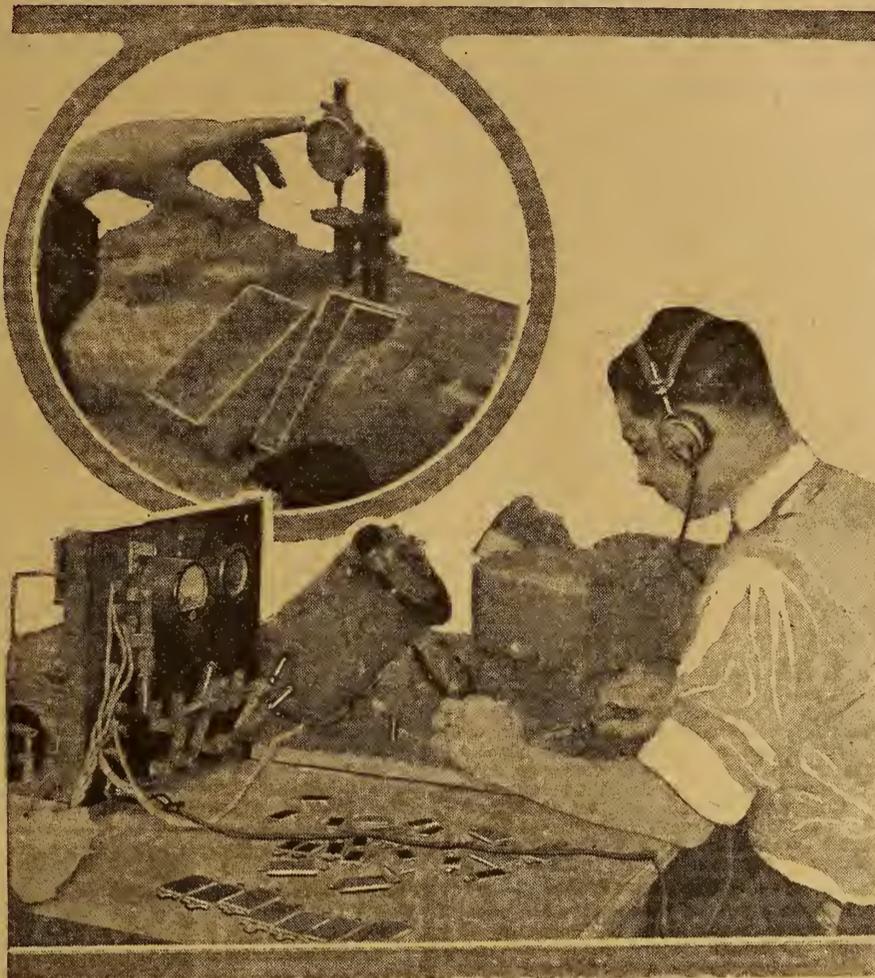
The great difficulty with the paper condenser has always been that the capacity ratings were far from accurate, paper being loose and exposed to the air has a variable leakage and the losses across such condensers have been rather high. Nevertheless, the economy of the paper condenser is so great that it enjoys a wide market and will continue to do so.

In making more efficient fixed condensers, the main problems involved are: To secure compactness; to secure accuracy of rating; to prevent variation of this rating; to reduce losses; to avoid mechanical injury and to afford convenience.

### Mica Condenser

Practically all the better types of fixed condensers use mica as the dielectric or insulator between the alternate sheets of metal which form the opposing plates. Mica is mined as a peculiar slate formation, coming packed together in very fine sheets. It has remarkable insulating qualities and is exceedingly strong in resisting high potentials. Its specific inductive capacity is unusually high and because it is absolutely non-hydroscopic it is ideal for condenser purposes.

In using mica, however, variation in thickness of different sheets introduces a problem in standardizing the ratings ob-



Above photo shows method of testing condensers.

In the photograph will be seen a special micrometer gauge which is used by a mica inspector or sorter. Here, after the mica has been cut into the proper shape, every individual piece of mica is placed under the micrometer and its thickness noted. All pieces coming within a certain thickness are placed in a given tray so that in the course of testing thousands of strips of mica it will be found that they are graduated into probably ten or more major thicknesses.

### Thickness of the Mica

Fortunately, for a given sheet of mica the thickness is practically uniform unless it is only partially split, that is, mica comes in layers, the average thickness being about .001 to .002 inches. After the sheets have been roughly trimmed they are then peeled and graded with a special effort toward economizing on waste, because mica is very expensive.

You all know that if you bend a piece of mica the sheet will have a tendency to break up into sub-layers, but normally the raw mica easily breaks into the thickness referred to and does not normally yield but so many thousand sheets per foot.

Getting uniform capacity cannot be attained if the alternate sheets of metal or foil are loosely spaced. It is absolutely essential that the severest pressure be applied when the unit has been assembled, and by special jamming the plates are pinched permanently into position.

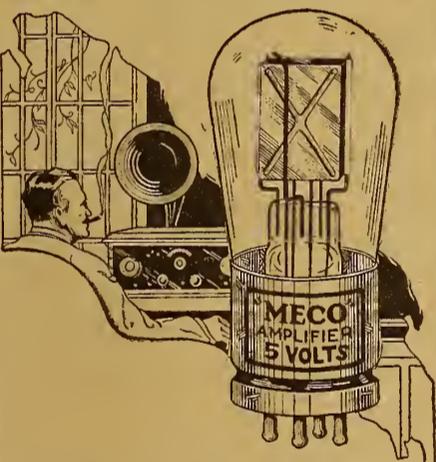
Two or three different styles of compression are being used under existing patents.

### Types of Construction

In one case, metal pieces are bent over the edges of the built up mica and metal (Continued on page 28)

tained after the unit has been assembled. Every reader knows the capacity of a condenser varies with the thickness of the

dielectric between the plates, so that 1/1000 inch more or less will vary the capacity accordingly.



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### FIXED MICA CONDENSER

(Continued from page 27)

plates and heavy strips of bakelite are used to face off each side of the unit. The metal ends are now jammed hard by a press which holds the bakelite firmly against the mica and the metal.

Another manufacturer uses metal on one side and then builds up the alternate sheets of mica and conductor and faces this off at the other end with one piece of bakelite board. The edges are now jammed and this exerts a pressure on the unit.

Still another method of fixing the pressure positively and equally is the use of a metal pipe of brass which is almost flattened, allowing just enough space for the built up condenser elements to be inserted. After they have been set in position a very heavy press puts several tons pressure on the containing sleeve, which is of such heavy metal that the pressure is practically permanent and is evenly distributed across all parts of the built up unit.

Whatever the method of applying this pressure, it is obvious that for permanency and accuracy rather heavy materials must be used and there is no way of avoiding this.

Another step in the making of a good fixed condenser is in making it absolutely protected from the air and any moisture which might be introduced into the condenser by changes in climatic conditions. In one type of condenser, after the contained form has been jammed tight, the condenser is placed in a boiling vat of paraffine and treated under an extremely high vacuum. By this process the paraffine boils out any traces of moisture which may exist between the built up elements and wherever a bubble of air may exist it is quickly forced out and the paraffine takes its place, with the result that the unit is absolutely sealed permanently.

#### Contacts for Plates

Another difficulty which enters into the making of a good fixed condenser is the necessity for making a real positive contact to the alternate metallic plates. In most instances, this cannot be done by soldering, due to the fact that the foil used is very thin and is easily burned away by the application of heat. As a general thing, contact is depended upon through the pressure applied either to the sheets of metal or foil by pressure plates, or by the special jamming process applied to the sheets alone.

Here it may be well to point out that it is very undesirable to apply much heat in soldering a fixed mica condenser. Many an amateur assembling his set ruins the fixed condenser by applying an unusual amount of soldering flux and soldering directly on to the condenser ends, with the result that there is a tendency to short circuit the plates.

One manufacturer avoids this difficulty by providing punched eyelets, through which screws and nuts can be placed and soldering lugs attached to these. An even more ingenious system has been to jam an eyelet with a three horned soldering piece of very light metal so that very little heat is needed to flux the solder and make the connection.

#### Testing and Rating

One of the most expensive processes in the making of fixed condensers is the testing and rating. In the photograph will be seen a test system in operation. Under this system a pressure of 5,000 volts is applied to the condenser, at the same time that the capacity is measured on a bridge. The operator can pass accurately as many as sixty condensers a minute. Should the condenser show a rat-

ing below its intended value he throws it into one tray. If it is accurately rated it is passed to the stencil tray, and of course, if it is over the capacity it goes into a third tray. Probably one out of every ten condensers is above or below, despite the fact that the mica measurements are all carefully made the pressure applied is almost uniform. However, slight variations of one kind or another are sufficient to change the capacity appreciably.

After the condenser has been tested for voltage break down, which would show up immediately by a deflection of the volt meter, and has also been accurately rated, it is then ready for the marking bench where the rating stamp is affixed.

From the time that the various elements of the condenser are first brought into the factory until the manufactured condensers are packed in boxes ready for shipment, there are any number of difficulties which can arise. These problems are, of course, the usual routine of worry which go with the making of any exacting unit, but unless the utmost care is exercised many defective condensers will be shipped out.

It costs money to protect the public and to maintain a reputation for accuracy and high quality. In this respect price does not always tell the story, for the volume of production is often a big factor in permitting an unusual refinement in manufacture.

Strange as it may seem, there are only a few manufacturers of fixed condensers in the United States who specialize in making these units for Radio work. In the telephone field there are probably eight or nine companies making certain types of fixed condensers, most of which are of the paper and foil design and are sealed in metallic cartridges. From the telephone service there has recently come a design of paper condenser for large capacities, usually being mounted inside of a tin container and requiring quite a little bulk. A good many concerns have endeavored to find a special grade of paper for this type, which will be extremely thin in order to secure compactness, and at the same time have a very high insulating strength.

#### Special Condenser Paper

The best grade of this particular paper seems to be found only in Germany, although American paper mills have recently developed a special condenser paper which is practically as good, but which cannot be produced in this country as cheaply as the German paper can be imported.

In fact, some American condenser manufacturers are now importing German made units and putting these under their own label. While the supply cannot be depended upon, the prices are very attractive, the only draw back being that without exception the quality of the finished unit is not as good as the American made type, and the ratings are very erratic.

The next time you drop into your Radio store to buy a fixed condenser you can serve as a better judge of these units if you have noted the principle points at which such condensers may be judged. You can test their break down strength across the line which supplies your lighting power but in doing so you should be a fairly good electrician to avoid getting

a bad shock yourself. A paper condenser generally will not stand up under 110 volts which is the standard pressure.

There is also a noise test which you can make by putting the condenser in series with a pair of phones across a ninety volt B battery. If there is leakage or a tendency to vary under this voltage due to heating effects, it will generally be noted in the phones, provided they are sensitive enough.

You can also test the stability of a condenser under varying climatic conditions by putting a fixed condenser in series with your aerial and tuning in a given station which is just far enough away—probably about ten miles for a 500 watt station—to give a sharply tuned calibration and noting the exact points on the dial where the station came in, then picking out a nice damp day with all conditions just the same as they were when the calibration was first made, and if the dial setting now varies more than one point to bring in this same station, the chances are that the moisture has gotten into the condenser or some damp air has caused the different elements to alter the capacity.

#### Measuring Losses

Generally speaking, rather delicate electrical measurements are required to measure the losses and exact capacities of fixed condensers, and for that reason many people and even many Radio experts hold preferences for certain types of fixed condensers without really knowing whether they are better or not.

A certain authority on Radio was recently asked which of two standard fixed condensers he preferred most. He explained that one type seemed to be better particularly for his work, because it was not as heavy as the other and for his receivers he preferred very light bus wiring so that in moving a set about the weight of the wire would not tend to break off at the soldered connections. He felt that one condenser was heavy enough to make a serious load on the bus wiring and for that reason he did not like it as well as the lighter type.

As a matter of investigation, the two

condensers were put on a letter scale to actually see which weighed the most and it was found that the one which this authority had thought the lightest proved to be heavier than the other, so that as long as even experts pick their fixed condensers on guesses the better made condensers may or may not be properly recognized.

#### Condenser of Twisted Wires

The latest development in small fixed condensers is to twist two insulated wires around each other and thus to secure a very small capacity. Every so often this same discovery is put forward by ingenious Radio inventors, but for any critical circuit let the home builder beware of the twisted wire condenser for it varies in capacity with extraordinary changes from minute to minute, and is far from being a satisfactory way of getting a small capacity. Every once in a while also some expert comes forward with a way to build your own fixed condensers, showing on paper at least, working plans whereby you can save as much as 30 cents by putting in three or four hours of tedious labor and at the end you will not know exactly what capacity you have, without the use of fairly accurate apparatus which may cost you \$30.00 or more.

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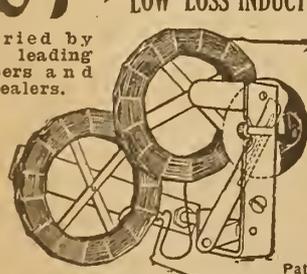
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RADIO KINKS DEPARTMENT,  
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510 North Dearborn St., Chicago

more selective hook-up. The circuit which I am about to describe is very selective, reradiates very little, and gives good volume. When built in a cabinet this set greatly resembles the neutrodyne, but a slight glance at the circuit is sufficient to show that it is altogether different.

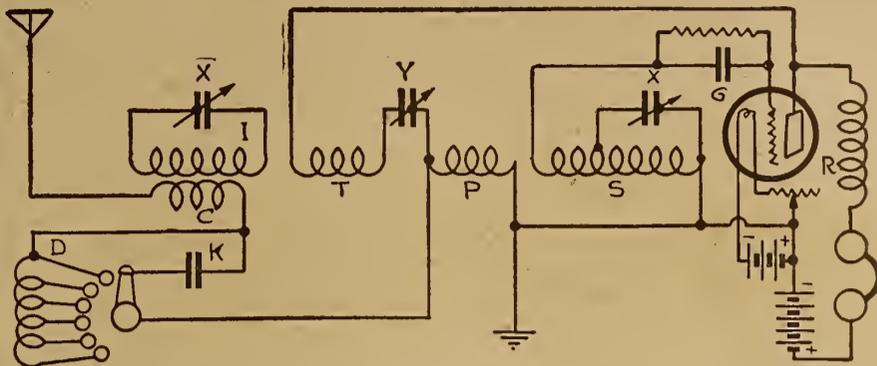
This circuit was devised after several months of extensive research and experimentation and combines properties of the Reinartz and Cockaday circuits together with a wave trap. While the sight of three dials upon the panel may cause many a person to say that the circuit is hard to tune, this is not so for it is very simple to tune.

The circuit is comprised of seven specially wound coils, all wound on a 3-inch tube with a space of 1/4 inch between coils. Coil C is 10 turns of number 22 dsc., wound directly over the top of coil I. This is known as the coupling coil. The detuning coil D is 50 turns number 24 dsc., tapped at every tenth turn and wound on a 3-inch bakelite tube. This coil should be placed at right angles and well away from all other coils. The Radio frequency choke coil R is 75 turns number 24 dsc., wound on a 3-inch tube and should be placed well away from all other coils. The impedance coil I is 40 turns number 24 dsc., while the tickler coil T is 10 turns. The primary inductance P is made up of 17 turns and the secondary inductance S is made up of 68 turns, tapped at the seventeenth turn from the grid end of the coil.

The condensers that are used in this set should be of the low loss type, while the fixed condensers should be of the mica dielectric type. The variable condensers X are of .0005 mfd. capacity, while Y is of .0025 mfd. capacity. The fixed condenser K is of .0001 mfd. capacity, while G is the standard .00025 size shunted by a 1 megohm grid leak. The rheostat should be of the vernier type and the B battery should be variable in steps of 1 1/2 volts from 16 1/2 to 37 1/2 volts. To obtain this variable voltage two 7 1/2-volt C batteries should be connected in series with the standard B battery.

Just a word about the tuning. The condenser X across the secondary S controls the wave length and is the main adjustment. Y controls the capacity feedback and is fairly critical in adjustment.

## HOOK-UP REQUIRES SPECIAL COILS



Condenser X across the impedance coil I is used to cut out interference as is the switch lever controlling D. When efficient condensers, coils, and wiring are used this set gives excellent results on the Radiocast waves and I do not see any reason why it should not do so on amateur waves especially with smaller coils. On account of insufficient time this set was not tested on amateur waves, but it was found that different size aerials made little or no difference in the tuning of the set.—Kenneth G. Alley, Carthage, Ill.

### Simple Efficiency Test

A simple method of testing aerials, grounds, condensers and other Radio parts is to take advantage of the fundamental of regeneration. It is well known that the object of using regeneration in a receiving set is to overcome the resistance of the circuit. To test various parts it is necessary to have a three-circuit tuner and a constant supply of filament and plate potential and current. It would be of course preferable if one stage of audio

frequency were used with the secondary of a second transformer connected to a crystal detector and a microammeter, but that is expensive and can be eliminated. To find out whether any Radio part, aerial or ground has more losses, or less, than that which is now being used, tune the set to a station just below the oscillating point. Record the variometer setting. Then substitute the new part for the old one and again tune in the same station and note the variometer setting. If this last reading is higher than formerly then the new part is worse than the old one. If the reading is lower then use the new part, as it is better.

### A Tip Worth Knowing

Some circuits utilize a secondary coupling coil that is placed in inductive relation to the plate variometer. This coil should be wound in the same direction as the windings of the plate variometer.

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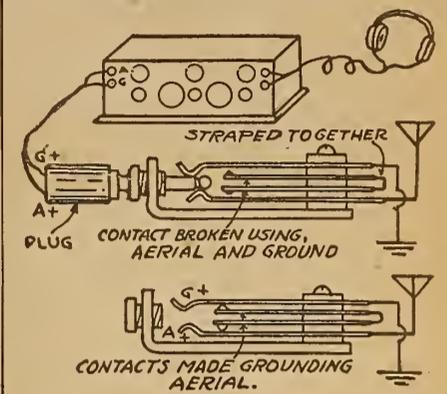
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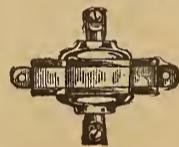


Such a connection provides a means for grounding the aerial when the plug is pulled out.—J. W. Mattox, Cincinnati, Ohio.

## Care Eliminates Need of Binders

Shellac should never be used as a binder. It greatly increases the distributed capacity of the coil, with resultant losses. In fact, no binder should be used. If a reasonable amount of care is exercised and the turns are wound tight a binder will be unnecessary.

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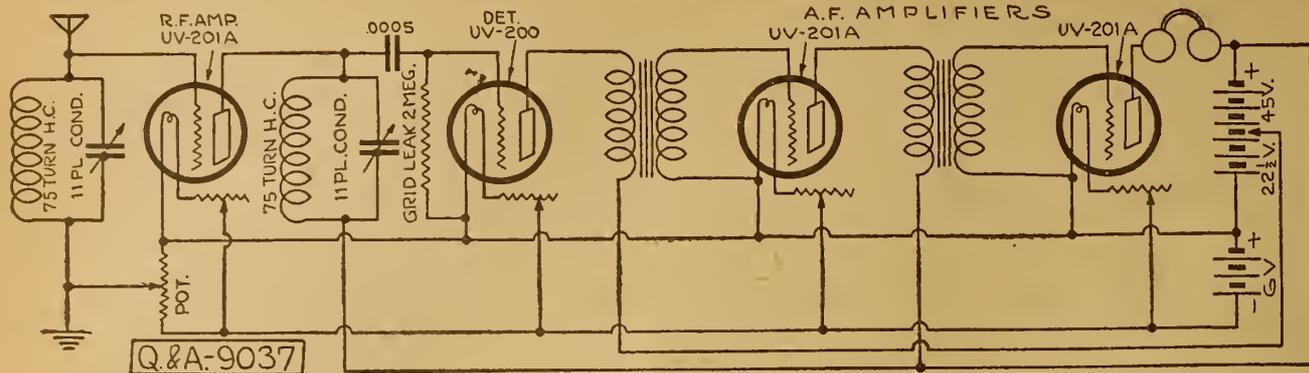
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# Questions and Answers



### Four-Tube Circuit

(9037), OJB, Cleveland, Ohio.  
I am submitting a hook-up of a four-tube circuit that does not work well. I tried various transformers but can only receive local stations on this set very loud and clear. My aerial is O. K. and also my batteries. Please tell me how I can receive out of town stations with this set?

A.—We are presenting on this page a diagram of tuned Radio frequency, detector and two audio frequency amplifier circuit conforming to the diagram you submitted. This circuit is simple and easily tuned. It will be found to afford sharp tuning and is apparently capable of reception of long distance stations even through local broadcasting.

The design of the circuit is but one part of the problem. Your construction and your operation are two additional factors. Possibly your present limitations are merely due to unfamiliarity with the circuit and its characteristics and lack of sufficient experience of properly tuning same. This can be overcome only through patience and experience and, of course the necessary knowledge of underlying principles to properly operate the controls for DX reception.

### Loop Aerial Use

(8913) KGR, St. Louis, Mo.  
I have a single-circuit regenerative set with two stages of audio amplification. My aerial consists of a single wire running from my garage to the front of my residence, 100 feet, then the lead-in runs back to the rear of the house at an angle of 60 degrees and then into the kitchen. Lead-in is approximately 50 feet. The aerial is about 22 feet high and crosses over two sets of electric light wires. By running the wire from the rear of garage to the rear of the house I could get one wire about 80 feet long.

With one tube I can get local stuff at nearly loud speaker volume, but cannot get anything distinguishable from a distance. With the two stages audio connected I have gotten New York, Schenectady, Lockport, Minneapolis, and as far southwest as Houston, but the signals will be good and strong for a while and then either fade away or the set will howl.

### PATENT ATTORNEYS

PATENTS. Booklet free. Highest references. Best results. WATSON E. COLEMAN, Patent Lawyer, 644 G Street, Washington, D. C.

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I do not want to go to the expense of making a large set so I can use a loop, but I had in mind building a large loop in the entrance to the basement. By using the side walls I could build a loop about 6 foot by 6 foot, or by going around the passage way at the top I could make an oblong 3-foot ends by 6-foot sides. Could I get satisfactory results from a loop of this kind? How many turns of wire would I have to use? What size wire? Or would you suggest using the outside aerial 80-foot in length?

A.—With the type of receiver described you would not accomplish satisfactory reception with any loop. The antenna system of your present arrangement is far superior. However, the 80-foot direct antenna, since the over-all length includes lead-in, should prove sufficient.

Avoidance of any possibility of contact with service lines is necessary and should be given due consideration.

Fading signals may be due to unsteady filament through various sources, such as loose vibrating coils, defective rheostat or poor connection to antenna and ground causing tube to oscillate intermittently. On the other hand that may be due to the natural phenomena known as "fading." Howling is generally incidental to imperfect tuning.

### Reinartz Resistance

(06192) MMG, St. Petersburg, Fla.  
The 1,000-ohm resistance used in the improved Reinartz circuit R.D.-104?

Circuit and description of a one-step power amplifier to be used after two stages of amplification?

I have been a reader of Radio Digest for the past year and a half and have found that it never has failed to be beneficial and extremely interesting. I read

with interest and no little amusement the criticism in the October 24 Questions and Answers page. He was all wrong and a little selfish. I am sure that if he reads your paper carefully he can find a lot of help even for a man as experienced as he claims to be. From my viewpoint you have neither neglected the beginner nor those more advanced. I for one have learned what little I know from your worthy paper and I assure you that you are to be congratulated all the way through for your conservative methods.

A.—The resistance indicated is non-inductive and made of graphite. If phones are of 3,000 ohms' resistance it is not generally necessary.

A power amplifier is connected as another stage of audio frequency amplification as illustrated in diagram of circuit appearing on page fifteen of the September 1st issue of Radio Digest. We are recommending the employment of a C battery as a measure of conservation of B battery where three stages of amplification are connected.

### Audio Amplification

(9230) WK, Hopkins, Mich.

I have an Edison storage B battery of 130 volts (100 cells) of the test tube type. It discharges too often to suit me, I was wondering if I could change it to 65 volts and use 2 cells in the place of one, and this way bring up the amperage so that it would last longer. I would like to know if this would work successfully? How can I arrange and hook-up. I am using a 5 tube neodyne. Do you think it would be enough voltage to bring good

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## PATENTS

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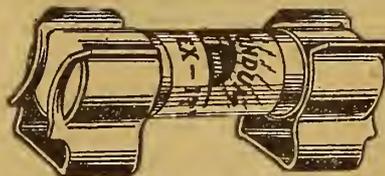
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results? What causes a steady whistle while using 3 stages of audio frequency?

A.—Your Edison B battery, can be changed to meet your requirements by dividing and connecting two halves in parallel which, with this change, will afford sufficient voltage, no doubt.

It is possible that you are employing transformers of too high a ratio, or that they are not effective types, which results in distortion on three stages. A method of overcoming this difficulty was described on page twelve of April 23, 1923, issue of Radio Digest. Briefly, it is accomplished by connecting a pencil line grid leak across the secondary of the last transformer, adjusting until disturbance ceases.

### Long Wave Transformers

(9139) ICM, Olivet, Mich.

On page 25 of the January 26, 1924, issue of Radio Digest details were given for the construction of transformers for a super-heterodyne receiver. May I ask a couple of questions concerning this?

Are the layers separated by insulation, such as empire cloth or waxed paper or are they wound directly on one another?

In winding, are the layers wound across and back or are they wound across, then back with one turn and across again?

A.—There is no insulation used between layers which are simply wound one upon another back and forth.

### Reinartz Circuit

(9235) JD, Blawnox, Pa.

In the Reinartz set should a 23-plate or an 11-plate variable condenser be used in the grid circuit?

A.—A .0005 mfd. (23-plate) variable condenser is indicated for the grid circuit of the Reinartz tuner.

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# Radiophone Broadcasting Stations

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**AA3**, Denver, Colo. 440 meters. Fitzsimmons Gen. Hospital. (Educational Dept. U. S. Army). Thurs, 7:30-8:30 pm, music, entertainment. Mountain.

**AQ6**, Canton, O. 425 meters. Hdqts. 135th Field Artillery O. N. G.

**AT9**, Fort Bragg, N. C. 345 meters. 500 watts. U. S. Government. Slogan: "The Voice of the Tar Heel States." Tues, Thurs, 8:30-9:35 pm, dance music, talks, band, fights. Sun, 8-9 pm, service. Eastern.

**AV7**, St. Paul, Minn. 400 meters. 6th Inf. Minn. Nat'l Guard, St. Paul Armory. Irregular schedule. Central.

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

**CAF**, Calgary, Alta. Can. 430 meters. 1000 watts. Calgary Herald. Daily ex Sun, 1 pm; Tues, Wed, Fri, Sat, 7:45-8:45; Mon, Thurs, 9-11, vocal, dance music, news, market, weather. Sun, 11 am, 7:30 pm, church services. Mountain.

**CFGA**, Toronto, Ont. Can. 400 meters. 1000 watts. Toronto Star. Daily ex Sun, 12 m, weather, news, stock; 5:30-6 pm, news; 8-9 pm, music. Sun, 7 pm, church services. Eastern.

**CFGF**, Montreal, P. Q. Can. 400 meters. 400 watts. Marconi Wireless Tel. Co. Daily 1-1:30 pm. Mon, 7:30-12 midnight; Wed, 6-8 pm; Fri, 7:30-12 midnight, music, entertainment, reports. Eastern.

**CFH**, Iroquois Falls, Ont. Can. 400 meters. 250 watts. Adair Paper Co. Ltd. Slogan: "The Call of the North." Experimental station for forest protection.

**CFJ**, Quebec, Que. Can. 410 meters. La Cie de L'Evenement.

**CFK**, Edmonton, Alta. Can. 410 meters. 115 watts. Radio Supply Co. Ltd. Daily ex Sun, 8:30-3 pm, music. Sun, 3:30-4:30 pm, Concert. Mountain.

**CFKL**, Victoria, B. C. Can. 400 meters. 500 watts. Centennial Methodist Church. Slogan: "Where Religion Cheers." Tues, 8:30-10:30 pm, concerts, lectures. Thurs, 8:30-10 pm, Chamber of Commerce. Sun, 11 am, 7:30 pm, church services. Pacific.

**CFM**, Calgary, Alta. Can. 440 meters. 1000 watts. W. W. Grant. Slogan: "Voice of the Prairies." Thurs, 8 pm, Sat, 10-12 pm, dance music. Sun, 11 am, church service. Test program, Sat after midnight. Mountain.

**CFN**, Bellevue, P. Q. 450 meters. Semmelhaack-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 sacred music. Eastern.

**CFQ**, Vancouver, B. C. Can. 450 meters. 10 watts. Radio Specialties, Ltd. Daily 4:30-5:30 pm. Music. Pacific.

**CFR**, Sudbury, Ont. Can. 410 meters. 100 watts. Laurentide Air Service, Ltd. Daily ex Sun, 1 pm, 6 pm, stocks, financial news. Wed, 8:30 pm, Eastern.

**CFW**, London, Ont. Can. 420 meters. 500 watts. London Radio Co. Irregular schedule.

**CFDC**, Nanaimo, B. C. Can. 430 meters. 10 watts. Sparks Co. Mon, Wed, Fri, 7:30-9 pm. Pacific.

**CFD**, Saskatoon, Sask. Can. 400 meters. 250 watts. The Electric Shop, Ltd. Slogan: "The Hub City of the West Where No 1 Northern Hard Wheat Grows." Daily ex Sun, 12:15-12:45 pm, markets, reports, music. Mon, Tues, Thurs, Fri, 7:30-9 pm, news, reports, markets, entertainment. Sun, 9-9:45 pm, church services. Mountain.

**CFE**, Kingston, Ont. Can. 450 meters. 500 watts. Queen's University. Discontinued temporarily.

**CFU**, Montreal, P. Q. Can. 400 meters. Univ. of Montreal.

**CFX**, New Westminster, B. C. 440 meters. 20 watts. Westminster Trust Co. and Hume & Rumble, Ltd. Slogan: "Voice of the Fraser River." Mon, Wed, Fri, 7:30-8:30 pm, Pacific.

**CFY**, Vancouver, B. C. 400 meters. Victor W. Odium.

**CHAC**, Halifax, N. S. Can. 400 meters. 20 watts. Radio Engineers. Slogan: "Come to Nova Scotia." CHBC, Calgary, Alta. Can. 410 meters. The Calgary Albertan. Daily ex Thurs, Sat, Sun, 8:45-9 pm, news, stock quotations, music. Thurs, 7:45 pm, Mountain.

**CHCB**, Toronto, Ont., Can. 440 meters. Marconi Wireless Tel. Co.

**CHCD**, Quebec, Que. Can. 410 meters. Canadian Wireless and Electric Co. Mon, 7:30-9 pm; Wed, 8-9; Sat, 6-10, music. Eastern.

**CHCE**, Victoria, B. C. Can. 310 and 400 meters. Western Canadian Radio Suppl. Ltd. Slogan: "The Voice of the Island." Daily ex Sun, 7-8 pm, music, stock reports, entertainment. Sun, 9-10 pm, music entertainment. Pacific.

**CHCL**, Vancouver, B. C. Can. 440 meters. 2000 watts. The Vancouver Merchants Exchange, Ltd.

**CHM**, Calgary, Alta. Can. 440 meters. 750 watts. W. W. Grant, (Riley & McCormick, Ltd.) 10 pm, music. Mountain.

**CHS**, Hamilton, Ont. 410 meters. Hamilton Spectator Bldg. Daily ex Sun, 6:45 pm, news, markets, baseball. Eastern.

**CHT**, Toronto, Can. 350 meters. 240 watts. Toronto Radio Research society. Mon, 9:30 pm, concert. Eastern.

**CHY**, Montreal, Que., Can. 341 meters. 500 watts. Northern Elec. Co. Wed, 8:30 pm, Sun, 7 pm. Eastern daylight saving.

**CIGA**, Edmonton, Alta. Can. 450 meters. 500 watts. Edmonton Journal, Ltd. Slogan: "The Sunniest Spot in Sunny Alberta." Club "4600 Hut." Daily ex Sun, 12:30 pm, weather, markets, 7:30-8 pm, Children's half hour. 8:30-9:30 pm, (ex. Tues), concert, reports. Mountain.

**CIGD**, Toronto, Ont., Canada. 410 meters. T. Eaton Co. Mon, Wed, Fri, 4-4:30 pm, music. Eastern.

**CIE**, Vancouver, B. C., Can. 420 meters. Sprott-Shaw Radio Co. Daily ex Sun, 12:30-1:30 pm, 3:30-5 8-10, music, news. Pacific.

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

**CIGM**, Mont Joli, P. Q., Can. 312 meters. 500 watts. Dr. J. L. P. Landry. "Three weeks before Quebec where civilization nearly ends." Daily 5-6 pm, news; 11:30-1 am, Radio vaudeville. Mon, Wed, Sat, 8-10 pm, music. Eastern.

**CIGN**, Toronto, Ont., Can. 410 meters. Simons Agnew & Co., Signals.

**CIGX**, Olds, Alta., Can. 400 meters. 200 watts. Perceval W. Shackleton. Closed temporarily.

**CIGL**, London, Ont. Can. 430 meters. 1000 watts. London Free Press. Daily ex Sun, 7:15-8:15 pm, news, market, weather, music, entertainment. Eastern.

**CISC**, Toronto, Ont., Can. 430 meters. The Evening Telegram.

**CKAC**, Montreal, Que., Can. 425 meters. 2000 watts. La Presse. Wed, Fri, Mon, 1:15 pm, orchestra. Daily ex Sat, Sun, 4 pm, music; 4:30 weather, markets, stocks. Tues, Thurs, Sat, 7 pm, children's hour; 7:30, concert; 10:30, specials. Sun, 4:30 pm, sacred concert. Eastern daylight saving.

**CKCD**, Vancouver, B. C., Can. 410 meters. 2000 watts. Vancouver Daily Province. Daily ex Sun, 8:30-9:30 pm, music, news, entertainment. Pacific.

**CKCE**, Toronto, Ont., Can. 450 meters. 750 watts. Can. Ind. Telephone Co. Occasional programs.

**CKCI**, Quebec City, Can. 285 meters. 50 watts. Daily "Le Soleil." Thurs, 8:30 pm, dance music. Sun, 8:30 pm, concert. Eastern.

**CKCK**, Regina, Sask., Can. 420 meters. 500 watts. Leader Pub. Co. "The Queen City of the West." Daily ex Sat, Sun, 9:45-10:30 am; 1:30-2:15 pm; 7:30-8:15, music, news, markets. Sat, 9:45-10:30 am; 1:30-2:15 pm. Mountain.

**CKD**, Ottawa, Ont., Can. 400 meters. Dr. G. M. Geldert (Ottawa Radio Assn). Tues, 8:30-10:45 pm. Sun, 7 pm. (services); 9, sacred concert. Eastern daylight saving.

**CKX**, Calgary, Alberta, Can. 440 meters. 500 watts. F. Burns & Co., Ltd. Tues, 9-10 pm, music, lectures. Mountain.

**CKOC**, Hamilton, Ont., Can. 410 meters. 20 watts. 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. 500 watts. Manitoba Tel. System. Daily ex Sun, 12:30-1:30 pm, music, lectures, etc.; markets, weather. Tues, Fri, 8:15-10 pm, concert. Thurs, 8:30 pm, markets; 9, Canadian Nat. Railways concert (CNRW). Sun, 7 pm, church services. Central.

**CNO**, Ottawa, Can. 455 meters. 500 watts. Cana-

dian National Railways. Wed, Sat, 8 pm. Eastern daylight saving.

**CW**, Paris, France. Eiffel Tower. 2,600 meters. Sun, Wed, 9:15-9:55 pm, concert. G. M. T.

**CYB**, Mexico City, Mex. 370 meters. 500 watts. El Buen Tono. Tues, Sat, 7:30-9 pm. Thurs, 8-10 pm, concert. Mexican.

**CYL**, Mexico City, Mex. 510 meters. 500 watts. La Casa del Radio. Daily ex Sun, 1:30-2 pm, weather, financial reports, music. Tues, Fri, 9-10:30 pm, Mexican.

**CYD**, Monterey, Mex. 234 meters. 200 watts. Tarnava & Cia. Daily ex Sun, 12-6 pm, news, markets, baseball. Wed, 8:30-10:30 pm, Mexican.

**CYX**, Mexico City, Mex. 330 meters. 300 watts. Excelsior Parker. Slogan: "Land of the Aztecs." Mon, 8-10:30 pm; Fri, 7-8:30 pm. Mountain.

**ESP**, Paris, France. 450 meters. 480 watts. Superior School P. T. T. Mon, Wed, Fri, Sat, Sun, 8:30 pm, talks, music. Tues, 8 pm, English course. Thurs, 8:15, topics of the day. G. M. T.

**HBI**, Geneva, Switzerland. 1100 meters. 600 watts. Marconi's Wireless Telegraph Co., Ltd. Daily ex Sun, 3-15 pm, music, news, Swiss.

**KBEL**, Prague, Czechoslovakia. 1150 meters. 1000 watts. Radio-Journal Broadcasting Co. Daily ex Sun, 10 am, 11:30, 1:30 pm, 5, 6, exchange rates, stocks, markets; 7:15-8 pm, concert; 8:15-9 concert. European mean time, one hour in advance G. M. T.

**KBBG**, Buffalo, N. Y. 146 meters. 100 watts. Thomas H. Ince Studios.

**KDKA**, E. Pittsburgh, Pa. 326 meters. 1,000 watts. Westinghouse Elec. & Mfg. Co. Daily ex Sun, 9:45-10 am. 12-1 pm, market reports, music; 5:30-10, news, features, markets, concert; 9:55-10, time. Sun, 10:45 am, church services; 2:15 pm, concert; 4:45 pm, 7:30, church service; 5:30, dinner concert. Eastern.

**KDPM**, Cleveland, O. 270 meters. 500 watts. Westinghouse Elec. & Mfg. Co.

**KDPT**, San Diego, Calif. 224 meters. 50 watts. Southern Elec. Co. Slogan: "At the End of the Trail." Daily ex Sun, 1:30-2:30 pm. Tues, Thurs, Fri, Sat, 6:00-8:45 pm, Wed, 8:00-10:00 pm, Pacific.

**KDYL**, Salt Lake City, Utah. 360 meters. 500 watts. Newhouse Hotel. Slogan: "Better Radio." Daily ex Sun, 6:30-8 pm, news, music, entertainment. Mountain.

**KDYM**, San Diego, Calif. 280 meters. 100 watts. Savoy Theater. Closed for the summer.

**KDYB**, Portland, Ore. 360 meters. 50 watts. Oregon Institute of Technology. Slogan: "The Radio School." Educational programs.

ael's Cathedral. Sun, 11:15-12:30 pm. Mountain.

**KFAM**, Tucson, Ariz. 268 meters. 50 watts. Univ. of Ariz. Irregular schedule.

**KFDJ**, Corvallis, Ore. 360 meters. 50 watts. Oregon Agri. College. Closed for the summer.

**KFDX**, Shreveport, La. 360 meters. 100 watts. First Baptist Church. Sun, 11 am, 7:30 pm. Central.

**KFDY**, Brookings, S. D. 360 meters. 50 watts. S. D. State College. Daily ex Sun, 1:30 pm, livestock markets. Central.

**KFDZ**, Minneapolis, Minn. 231 meters. 10 watts. Harry O. Iverson. Mon, 8:15-9:15; Sun, 5:30-6:30 pm, pipe organ. Central.

**KFEC**, Portland, Ore. 248 meters. 50 watts. 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. 254 meters. 50 watts. The W. L. Winner Radio Shop. Daily ex Sun, 9-10 am, 11-12, 2-3 pm; Wed, 8-9; Thurs, 10-12; Fri, 9-10; Sun, 2-3 pm. Mountain.

**KFEQ**, Dak. Nebr. 268 meters. 100 watts. J. L. Scroggin. Fri, 9-10 pm. Central.

**KFER**, Fort Dodge, Ia. 231 meters. 10 watts. Auto Electric Service Co.

**KFEV**, Casper, Wyo. 263 meters. 250 watts. Casper Radio Club. Slogan: "The Industrial Hub of West." Daily, 8:30 am, weather warnings, entertainment. Tuesday evening program. Sun, 3 pm, services; 8, special program. Mountain.

**KFEX**, Minneapolis, Minn. 261 meters. 100 watts. Augsburg Seminary. Closed for the summer.

**KFEY**, Kellogg, Ida. 360 meters. 10 watts. Bunker Hill & Sullivan Mining & Con. Co. Slogan: "Voice of the Cocco D'Alene." Mon, Wed, Sat, Sun, 7:30-8:30 pm. Pacific.

**KFEZ**, St. Louis, Mo. 248 meters. 250 watts. Associated Engineering Societies. Wed, 8:30-9:30 pm, Engineering program. Central.

**KFFB**, Boise, Ida. 273 meters. 10 watts. Jenkins Furn. Co. (Owyhee Hotel). Tues, Thurs, Sat, 8-10 pm, concert. Mountain.

**KFFE**, Pendleton, Ore. 360 meters. 10 watts. Eastern Ore. Radio Co. Daily 8:30-9:30 pm, music. Pacific.

**KFFP**, Moberly, Mo. 266 meters. 50 watts. First Baptist Church. Sun, 11 am; 8 pm. Central.

**KFFR**, Sparks, Nev. 226 meters. 10 watts. Jim Kirk. Thurs, 7-8 pm. "Sagebrush Canaries." Pacific.

**KFFV**, Lamon, Ia. 250 meters. 100 watts. Grace-Land College. Tues, 7 pm, musicale. Thursday, 7 pm, educational program. Sun, 6:30 pm, religious services. Central.

**KFFX**, Omaha, Nebr. 278 meters. 100 watts. McGraw Co. Daily, 2:30-3:50 pm. Central.

**KFG**, Alexandria, La. 275 meters. 50 watts. Pinch & Matherly, Inc. Mon, Thurs, 7-8:30 pm. Central.

**KFGC**, Baton Rouge, La. 254 meters. 100 watts. Louisiana State University. Closed for the summer.

**KFGD**, Chickasha, Okla. 248 meters. 200 watts. Okla. College for Women, Chickasha Radio & Elec. Co. Tues, Thurs, Sat, 8 pm, music, lectures. Wed, 10 am, chapel service; 11 pm, special jazz program. Central.

**KFGH**, Stanford Univ., Calif. 273 meters. 500 watts. Leland Stanford Junior University. No regular schedule.

**KFGL**, Arlington, Ore. 234 meters. 10 watts. Arlington Garage. Fri, 7:30-8:30 pm. Pacific.

**KFGM**, Boone, Ia. 326 meters. 10 watts. Cray Hardware Co. Wed, 8-9 pm; Sun, 3-4 pm. Central.

**KFGX**, Orange, Tex. 250 meters. 500 watts. First Presbyterian Church. Sun, 11 am, 7:30 pm, church services. Central.

**KFGZ**, Berrien Springs, Mich. 286 meters. 500 watts. Emanuel Missionary College. Slogan: "The Radio Light House." Mon, Fri, Sun, 7 pm, bedtime story. Mon, 7:45-9 pm, music. Fri, 9-10 pm, sacred music. Sun, 9:30 am; 7:45-9 pm, talks, music. Central.

**KFHA**, Gunnison, Colo. 252 meters. 50 watts. Western State College of Colorado. "Where the Sun Shines Every Day." Tues, Fri, 6:30 pm, bedtime story; 7:30 pm, musicale. 10:30, orchestra. Mountain.

**KFHJ**, St. Joseph, Mo. 226 meters. 100 watts. Utz Electric Co. Mon, Fri, 8-9:30 pm, concerts. Central.

**KFHH**, Neah Bay, Wash. 261 meters. 50 watts. Ambrose A. McCue. Tues, Thurs, 9-10 pm; Sat, 9-11 pm, dance. Pacific.

**KFHI**, Santa Barbara, Calif. 360 meters. 100 watts. Fallon & Co. Wed, Fri, 6-6:45 pm; Wed, Sat, 10-11 pm, dance music. Sun, 10 am, church services. Pacific.

**KFHR**, Seattle, Wash. 263 meters. 100 watts. Star Elec. & Radio Co. Slogan: "The Voice of the Charmed Land." Daily ex Sun, 4:30-5:30 pm. Mon, Wed, Fri, 6:30-7:30 pm. Tues, Thurs, Sat, 6:30-8:30 pm. Sun, 1-3 pm; 4:30-7:15, Pacific.

**KFI**, Los Angeles, Calif. 469 meters. 500 watts. Earle C. Anthony, Inc. Slogan: "The Radio Central Station." Daily ex Sun, 5-6 pm, 6:45-8 pm, 8-11 pm. Wed, Fri, Sat, 8-12 pm. Sun, 10-10:45 am, 4-5 pm, 8:45-8-11. Pacific.

**KFII**, Portland, Ore. 360 meters. 200 watts. Benson Tech. Student Body.

**KFIL**, Louisburg, Kans. 234 meters. 50 watts. Windisch Elec. Farm Equip. Co. Wed, Sat, 8-10:30 pm. Sun, 11-12 m, church services. Central.

**KFID**, Spokane, Wash. 252 meters. 50 watts. North Central High School.

**KFIE**, Yakima, Wash. 242 meters. 50 watts. First Methodist church.

**KFIU**, Juneau, Alaska. 226 meters. 10 watts. Alaska Elec. Light & Power Co. Mon, Wed, Fri, 7-8 pm. Alaskan.

**KFIX**, Independence, Mo. 240 meters. 250 watts. Reorganized Church of Jesus Christ of Latter Day Saints. Tues, Thurs, 9 pm. Sun, 11 am, 7:30 pm. Central.

**KFIZ**, Fond du Lac, Wis. 273 meters. 100 watts. Daily Commonwealth and Seyfert Radio Corp. Daily ex Sun, 5 pm, music, news, markets, weather. Central.

**KFJB**, Marshalltown, Iowa. 248 meters. 10 watts. Marshall Elec. Co. Slogan: "Marshalltown, the Heart of Iowa." Tues, Fri, 8:30 pm. Central.

**KFJC**, Seattle, Wash. 270 meters. 100 watts. Seattle Post Intelligencer. Slogan: "In the Charmed Land." Mon, Tues, Wed, Fri, 3:30-4:30 pm, music; 8:30-10, programs, dance music. Thurs, 10:30 pm, Tillicum meetings. Tues, Sat, 3:30-4:30 pm. Pacific.

**KFJF**, Oklahoma City, Okla. 252 meters. 20 watts. National Radio Mfg. Co. Slogan: "Radio Headquarters." Daily ex Sun, 7 pm. Mon, Wed, Thurs, Sat, 8:30 pm. Central.

**KFJI**, Astoria, Ore. 252 meters. 10 watts. E. E. Marsh and Liberty Theater.

**KFK**, Bristol, Okla. 233 meters. 100 watts. 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. 10 watts. Harsoeg Mfg. Co. Club. "Boiled Bugs." Mon, Wed, Fri, 8-9:30 pm. Central.

**KFJM**, Grand Forks, N. D. 280 meters. 100 watts. University of North Dakota.

**KFJQ**, Oklahoma City, Okla. 230 meters. 5 watts. Valley Radio Div. of Elec. Constr. Co.

**KFJJ**, Cedar Falls, Iowa. 280 meters. 50 watts. Iowa State Teachers' College. Educational programs.

**KFJY**, Fort Dodge, Iowa. 246 meters. 50 watts. Tunwall Radio Co. Daily, 12 m, 5:45 pm, markets, news, weather. Sun, 11 am, 7:30 pm, church services. Central.

**KFJZ**, Fort Worth, Texas. 240 meters. 20 watts. Texas National Guard, 112th Cavalry. Wed, 8:30-9:30 pm. Sat, 8:30-10 pm, program. Central.

**KFKA**, Greeley, Colo. 273 meters. 50 watts. Colorado State Teachers College. Mon, Tues, Wed, Thurs, 7 pm, lectures.

**KFKB**, Milford, Kans. 286 meters. 500 watts. Brinkley-Jones Hospital Assn. Slogan: "The Home of Gland Transplantation." Daily ex Sun, 8 pm, lecture; 8:30, 9, 12:45, 2 am, music. Sun, 10-12 m., 8-10:30 pm, church services. Central.

**KFKC**, Conway, Ark. 250 meters. 100 watts. Conway Radio Lab. Tues, Fri, 8 pm, music. Central.

**KFKV**, Butte, Mont. 283 meters. 50 watts. F. F. Gray. Sun, Wed, Fri, 8:30-9:30 pm. Mountain.

**KFKX**, Hastings, Neb. 341 meters. 1000 watts. Westinghouse Elec. & Mfg. Co. Mon, Thurs, 9:30-11 pm, broadcasts own program. Rebroadcasts KDKA's programs. Tues, 9:30-12 pm; Thurs, 11 pm. Central.

**KFKZ**, Colorado Springs, Colo. 224 meters. 26 watts. Nassour Bros. Radio Co. Daily ex Sun, 12-1 pm, 5-6, matinee musicale. Sun, 11-12 m, church services. Mountain.

**KFLA**, Butte, Mont. 283 meters. 5 watts. Abner R. Willson.

**KFLD**, Franklinton, La. 234 meters. 20 watts. Paul E. Greenlaw.

**KFLE**, Denver, Colo. 268 meters. 100 watts. National Educational Service. Daily ex Wed, 7-7:30 pm. Broadcasts for schools on request. Mountain.

**KFLQ**, Little Rock, Ark. 261 meters. 10 watts. Bizell Radio Shop. Irregular schedule.

**KFLR**, Albuquerque, N. M. 254 meters. 100 watts. U. of N. M. Slogan: "The Sunshine Center of America." Fri, 8 pm, educational program. Mountain.

**KFLU**, San Benito, Texas. 236 meters. 100 watts. Rio Grande Radio Supply House. Slogan: "Heart of the Magic Valley." Mon, Thurs, Sat, 8:30-10 pm, concert. Sat, 8:30 pm, Sunday school lesson. Central.

**KFLV**, Rockford, Ill. 229 meters. 100 watts. Rev. A. T. Frykman. Sun, 12:30 pm, Service for Swedes (Swedish); 9:45, Service (English). Central.

**KFLW**, Missoula, Mont. 234 meters. 5 watts. Missoula Elec. Supply Co.

**KFLX**, Galveston, Texas. 240 meters. 10 watts. George R. Clough.

**KFLZ**, Atlantic, Iowa 273 meters. 100 watts. Atlantic Automobile Co. Slogan: "The Garden Spot of Iowa." Wed, 6-7:15 pm, dinner program; 9-11, music. Sat, 11-12:30, midnight, dance music. Sun, 8 pm, church service. Central.

**KFMB**, Little Rock, Ark. 254 meters. Christian churches of Little Rock.

**KFMD**, Paso Robles, Ark. 263 meters. 500 watts. U. of Arkansas. Tues, 9 pm. Central.

**KFMR**, Sioux City, Ia. 261 meters. 10 watts. Morning-side College. Tues, 7 pm. Tues, Thurs, Fri, Sat, 9:15 am. Central.

**KFMT**, Minneapolis, Minn. 231 meters. 5 watts. Dr. George W. Young. Tues, Thurs, 8:15 pm. Central.

**KFMW**, Houghton, Mich. 266 meters. 50 watts. M. G. Sateren. Off the air for the summer.

**KFMX**, Northfield, Minn. 283 meters. 500 watts. Carleton College. Wed, 7:30 pm. Central.

**KFNF**, Shenandoah, Ia. 266 meters. 500 watts. Henry Field Seed Co. Slogan: "Friendly Station in a Friendly Town." Daily ex Sun, 12:30-12:55 pm. Daily ex Sun, Mon, 7:30-9 pm, concert. Sun, 3 pm, services; 6:30-7:30, sacred song service. Central.

**KFNG**, Coldwater, Miss. 234 meters. 10 watts. Wooten's Radio Shop. Wed, 8-9 pm, Sat, 9:30-10:30 pm. Sun, 4-5 pm. Central.

**KFNJ**, Warrensburg, Mo. 234 meters. 50 watts. Warrensburg Elec. Shop. Tues, Fri, 8-10 pm. Central.

**KFNL**, Paso Robles, Calif. 240 meters. 10 watts. Radio Broadcast Assn. Slogan: "The Home of the Nut." Mon, 8-10 pm, music. Pacific.

**KFNV**, Santa Rosa, Calif. 234 meters. 5 watts. L. A. Drake.

**KFNY**, Helena, Mont. 261 meters. 5 watts. Montana Monograph Co. Slogan: "Helena, Heart of the Rockies." Mountain. 7:15-7:45 pm, concert and bedtime story.

**KFNZ**, Burlingame, Calif. 231 meters. 10 watts. Royal Radio Co. Daily ex Sun, 4-5:30 pm, concert; 7-7:30, news, weather. Wed, 8-10 pm, classical music. Sat, 8-12 pm, dance music. Pacific.

**KFOA**, Seattle, Wash. 453 meters. 500 watts. Rhodes Dept. Store. Tues, Wed, Fri, 12:30 pm, Mon, Wed, Fri, 8:30 pm, concert. Pacific.

**KFOC**, Whittier, Calif. 236 meters. 100 watts. First Christian Church.

**KFOD**, Wallace, Idaho. 224 meters. 10 watts. The Radio Shop. Slogan: "The Valley of Mines." Irregular schedule.

**KFOE**, Marshfield, Ore. 240 meters. 10 watts. Rohrer Elec. Co.

**KFOJ**, Moberly, Mo. 246 meters. 5 watts. Moberly High School Radio Club.

**KFOL**, Marengo, Iowa. 234 meters. 10 watts. Leslie H. Schaafbusch.

**KFON**, Long Beach, Calif. 234 meters. 100 watts. Echophone Radio Shop. Slogan: "Where Your Ship Comes In." Cheese and Crackers club. Daily ex Sun, 11:30 am and 12:30 pm, 8-9, Pacific.

**KFOO**, Salt Lake City, Utah. 261 meters. 10 watts. Latter Day Saints University.

**KFOQ**, Galveston, Texas. 240 meters. 50 watts. Ora William Chancellor. Special program during the summer.

**KFOR**, David City, Neb. 226 meters. 20 watts. David City Tire & Elec. Co. Slogan: "The Voice of David City." Sat, 8 pm, band.

**KFOY**, Wichita, Kansas. 231 meters. 50 watts. Collee Hill Methodist Church-College Hill Radio Club. Sun, 11-12:30 pm; 7:30-9, church services. Central.

**KFDU**, Richmond, Calif. 254 meters. 100 watts. Hommel Mfg. Co.

**KFDX**, Omaha, Neb. 243 meters. 100 watts. Board of Education, Technical High. Fri, 7:30-9 pm, music. Central.

**KFOY**, St. Paul, Minn. 226 meters. 50 watts. Beacon Radio Service. Slogan: "The Beacon of Progress." No definite schedule during the summer.

**KFDZ**, Fort Smith, Ark. 233 meters. 20 watts. Leon Hudson Real Estate Co. Mon, Fri, Sun, evening program. Central.

**KFDZ**, Fort Smith, Ark. 233 meters. 20 watts. Leon Hudson Real Estate Co. Irregular schedule.

**KFPB**, Seattle, Wash. 224 meters. 15 watts. Edwin J. Brown.

**KFPG**, Los Angeles, Calif. 238 meters. 100 watts. Garretton and Dennis.

**KFPH**, Salt Lake City, Utah. 242 meters. 50 watts. Harold Charles Mailander.

**KFPL**, Dublin, Tex. 242 meters. 20 watts. C. C. Baxter. Mon, Thurs, 8:30 pm. Sun, 7-8 am, 3:30 pm. Central.

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

### CHALLENGE!

ONE DOLLAR will be paid to the Radiophan 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, but such corrections must be certified by the stations themselves, and NOT by comparison to other so-called accurate Radiocast directories and lists. That's just how sure Radio Digest is that this Radiophone station directory is correct! To make the challenge fair for everyone, Radiocast stations and their employes are barred from this offer. Why? Because the Radiocasters 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 O K'd 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 five parts, serially continuously; the first four parts are station data listings, arranged alphabetically; the fifth 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, watts antenna input, owner's name, slogan used if any, name of listener in "club," schedule of operating hours, and kind of time used, as "Central," "Mountain," etc. Five successive issues of Radio Digest will give one the most complete and accurate list of Radiocast 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.

**KDZB**, Bakersfield, Calif. 360 meters. 100 watts. Frank Siefert. Daily ex Sun, Mon, 8-9 pm, reports, music. Sun, sacred program, irregular. Pacific.

**KDZE**, Seattle, Wash. 270 meters. 100 watts. The Rhoads Dept. Store. Daily, 12:30-1:30 pm. Pacific.

**KDZR**, Bellingham, Wash. 261 meters. 50 watts. The Bellingham Pub. Co. Slogan: "Tulip Town." Daily ex Thurs, 7-8 pm. Pacific.

**KFAD**, Phoenix, Ariz. 360 meters. 100 watts. McArthur Brothers Mercantile Co. Daily ex Sun, 7:30-8:30 pm, news, weather, stock reports, music. Mountain.

**KFAE**, Pullman, Wash. 330 meters. 500 watts. State College of Washington. Slogan: "Your Service Station."

**KFAF**, Denver, Colo. 278 meters. 500 watts. Western Radio Corp. Slogan: "Voice from the Rockies—Out Where the West Is." Mon, Tues, Thurs, Fri, Sat, 8-9 pm, music, reports, news. Mountain.

**KFAI**, Boulder, Colo. 261 meters. 100 watts. Univ. of Colo. Tues, Thurs, Sat, 9 pm, time, music, addresses by faculty. Sat, 2:30-5 pm, sports. Mountain.

**KFAR**, Hollywood, Calif. 280 meters. 100 watts. Studio Lighting Service Co.

**KFAU**, Boise, Ida. 270 meters. 150 watts. Boise H. S. Slogan: "Follow the Oregon Trail to Boise." Daily ex Sat, Sun, 3:30-4:15 pm, markets, weather, news. Mon, Wed, Fri, 8-9 pm, concert. Mountain.

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

**KFAY**, Medford, Ore. 283 meters. 50 watts. W. J. Hagan. Temporarily discontinued.

**KFBB**, Havre, Mont. 360 meters. 50 watts. F. A. Buttery Co. Daily ex Sun, 1 pm, markets, weather, reports. Mountain.

**KFBC**, San Diego, Calif. 278 meters. 15 watts. W. K. Azbill. Thurs, Sun, 8-9 pm, Bible lesson, sermon. Pacific.

**KFBE**, San Luis Obispo, Calif. 242 meters. 50 watts. B. H. Horn. Sun, Wed, 8-9 pm, music. Pacific.

**KFBG**, Tacoma, Wash. 360 meters. 50 watts. First Presbyterian Church. Sun, 11 am-1 pm, 7:30-9, Pacific.

**KFBK**, Sacramento, Calif. 283 meters. 100 watts. Kimball-Uspon Co. Slogan: "Gateway to California." Daily ex Sun, 5:45-6 pm, concert, news, codes. Pacific.

**KFBL**, Everett, Wash. 224 meters. 20 watts. Lesse Bros. Daily, 7:15-8:15 pm. Sun, 2-3 pm. Pacific.

**KFBS**, Trinidad, Colo. 230 meters. 10 watts. Chronicle News & Gas & Elec Supply Co. Mon, 8-10 pm. Mountain.

**KFBU**, Laramie, Wyo. 283 meters. 50 watts. The Cathedral. Sun, 7:30 pm, church service. Mountain.

**KFCB**, Phoenix, Ariz. 278 meters. 10 watts. Nielson Radio Supply Co. Slogan: "When It's Wintertime In Michigan, It's Summertime Down Here." Daily, 7-7:30 pm, bedtime stories. Mountain.

**KFCF**, Walla Walla, Wash. 360 meters. 100 watts. Frank A. Moore. Mon, Fri, 8-9:30 pm. Pacific.

**KFCL**, Los Angeles, Calif. 236 meters. 500 watts. Leslie E. Rice.

**KFCP**, Ogden, Utah. 360 meters. 25 watts. Ralph W. Flygare.

**KFG**, Houston, Tex. 360 meters. 10 watts. Fred Mahday, Jr. Daily ex Sun, 7:30-8 pm, entertainment. Sun, 2-3 pm, entertainment. Central.

**KFCZ**, Omaha, Neb. 258 meters. 50 watts. Central J. S. Mon, Tues, Thurs, 7:30-9 pm, Sat, midnight program. Central.

**KFDD**, Boise, Idaho. 252 meters. 10 watts. St. Mich-

services. Central.

**KFFX**, Omaha, Nebr. 278 meters. 100 watts. McGraw Co. Daily, 2:30-3:50 pm. Central.

**KFG**, Alexandria, La. 275 meters. 50 watts. Pinch & Matherly, Inc. Mon, Thurs, 7-8:30 pm. Central.

**KFGC**, Baton Rouge, La. 2

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