

How to Stop the 'Birdies' from Neighbors' Sets; Week's Advance Programs; Details of Democratic Convention Broadcasting; Installing Hupmobile Set

Radio Digest

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

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

Vol. IX Copyright 1924 By Radio Digest Publishing Co. SATURDAY, JUNE 21, 1924 No. 11

TELEPHONE OVER OCEAN

RADIO BABY-QUEEN TO STAR ON SCREEN

7-YEAR-OLD "TITANIA" GETS ANOTHER JOB

Great Popularity Among Child Radio Audiences Wins Little Girl Place in Films

By Strachan McMillan

LOS ANGELES.—For the first time in history, so far as is known, the motion picture world has found a new star through the medium of Radio broadcasting. To KHJ, Los Angeles Times station, goes the credit of having brought this wonder child of the silver-sheet into prominence.

Some nine months ago, KHJ on a Tuesday evening children's program, introduced to Radioland, what was entitled "The Sandman's Hour." This offering consisted of a visit to the broadcast studio from two members of the realm of Fairyland; one being "Queen Titania," ruler of the Fairies and the other being the "Sandman." The principal part of the forty-five-minute children's program centered around "Queen Titania." The continuity was entirely original.

Queen Titania, 7-year-old mystery child, who appears on the Tuesday evening children's program at KHJ, Los Angeles, is now being featured in a series of movie comedies.



BRITISH OKEH PLAN LINKING TWO POWERS

Will Mean American Phone Users Can Converse Direct with English Cousins

Plan Station at Rugby

NEW YORK.—Establishment of a powerful, 200-kilowatt Radiophone transmitting plant, capable of reaching across the Atlantic ocean at any time, has been recommended by the British post office, reports here say. The erection of such a station will mean the direct linking of land wire telephone users of this country with their English cousins on the British Isles.

Rugby, England has been chosen by the British post office as the location of the (Continued on page 6)



Francine Larrimore (left), comedienne and star of Nancy Ann, the Harvard prize comedy recently talked on "Women in the Theater" from Station WJAR, Lit Bros., Philadelphia. Lois Rogers (right) is a frequent entertainer at WLAG, The Twin City and St. Paul station. Miss Rogers, who is a pianist, has appeared as soloist with the Minneapolis Symphony orchestra.



Without missing a week since that time, on each Tuesday evening at 6:45 Pacific time, the fairylike voice of "Queen Titania" has floated out on the wings of the ether from Station KHJ, until now her followers in Radioland number thousands. Each week a new, original manuscript is written for this program.

One of the peculiarities of the program is the fact that the real names of the (Continued on page 6)

Sunday Symphony from WLW

CINCINNATI, O.—Arrangements have been completed to give the Western and Southern association's musical concerts every Sunday evening from Station WLW, Crosley Radio corporation here. This symphony orchestra is composed of musicians from the famous Cincinnati Symphony and is under the direction of William Koop.

No. 5 OFFICIAL BALLOT
Announcers' Contest
RADIO DIGEST FIRST ANNUAL GOLD CUP AWARD

Gold Cup Award Editor, Radio Digest,
510 North Dearborn St., Chicago, Ill.

Please credit this ballot as one vote for:

.....of Station.....
(Announcer's name) (Call letters)
Signed
Address
City.....State.....

If you desire, tell below in five or less words what you most like about the
announcer for whom you have cast this ballot:

MORE NOMINATIONS
IN GOLD CUP AWARD

FANS ASK ANNOUNCERS TO
GIVE IDENTITY CLEW

Fourteen New Nominees During Week
—Voters Advised to Hold Ballots
for Bonus Count

Despite the fact that shrinking, blushing
announcers are doing their best to
prevent their identities from becoming
known by Radiophans, fourteen more
"men behind the mikes" were nominated
last week for the Radio Digest First
Annual Gold Cup Award.

The extent to which modesty among
announcers goes is illustrated well by the
effort of one southern gentleman of Irish
extraction to withdraw his name from the
race. He said he was too modest to be
voted on, even if his Irish blood did like
a good fight.

But we can't let him withdraw. Too
many nominations have come in already
for him.

Fans Strong for Their Favorite
Listeners in are taking to the nominat-
ing and voting like a submarine does to
seaweed. Letters show how loyal they
are to their own, hand-picked favorites.
One of these, with personalities elimi-
nated, follows:

"Because he is a Radiophan himself and
knows just what the Radiophans like and
shows it by the good programs which he
has arranged, I want to nominate....."

"Permit me to state that..... is
a real man, one of those fellows that can
shake your hand, and call you by your
first name. His voice is loud and clear,
always of good cheer and with a kind
word here and there. Makes the sun-
shine for the children, the rich, poor, sick,
and old.

"We are proud of him."

Want Announcers to Give Names
May I ask," writes another, "how we
Radiophans are going to tell who our
favorite announcers are? So many never
give their names or the slightest clew to
their identity."

This letter is typical of many hundred
received complaining about the same
thing.

Announcers, establish your personality!
Give your name, initials, wife's name,
alias, nickname or nom de plume. But
use a name, always, when you begin your
turn and when you finish your watch at
the microphone. It'll mean a lot in the
voting.

Modesty which cheats the invisible
out of information which it desires is
false. Radiophans want same clew to
who they may consider the world's most
popular announcer.

Fourteen New Nominations Received
The fourteen additional nominations re-
ceived last week were:

- Adair, Sam, WQQ, Kansas City.
Arnoux, G. C., WBAP, Fort Worth.
Bach, A. E. W., WBZ, Springfield.
Coggesill, A. O., WGY, Schenectady.
Hammond, Carl E., KFOA, Seattle.
Harris, Credo, WHAS, Louisville.
Hayner, Rutherford, WHAZ, Troy.
Northrup, Robert, WLS, Chicago.
Pierson, Wm. T., WCAP, Washington.
Reese, Paul, KFI, Los Angeles.
Rice, —, CJCA, Edmonton, Canada.
Schwartz, Phil, WQJ, Chicago.
Willets, G. V., WOC, Davenport.
Wilson, Walter, KYW, Chicago.

The complete list of nominations, in-
cluding those given last issue, makes a
total of seventy-six names.

Nominate Now; Vote Later
The lists of nominees, given this issue
and last, show what announcers have been
nominated and have nothing to do with
their standing so far as the actual bal-
loting is concerned. If your favorite an-

nouncer's name has appeared, do not
bother to renominate him. One nomina-
tion is enough.

Just save your votes for him! Remem-
ber that consecutive votes, saved in
groups, and turned in together, count for
more.

If your favorite announcer's name is not
given this week, just turn to page five,
fill the nomination certificate in and send
it to Radio Digest, care of the Gold Cup
Award Editor.

Remember to save your ballots appear-
ing on page two each week. It is by
means of the ballots that the award will
be made. The man or woman polling the
highest number of votes wins.

Rules and Regulations of Award
All broadcast station announcers are
eligible to enter. Nominations can be
made either by the announcer or any

Radiophan. Nominations should be made
by using the "Nomination Certificate" ap-
pearing on page five.

Beginning with the May 24 issue a
ballot is printed on page 2 of each issue
of this publication. These ballots are
numbered consecutively from one to six-
teen. The voting officially opened with
the publication of ballot No. 1 in the May
24 issue. The contest closes with ballot
No. 16 published in September 6 issue of
Radio Digest, and the official closing date
of this contest is midnight, September 8,
1924.

For sending in four consecutive ballots,
there will be a ten vote bonus; eight con-
secutive ballots, twenty-five vote bonus;
twelve consecutive ballots, fifty vote
bonus; and sixteen consecutive ballots,
seventy-five vote bonus.

Voting will consist of filling in the bal-
lots with the name, initials or nickname
of the announcer and the station and
mailing to the Gold Cup Award Editor.

Highest Vote Wins Gold Cup
The broadcasting station announcer
polling the largest number of votes in the
contest will be awarded the Radio Digest
gold cup. In the event of a tie for the
gold cup award each tying contestant will
receive the same identical award.

Anyone may vote for their favorite an-
nouncer with ballots clipped from Radio
Digest.

All votes to be credited must be mailed
on or before midnight, September 8, 1924.

The Radio Digest First Annual Gold
Cup Award will be made by a committee
appointed by the publication.

Any question that may arise during
the contest will be decided by the Gold
Cup Award Editor. His decision will be
final.

WGR Now Gives Series of
Physical Culture Lessons

BUFFALO, N. Y. — WGR has gone on
the air with a series of lessons in physical
culture. The lessons are broadcast Mon-
day, Wednesday and Friday mornings
between 11:15 and 11:45 o'clock, Eastern
daylight time. Henry T. Martin, assist-
ant physical director of the Buffalo Ath-
letic club, has charge of the series of
lessons.

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Looking Ahead

"Underground Antennas for Broadcast Reception" is the title of a series of articles
on a system of receiving that ELIMINATES STATIC. The articles begin next
issue and are prepared by Edward Thomas Jones, A. I. R. E., who has taken the
material direct from the work of the famous inventor of the scheme, Dr. J. H.
Rogers of Hyattsville, Md.

"Working Through Interference," is the attractive sounding title of Paul Edelman's
next contribution in the "Thirty-Minute" series for beginners. The secret
of tuning through local for distant stations will be explained.

Operating and Trouble Shooting the Trans-Continental Radiophone will occupy
the attention of this popular department next week. The directions are
valuable to the owner of any set.

A Portable Transmitter and Receiver, suitable for talking to your friends several
miles away, will be told about by Clarence H. West. The combination set is
just the thing for the summer camp.

Durant Car Owners will soon be informed how to equip their automobiles with
Radio. Included in the article by H. J. Marx is the description of a device
for the shock proof suspension of sets in motor cars.

Take Radio Digest with You
on Your Vacation

WHEN YOU WANT

Radio Digest

YOU WANT IT!

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BY SUBSCRIBING NOW

SEND IN THE BLANK TODAY

Publisher Radio Digest,
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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.....

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PORTABLE
4-TUBE RADIO RECEIVER

\$92.50 COMPLETE



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fine case ready to walk away with. Take it with
you on your Vacation, Auto Trip or to your Summer
Camp or Home. When you come back with it, take
it out of the case and use it as a home Radio
Receiving Set. It is complete in all details in-
cluding aerial, batteries and collapsible loud-
speaker. It is only 16 1/2 x 9 1/2 x 3 1/2 inches in size
and weighs 25 pounds. It is ready to operate when
you get it and costs.....\$92.50
NIGHTINGALE—4-Tube Radio Receiver with-
out accessories.....32.50
MOCKING-BIRD—6-Tube Indoor-Loop Radio
Receiver without accessories.....90.00

Write for Literature

Dealers—A wonderfully attractive proposition
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Penn. Nightingale Co.....Bellevue, Pa.
Badger Radio Co.....Milwaukee, Wis.
Phil. Gross Hdw. Co.....Milwaukee, Wis.
Goulding Mfg. Co.....Milwaukee, Wis.

THORDARSON



POWER
AMPLIFYING
TRANSFORMERS
Price per pair, \$13.00

The new Thordarson Power Ampli-
fying Transformers (push pull) are
designed for use as third stage audio
frequency amplifiers, to provide high
power amplification for operating loud
speaking devices.

With power amplification, not only
is it possible to increase volume, but,
since two tubes replace the usual one,
the distortion and howling which usu-
ally accompany the overloading of a
single tube on the third stage is done
away with entirely.

The Thordarson Power Amplifying
Transformers are well constructed
electrically and are capable of indefi-
nitely carrying the additional load
without breaking down.

In tonal purity these transformers
equal the Thordarson Super Audio
Frequency transformer whose rich
quality and even amplification has
made it the popular transformer of
the day.

THORDARSON
ELECT. MFG. CO.
500 W. Huron St. CHICAGO

SPEECH QUALITY IS IN CHOICE OF WORDS

'RADIO PHONETICS' LATEST ADDITION TO SCIENCE

Wheeler McMillen Tells WLS Audience How Microphone Success Can Be Attained Easily

CHICAGO.—In the wording of a sentence or phrase, in the choosing of a word, hinges the success or failure of the Radio speaker," said Wheeler McMillen, editor and agriculturist of national reputation, in a broadcast delivered recently from WLS, Sears, Roebuck station here.

While resonance is a big secret of successful Radio speaking, Mr. McMillen believes it but half the secret. Poor choice of words is the biggest trouble of most poor speakers, he says.

"Radio phonetics," said Mr. Wheeler, "is a new subject. As yet no one knows very much about it, but the man whose voice is lacking in Radio quality can substitute a carefully constructed speech, and the result will be a decided improvement. Short sentences of simple words are the most effective.

"If long sentences are used make them compound. Compound sentences are more simple than complex.

Emphasizing Ends of Sentences

"A monosyllable with a long vowel is harder to pronounce sharply than a syllable with a short vowel. Listeners in cannot see the periods by Radio; the speaker must make them evident. This can be done if words are chosen for the endings and beginnings of sentences that are sharply defined. The sentence ending especially must never be ragged. Words are clearest and most easily pronounced that end in sharp consonants, such as 'p' in handicap, 'k' in overlook, and 't' in pursuit.

"Words must be carefully chosen. Of a group of synonyms, there is always one that is most easily and clearly pronounced. Toil is a better word than work, for Radio use. The 't' is sharp as well as the diphthong.

"In the phrase, 'through legislative or economic channels,' 'routes' would have been a better word than channels. It is shorter. The phrase 'hangs back' is stronger than the word 'delays.' 'Put' is a better word than 'place'; 'start' is clearer than 'begin'."

Democrats Get Ready to Broadcast Confab

Install Special Equipment in Madison Square Garden

NEW YORK.—Radio equipment of the latest design will be found in Madison Square Garden next week with the opening of the democratic national convention here. Commercial Radio communication companies will maintain substations, a special speech pick-up and amplifying equipment will be used for sending the convention happenings to over a score of land wire-linked broadcast stations, and loud speakers installed outside the auditorium will repeat what is occurring inside.

Besides broadcasting convention highlights, speeches by party leaders will be made in the special studio which has been built for the purpose.

Spanish Fort Park Comes to Front as Broadcaster

NEW ORLEANS, LA. — Spanish Fort Park, regarded as one of the largest amusement parks in the south, is installing a broadcasting station with a planned range of 2,000 miles. Concerts of Tosso's Concert Band and the dance programs of Beyersdorfer's Novelty orchestra will be broadcast nightly. The park and the Crescent Amusement company are jointly sharing the expense.

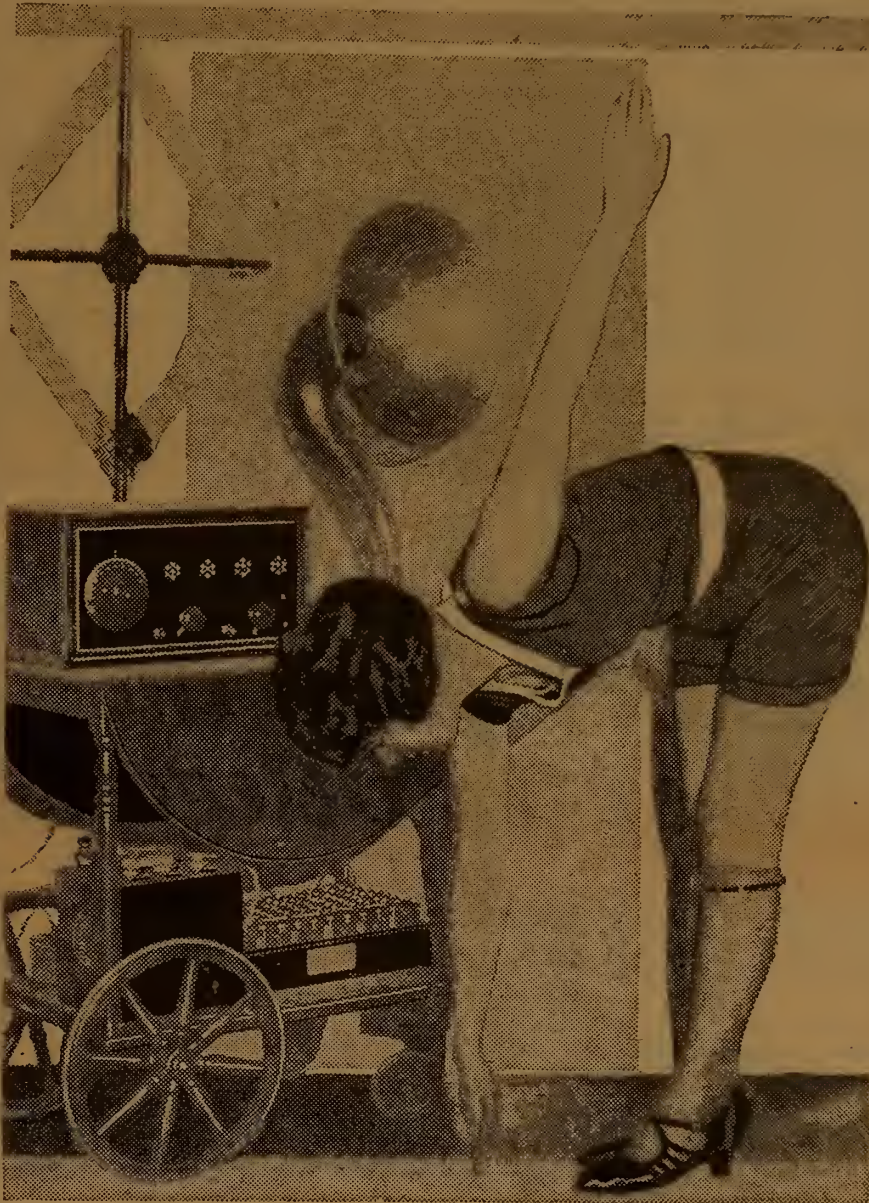
WENDELL HALL CAN TELL HIM ABOUT IT

WASHINGTON.—Strange letters from Radiophans continue to occupy the attention of the department of commerce. A recent one suggests that the continued rainy spells have been caused by broadcasts, saying that the Radio disturbances in the ether have caused commotion and this in turn has caused rain. The commerce department has "passed the buck," referring the letter to the weather bureau for reply.

RADIO LEADS MOVIE FILM LEADER SAYS

NEW YORK.—"Radio will be even a greater force in the molding of public opinion and influencing the lives of the human race than the moving pictures were. Radio not only entertains and appeals to all classes of people, but the ease with which it is received makes its effects more far reaching," said Lewis J. Selznick, internationally famous moving picture magnate, who has recently entered the Radio industry.

KEEPING TRIM BY LISTENING IN



Now comes the Radio gymnast, Miss Katherine Bonnet of San Francisco, who tunes in physical culture lessons broadcast by many stations nowadays. Miss Bonnet has mounted her set on a tea wagon so as to make it mobile. (Int. Photo.)

PENNSY PUTS O. K. ON RADIO'S RAILWAY AID

Tests of System with A.R.R.L. Prove Plan's Success

NEW YORK.—Extensive tests to determine the availability of the Radiotelegraph for transmitting railroad messages other than train orders in the event of emergencies arising in the use of the wire systems have been conducted successfully by the American Radio Relay

league and the Pennsylvania railroad management.

The tests, which covered the principal operating points on the Pennsylvania between the Atlantic seaboard on the east and the Mississippi river on the west, demonstrate that the service of the Radiotelegraph stations embraced in the league offers a practical means of emergency communication.

WLW Heard in England

CINCINNATI, O.—WLW station of the Crosley Radio corporation here, has been heard in England.

NO. 1,113,149 STILL INTACT, FIRM AVERS

WESTINGHOUSE TELLS ITS PATENT LICENSEES

Claims Recent DeForest Decision Has No Affect on Status of Armstrong Set Makers

NEW YORK.—The latest echo in the DeForest-Armstrong patent litigation has come to light in the Westinghouse company's issuance of a notice to holders of Armstrong licenses. The notice would convey the impression that the status of the licensees remains unchanged and that the famous patent number 1,113,149 is still untouched and valid.

The statement, in part, follows: "A great deal of publicity has been given to a recent decision of the Court of Appeals of the District of Columbia in an interference involving applications of Armstrong, DeForest, Langmuir and Meissner. The Armstrong application involved is serial number 807,338 which is one of the inventions recited in the Armstrong regenerative circuit license. "Armstrong application number 807,333 relates to the oscillating audion.

Will Go After New Patent

"The Westinghouse company as owner of the application has brought suit in the United States district court for the southern district of New York to compel the commissioner of patents to grant a patent to Armstrong on the counts involved in the recent District of Columbia decision, thus availing itself of the means provided by law for a review of the situation. It is believed that the facts of the case fully justify the belief that an additional patent will eventually be granted to Armstrong.

"Armstrong patent number 1,113,119 was not involved in the interference. This patent (1,113,149) has been sustained in the United States circuit court of appeals for the second circuit in the case of Armstrong and Westinghouse against DeForest Radio Telephone and Telegraph company."

THIRD CONFAB IN JULY OR AUGUST

Secretary Hoover Sees No Way of Scheduling Radio Conference Earlier

WASHINGTON.—There is a possibility that the third Radio conference, which Secretary of Commerce Hoover has announced he will call, will not take place until the autumn.

The secretary will not go ahead with active preparations for the conference until he is certain just what Congress is going to do about Radio legislation.

In addition to this the Secretary wants to appoint some committees so that when the conference is actually called some program will be ready to lay before it. He has not yet decided whether these committees should be appointed before the conference, during it, or after it. These are details which have not yet been worked out. Indications at this time are then, that the third Radio conference will be held possibly in July, August or in the early autumn.

Aldermen Prepare to Ease Life of Chicago Radiophan

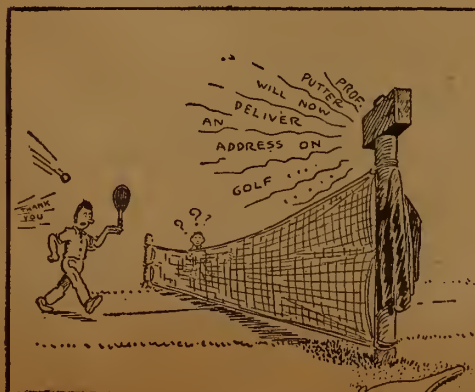
CHICAGO.—The city council here, by adopting a resolution, requested Mayor Dever recently to appoint a commission of four aldermen and five civilians to make it possible for Radiophans to get more enjoyment out of tuning in.

Alderman Arvey claims the rapidly growing number of powerful local broadcast stations have wave lengths so close together that the great majority of people have to listen to one station until its program is complete or listen to two or more programs at the same time.

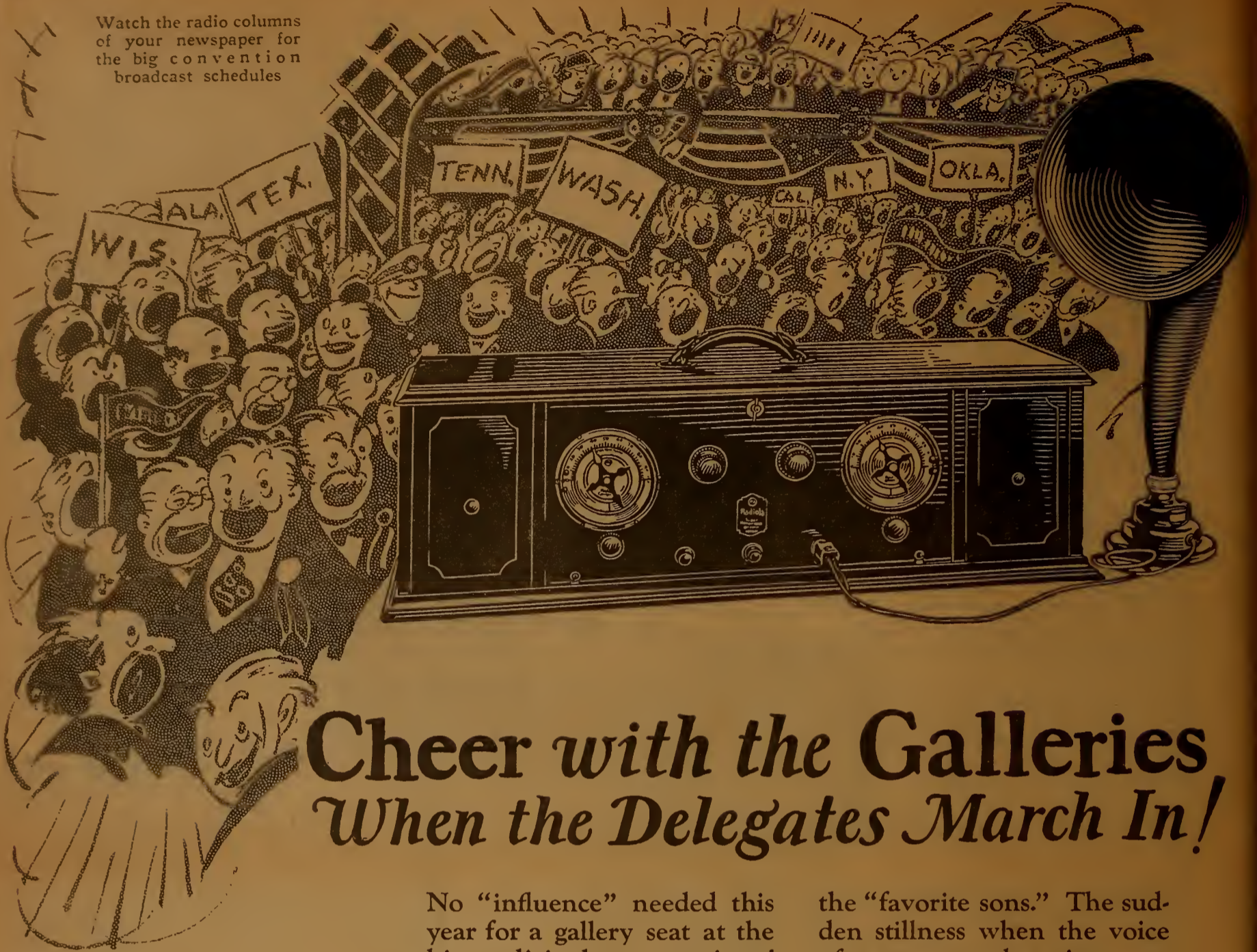
THE ANTENNA BROTHERS

Spir L. and Lew P.

Untimely Suggestions



Watch the radio columns of your newspaper for the big convention broadcast schedules



Cheer with the Galleries When the Delegates March In!

No "influence" needed this year for a gallery seat at the big political conventions! Get it all with a Radiola Super-Heterodyne.

the "favorite sons." The sudden stillness when the voice of a great speaker rings out. The stamp and whistle and shrill of competitive cheering. Hear the actual nomination of a president.

When the delegates march in — their banners streaming; when the bands play and the galleries cheer—be there with the "Super-Het." Hear the pros and cons as they fight their way to a "platform" for you. Hear the speeches for

It used to be all for the delegates' wives and the "big" folks of politics. Now it's for everybody. Listen in. Get it all with the newest Radiola.

Radiola Super-Heterodyne

is the great Radiola for the big events of summer broadcasting. Listen in, at your office to the conventions and the ball games. Take it everywhere. It needs NO ANTENNA—no ground—no connections of any kind. Has a handle to lift it by. Tunes in with just two knobs that you turn to marked spots on the dials. Tunes out powerful near stations to get the far ones. A wonderful new achievement in the perfection of its tone—its sensitivity — and its supreme selectivity!

Complete with six Radiotrons UV-199 and Radiola Loudspeaker; everything except batteries \$286

External, rotating loop, easily assembled, larger than self contained loop in Radiola Super-Heterodyne, for extreme reception range. Loop A G. 814 \$12.00

Operates on Dry Batteries



This symbol of quality is your protection.

"There's a Radiola for every purse."

Radio Corporation of America

233 Broadway, New York

10 So. La Salle St., Chicago, Ill.

433 California St., San Francisco, Cal.

There are many Radiolas at many prices. Send for the free booklet that describes them all.

Radiola

REG. U. S. PAT. OFF.

RADIO CORPORATION OF AMERICA

Dept. 316 (Address office nearest you.)

Gentlemen: Please send me your free Radio Booklet.

Name _____

Address _____

BEFORE THEY THOUGHT OF "MIKES"

No, the two boys in the circle inserts are not twins. What's more, their stations are fifteen hundred miles apart. Left circle is J. D., on the coast, and right is an announcer whose station has recently been changed under him. But he still directs and announces. If you're still in doubt, watch next issue for complete details giving their names and pasts.



The solemn lad in the circle last week was none but George D. Hay (right), "The Solemn Old Judge" of WLS, ex-WMC.

H. M. Milholland (left), KGO, looks different wearing a few more years and formal clothes than he possessed last week.

George D. Hay, WLS

POSSESSING a wrinkled brow since he was tall enough to discard short skirts for jumpers and enroll in the kindergarten at Attica, Indiana, "The Solemn Old Judge" of the Sears, Roebuck agricultural foundation station in Chicago has earned the odd descriptive appendage through twenty-eight years of experience, including the toting of an eighteen-pound rifle in the late disturbance started by the kaiser.

Though but seventy inches high, the directing announcer who formerly called the stops for WMC, Memphis Commercial Appeal, appears to be much taller owing to his slight build and willowy fashion of standing.

Questioned along the lines of Lambdin WSB Kay's perfect questionnaire for an-



nouncer-interviewing, the tabulation becomes:

Hair: dark brown and plenty, natural marcel; eyes, sweet blue; habits, terrible; servitude, married successfully, two offsprings, both girls; favorite recipe, gingerale and anything else; hobby, sleep, of which there is never enough; politics, same as the boss; ideal, J. P. Morgan; ambition, one cool million cash; experience, born in Attica, Indiana and lived there till the tender age of ten years, then accompanied proud parents removing to Chicago where he learned what there is to learn in the Windy City; left in 1918 to show the U. S. Army how to win the war, after winning which he connected with the Memphis Commercial Appeal where he originated and conducted a famous column known as "Howdy Judge," based chiefly on what occurred in the Memphis police court. From Memphis he migrated to Atlanta for a short time, then back to Memphis. When the Commercial Appeal decided to inject 500 more watts into the ether, the Solemn Old Judge began to get famous, and has been getting "famouser" every day since.

H. M. Milholland, KGO

STATION KGO, H. M. Announcing. Millions have heard that. It's snappy and professional-like. But while "H. M." is an old timer in the announcing field there was time in his career as an announcer when he was not so widely known.

He was one of the loudest and most earnest announcers in Roodhouse, Illinois, where he was born. Announcing the weak points about safety-pins and the disadvantages of colic, from a baby's point of view, was his specialty at that time.

In his fourth year he announced to the congregation of his daddy's church that he had on a new pair of pants. It shocked his daddy, who was unaware of

the presence of his small son right down in front of his pulpit.

A few years later he announced to a

minister, a charming young lady, and others that he "would." The lady's name is now, of course, Mrs. Howard Milholland.

Look at him today. He is the chief announcer and studio manager of KGO, the new Pacific Coast Station of the General Electric Company, Oakland, California—announcing to half the continent.

"I like announcing," he said philosophically, "it's the most natural thing a man can do—even if we do think we are original sometimes."

Then he smiled and announced that he very much enjoyed "announcing KGO programs that give so many people entertainment and instruction." He meant it, too.

Recently a dear old lady wrote: "Dear H. M., when you say good night it sounds so natural I always say 'good night' right back to you." And that's that.

Colleges Shut Off Power for Summer

Five University Stations Close Down During Vacation Period

CHICAGO.—Broadcasting stations operated by or in connection with universities and colleges are for a large part closing down for the summer vacation period. Among those included in recent notices of going off the air temporarily are:

Station WCAL, St. Olaf College, Northfield, Minn.; WBBF, Georgia Institute of Technology, Atlanta, Ga.; WPAB, Pennsylvania State College, State College, Pa.; KFGE, University of Washington, Pullman, Wash.; WBAA, Purdue University, W. Lafayette, Ind.

Many others, reports from which have not yet been received, will be silent while college vacations hold forth. Listeners are warned not to discount their receivers because they cannot hear their Alma Mater during this time.

Pick Twelve Radio Dramas

SCHENECTADY, N. Y.—From three hundred manuscripts submitted in the WGY Radio drama contest twelve plays altogether have been selected for production by the WGY Players. Special prizes have been awarded the authors.

La Presse Gives Ilo Lessons

MONTREAL, CAN.—La Presse, famous French daily newspaper here, has begun a series of lessons in Ilo, said to be the perfect international language and Radio auxiliary. La Presse owns Station CKAC.

NOMINATION CERTIFICATE

Announcers' Contest

Radio Digest First Annual GOLD CUP AWARD

GOLD CUP AWARD Editor, Radio Digest, 510 N. Dearborn St., Chicago, Ill.

Dear Sir:

I nominate

Station Broadcasting Station

Signed

Address

Town State.....

BRISTOL SINGLE CONTROL RADIO RECEIVER

This set is completely equipped to use Loud Speaker. The well-known Bristol One Stage Power Amplifier is incorporated as the last stage of amplification. The Bristol Single Control Radio Receiver is designed to get satisfactory results with Antenna or Loop, and in most cases short antenna.

The case is solid mahogany walnut finish. A suitable piece of furniture for the finest home.

The price of Bristol Single Control Radio Receiver is \$190.00. This does not include accessories such as tube, battery, and Loud Speaker.

AUDIOPHONE LOUD SPEAKER

A Real Reproducer of the Original Broadcasting

It is easy to listen to the Audiophone reproductions because they are so perfect. The speech, songs and instrumental music are not blurred or disguised by mechanical distortion.

No auxiliary batteries are required for magnetizing. Made in three models—Senior \$30.00, Junior \$22.50, and Baby \$12.50.

THE BRISTOL COMPANY
WATERBURY, CONN.

CROSS OCEAN PHONE GIVEN BRITISH OKEH

COMMITTEE RECOMMENDS 200-KILOWATT PLANT

Erection of Station Means Two-Way Talks on Land Wire Phones with English

(Continued from page 1)

giant plant which is an outgrowth of a successful trans-Atlantic demonstration made in January 1923 by the American Telephone and Telegraph company and the Radio Corporation of America, in cooperation. At this time speech was transmitted for two hours from New York to London while a British post office committee observed.

Use of Service to Perfect Itself

While it is hoped that the large station will be able to maintain trans-Atlantic Radiophone communication at all times, it is believed that unfavorable conditions at times may disrupt the service. The difficulties, however, will be eliminated as fast as they present themselves, once service has been established.

The tests which will be possible when the British transmitting station is completed will form another important step in the work which has been carried on for many years in the development of Radiotelephony across the Atlantic ocean.

The first successful telephone transmission across the Atlantic was in 1915, when engineers succeeded in talking by Radio from the United States naval station at Arlington, Virginia, across the Atlantic to Paris, while the same messages were heard 5,000 miles to the westward at Honolulu.

Tests Made in January 1923

Another step in this work which created much interest took place January 14, 1923, at which time H. B. Thayer, president of the American Telephone and Telegraph company, and other officials, talking from their offices in New York city, were heard by a group of well-known engineers and laymen assembled at New Southgate, England.

The tests were very successful. The voices were clear, distinct and easily recognized by the men at the receiving end who were acquainted with the speakers. The circuit remained constant during the two hours during which speech was transmitted. Reception was carried out a part of the time through loud speaking devices, and reporters present took down many of the messages verbatim.

What British Plant Will Mean

The tests which have already been carried out and the additional tests to be made if the new British station is erected, will determine the practicability of trans-Atlantic telephone service, the best operating methods to be employed, and the attitude of the public toward such a service.

The difficulties to be overcome are indicated by the fact that atmospheric conditions often change so greatly that the amount of power required at one time may be 10,000 times as great as that required to give audible speech in England a few hours before.

Briefly, the news from London indicates that preparations are under way for transmission from London to New York, and that when completed two-way talking, at least experimentally, will be possible.

QUEEN TITANIA AT KHJ

(Continued from page 1)

participants has not been divulged, consequently "Queen Titania" has become known as "The Mystery Child of Radio." It is known, however, that at the time the program was commenced that "Queen Titania" in her earth-child form was less than seven years of age.

Selected As Child Movie Star

Recently a new motion picture company was formed in Hollywood to produce for the silver sheet. None but children are to be featured in the making of the productions. They will make comedies dealing strictly with child life, revealing it in all of its clean, sweet phases.

Ivan Kohn, director general of the new company, is an ardent Radiophan. As a result of hearing her voice, he has chosen "Queen Titania" of KHJ fame to head the group of children. She is now being featured in the first of eighteen two-reel comedies which will be made during the year.

All hail Radio and likewise thanks to Station KHJ and "Uncle John" who discovered and is bringing out into full unfoldment, another new star whose radiance shall add luster to both Radioland and the silver sheet.

Hams Meet; Start "R. O. S."

CHICAGO.—The first strictly Illinois state convention of "brass pounders" was held recently at Wheaton near here by the A.R.R.L. second Illinois district. An attendance record of 165 owners of amateur stations was set and a new secret order for amateurs, "R. O. S.", was launched.

One thousand wholesale concerns are engaged in the distributing and jobbing of Radio sets and parts.

What Good Ideas to Improve WIP?

Gimbel Brothers' Station Offers Seven Prizes for Best 1,000-Word Essays on Subject

PHILADELPHIA.—WIP, Gimbel Brothers here, has opened a prize essay contest to determine, "How to Improve the Radio Broadcasting of Station WIP." Seven prizes are offered.

The essays, which must be submitted by midnight, August 31, 1924, are limited to 1,000 words length, and must be written in ink or typewritten on one side of the paper only. Contestants must indicate their age and whether they attend high or grammar school, or are adults.

Prizes for the winning essays in the contest, which is open to everyone except employees of Gimbel Brothers, include two receiving sets, two gold watches, one platinum and gold wrist watch and two gold fountain pens.

Judgment of the winning essays will be made on a basis not only of quality of the composition, but on the worth of the suggestion made.

KGO Opens San Francisco Studio

OAKLAND, CALIF.—Program resources of KGO here, Pacific coast station of the General Electric company, have been greatly increased by the introduction of a San Francisco studio at the Hotel St. Francis. The new studio was opened recently with an address by Ralph McLaren, acting mayor of San Francisco.

LAWMAKERS LEAVE BUT NEGLECT RADIO

CONGRESS ADJOURNS WITH WHITE BILL PENDING

Dill Bill Also Left in Air—Politics More Important to Representatives of Public

WASHINGTON, D. C.—Congress adjourned on June 7 without having taken any action on either the White Radio bill, the Dill bill, or the various other copyright bills pending, of interest to Radiophans.

When Representative White, of Maine, returns from Mexico, where he is attending the communications conferences as an official representative of the United States, he will probably feel that he has been double-crossed by Representative Snell, of New York, chairman of the rules committee of the House. Mr. White left the country with a complete understanding that Mr. Snell would see that a special rule was reported out of the committee and that the Radio bill would be passed by the House at the session before it adjourned in June.

Disagree on Bill's Provisions

This plan would probably have been carried out except for the fact that several members of the rules committee would not agree to certain provisions contained in the bill. At any rate the White bill will be on the calendar when Congress convenes again in December.

The patents committee of the Senate never went any further with the Dill copyright bill than to have the hearing printed. No report was ever made to the Senate proper. Neither did the patent committee of the House make any report on any of the copyright bills pending before it.

All of the bills, however, will be before the Congress again when it convenes in December as that will not be the opening of a new Congress but simply the second session of the sixty-eighth Congress.

National conventions and politics, in the eyes of the lawmakers, are more important than a proper administration of Radio.

KDYL to Broadcast Meet Direct from Mormon Church

SALT LAKE CITY.—KDYL here will broadcast the convention of the Disabled American Veterans of the World War, opening June 23 in the famous Mormon Tabernacle here. A musical program, in addition to the speeches, includes songs by Mme. Schumann-Heink.

The June 24 to 28 sessions will take place in the Auditorium. Radiophans are expectantly awaiting the broadcast from the Mormon Tabernacle, which is known all over the world for its excellent acoustics.

Standardize Dry Cells

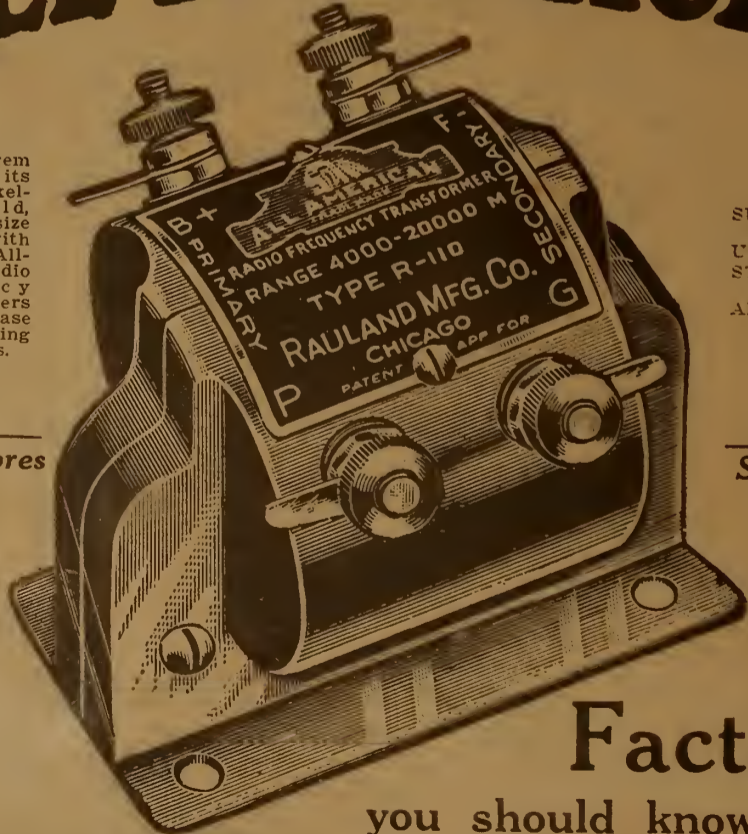
WASHINGTON.—At a recent conference held at the bureau of standards it was provided that a committee should be appointed to devise standard designations for the various types of dry cells.

GET DX THROUGH NEARBY STATIONS

With the New Long Wave Radio Frequency Type R-110



ALL-AMERICAN



It's a little gem of beauty in its rounded nickel-plated shield, identical in size and shape with the famous All-American Audio Frequency Transformers to insure ease of mounting and neatness.

For All SUPER HET-ERODYNE ULTRADYNE STRAIGHT R. F. AND REFLEX CIRCUITS

At All Stores

Six Dollars

Facts you should know—

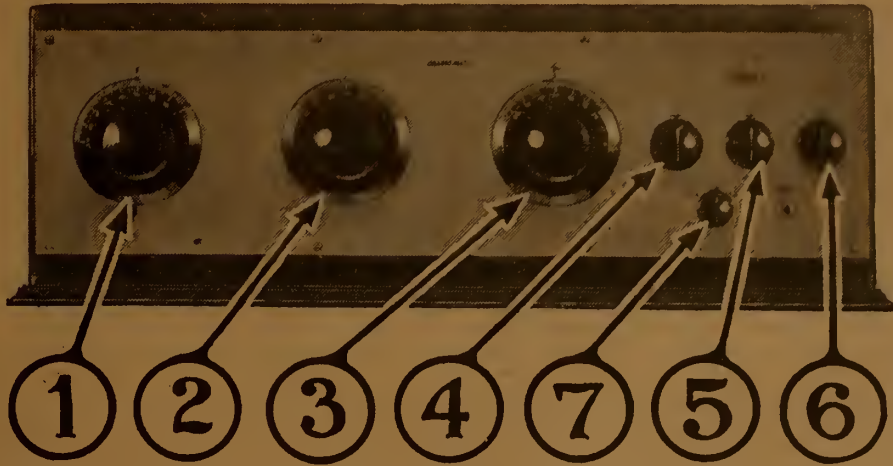
- Why the All-American leads: (1) Highest amplification, without distortion, of any transformer on the market; for wave lengths 4,000 to 20,000 meters. (2) Quiet in operation; shielded to prevent inter-stage coupling or reaction. (3) Stable; free from any tendency to oscillate. (4) Windings specially designed to eliminate capacity; properly treated to exclude humidity. (5) Every transformer "circuit-tested" for accuracy and precision to insure uniformity and highest efficiency. (6) The best long wave transformer that can be made. Fully guaranteed. All the better dealers recommend the All-American.

OPERATING AND TROUBLE SHOOTING

For the Owner of a Deresnadyne Receiver

"OPERATING and Trouble Shooting" is a Radio Digest feature whose purpose is to study the late models of various standard receiving sets and to show the newly initiated broadcast listener, who has purchased such a set, how he can operate it to get the best there is in it and how he can overcome minor difficulties which may be causing some trouble. On page 7 and 8 this week the Deresnadyne Receiver is described. Radiophans with other sets will also find these articles worth while reading, particularly the notes on trouble finding.

FIVE UV-201A or C-301A tubes should be used in the Deresnadyne. A UV-200 or C-300 tube can be used in the detector socket if desired, but the A tubes are generally found to be just as satisfactory and consume less current. A loud speaker should be used which is capable of handling a signal of great volume without blasting. Small, cheap loud speakers, using a standard head phone unit may cut down the performance of the Deresnadyne quite appreciable. A good plug should be used to connect the loud speaker into the jack marked speaker. Much trouble is sometimes caused by a cheap, poorly insulated plug which short circuits. It sometimes improves results to try different tubes in different



sockets, as some A tubes are better Radio frequency amplifiers than others and will work better in the first or second socket. Others are better detectors. When a combination is secured giving maximum results, mark the tubes and always put them back in the same socket.

Connecting the Batteries

The battery connections are made to the five binding posts located on the sub-panel at the right rear corner of the set. Bushings are provided in the back of the set through which the battery leads are brought in to the binding posts. The negative wire from the A battery should connect to the right hand binding post marked A minus. The positive wire from the A battery is connected to the next binding post marked A PLUS. The negative wire from the B battery connects to binding post marked B MINUS. When a 201A or 301A tube is used as a detector, the positive 45-volt terminal of the B battery is connected to the binding post marked PLUS B DET. The B voltage is not critical on these tubes and may range anywhere from 22½ to 45 volts. A slight improvement may be obtained by trying different voltages between these limits, although this is not at all necessary to satisfactory operation. If a 200 or 300 tube

is used as detector, from 16 to 22 volts should be used on the terminal marked B PLUS DETECTOR. It is desirable in the case of the soft detector tubes to determine the best voltage by test. The 90-volt positive terminal of the B battery should be connected to the binding post at the extreme left of the sub panel marked PLUS B 90.

Antenna and Ground

The ground should be connected to the binding post on the small sub-panel in the center marked GND. It is quite important to have a good ground. A wire fastened firmly to the clean surface of a cold water pipe is the best, but a steam pipe will do. Also an iron pipe driven into moist earth or a wire laying for a con-

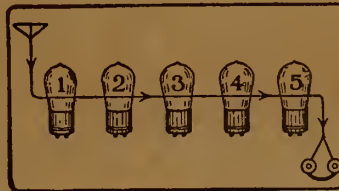
siderable length in water, such as in a lake, creek or well, can also be used. The lead from the ground to the set should be kept as short as possible. The antenna should be connected to the binding post on the small sub-panel at the left of the set, marked ANT. A single wire is all that is necessary. This should be as high as it can be made conveniently and may be from 50 to 100 feet long. The longer aerial gives stronger signals but is less selective. While a shorter antenna gives greater selectivity but less signal strength. If an antenna can be arranged so that it runs over clear ground, it is better than one which runs over the top of a house, however, very good results can be had with aerials running over the top of houses or even inside the attic, or the room in which the set is located. Twenty-five feet of wire strung on the floor will sometimes give excellent results providing the location is suitable and no large masses of iron are in the building. The outside antenna is preferable, however. The lead-in should be as short and direct as possible and the antenna and lead-in should both be thoroughly insulated.

Operation

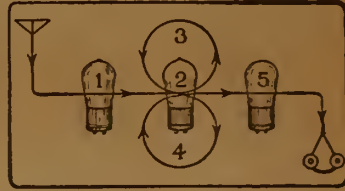
The small knob, No. 7, at the bottom of the set on the right hand side controls the filament current of the tubes and also switches from the first stage to the second stage. When the arrow on this knob points toward the word OFF, the current is cut off from all the tubes. The switch should always be in this position when the set is not in use. When the arrow points to SOFT, the current is turned on in the first four tubes and one stage of amplification is connected to the speaker. When arrow points toward LOUD, the current is turned on to all five tubes and

(Continued on page 8)

Why Use Five Tubes To Do the Work of Three?



Three tubes, duo-reflexed as shown at the right, are fully equal to five tubes in conventional sequence.



GREBE

INDIVIDUAL SHIELDS

"The Sage attends to the inner and not to the outer."
—Lao Tzu

The wise buyer of a radio receiver is not misled, he looks inside the cabinet.

Doctor Hux

Grebe Regenerative Receivers are licensed under Armstrong U. S. Patent No. 1,113,149, Oct. 6, 1914

CLOSE inspection of many regenerative receivers reveals but one large shield to prevent body-capacity effects. The Grebe engineers believed that this method resulted in the absorption and dissipation of too much precious energy.

As a result of their research, each tuning control on a GREBE Receiver has its own aluminum shield of special size and shape.

This is just one of many details of craftsmanship which make for the high efficiency of Grebe Receivers.

A. H. GREBE & Co., INC.
Richmond Hill, N. Y.

The most important advance in coupling methods of late years is Erla Selectoformer, materially improving range, selectivity and volume. \$5

Unduplicated sensitiveness, range and volume, from 200 to 700 meters, are assured through employment of Erla reflex transformers. List \$5

Erla Push-Pull transformers handle output of five-watt power tubes, using as high as 350 volts on the plate, without distortion. Pair \$10

FIVE stages of amplification with only three tubes—this is the secret of the amazing coast-to-coast loud speaker range of the Erla three-tube Duo-Reflex circuit, surpassing all but the most elaborate hook-ups in sensitiveness and volume.

Erla Duo-Reflex action (patent applied for) enables vacuum tubes to do triple duty, as simultaneous amplifiers of received radio frequency, reflexed radio frequency and reflexed audio frequency currents, tremendously increasing efficiency while reducing cost.

Indispensable to the practicable application of this principle, and the foundation of its success, are Erla synchronizing radio and audio transformers.

Accurately superimposing (1) received and reflexed radio, and (2) rectified radio and reflexed audio currents, in their coincident passage through amplifying tubes, they eliminate all trace of distortion. Only those who have actually heard Erla performance can realize the vast improvement in tone quality resulting.

Other Duo-Reflex advantages, for example, the fool-proof tuning control, giving an accurate log of stations together with complete freedom from radiation, have equally scientific origin.

Erla Selectoformer, tested capacity condensers, and fixed crystal rectifier spell outstanding advancement in their respective fields.

Ask your jobber for complete details; or write, giving your jobber's name.

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

ERLA

AN EVENING AT HOME WITH THE LISTENER IN

(SEE INSTRUCTIONS FOR USE BELOW)

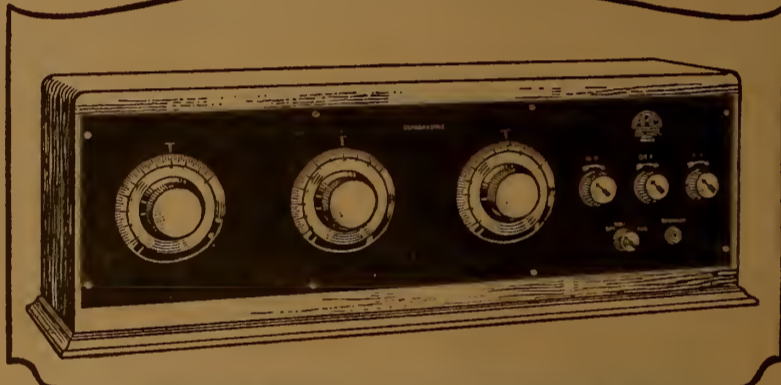
Table with columns for Station and City, Met., Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday. Lists various radio stations and their broadcast times.

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 broadcasts, 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 station call letters and their corresponding wave lengths.

points closer to 0. *When a signal is heard, adjust dial 1 until the signal is loudest, then adjust dial 3 to increase the signal strength and finally adjust dial 3 to secure the maximum strength of signal. When a station is heard, a record should be made of the setting of each dial, the same station will always be found substantially the same position. If there is a tendency for the set to whistle, or distort, on stations toward the O end of the scale, this can be corrected by turning the knob No. 4 in the opposite direction to the curved arrow, until the whistling ceases. A slight readjustment of the three large dials may help after the RF knob has been retarded. The knobs Nos. 5 and 6, marked DET and AF should be operated with the arrow on the knob as far toward the tail of the curved arrow as possible consistent with securing the desired signal strength. This saves current and also increases the life of the tube. When changing from the SOFT to the LOUD position, on the small knob No. 7, it may be necessary to turn the knob No. 6 in the direction indicated by the curved arrow, otherwise the signal may become weaker in going from SOFT to LOUD instead of the reverse, due to the cutting down of the current in the audio frequency tubes by adding the fifth tube to the circuit. (How many of you own Trans-Continental Radiophone receivers? "Operating and Trouble Shooting" will tell how to set up, tune and find trouble with this compact outfit. The set is one that employs a loop aerial and is especially adapted therefore to summer reception.—Editor's Note.)



THE ANDREWS DERESNADYNE*—Patents Pending

The CHICAGO DAILY NEWS says:

"DERESNADYNE* FILLS CLAIMS OTHERS MAKE

Tests Reveal Qualities of Crystal Set and Volume of a Superdyne"

"To say that the Deresnadyne is a better circuit than the neutrodyne would be scarcely a compliment. But to say that it is the best thing of its kind that has found its way to The Daily News laboratory would be giving it no more than its due."—Robt. J. Casey.

Write for reprints of the Deresnadyne* articles from the Chicago Daily News, also, personal endorsement of Robert J. Casey, technical editor, Daily News laboratory. The only unqualified endorsement given by the Chicago Daily News to any radio set.

A New Achievement

The DERESNADYNE* principle introduces a new standard in radio reception. It eliminates troublesome oscillation at its source, stabilizing the circuits without the use of special apparatus which suppresses and distorts the signal to be amplified.

Simplicity—Tone—Volume

The ANDREWS DERESNADYNE* principle achieves a quality of radio broadcast reception never before attained. It reproduces all tones with true fidelity, remarkable purity, and if desired, with tremendous volume. It is highly selective, with a super-sensitive reach for far distant signals. Its simplicity is amazing! Just turn the dials to the logged setting for any particular station and your loud speaker will deliver the signal with an unsurpassed volume and an unequalled tone quality. For demonstration or further information, address the

before attained. It reproduces all tones with true fidelity, remarkable purity, and if desired, with tremendous volume. It is highly selective, with a super-sensitive reach for far distant signals. Its simplicity is amazing! Just turn the dials to the logged setting for any particular station and your loud speaker will deliver the signal with an unsurpassed volume and an unequalled tone quality. For demonstration or further information, address the

*PRONOUNCED DERES-NA-DYNE, stands for a deresnadyne-ated plate circuit or reduced inductance in the transformer primary so that the plate circuit is not resonant to the signal being received. In other words, securing stability through proper proportioning of the various circuit values.

ANDREWS RADIO COMPANY 506-7 Webster Bldg. Harrison 0017 CHICAGO, ILLINOIS

Exclusive territory in your locality to foremost jobbers and dealers only.

OPERATION, TROUBLES

(Continued from page 7)

the loud speaker is connected to the second stage of amplification. To operate the set, see that the loud speaker plug is in the jack marked SPEAKER, then turn the small knob, No. 7, of the set to SOFT or LOUD. Turn the knob No. 4 as far as it will go in the direction of the curved arrow, turn the knob No. 5, marked DET so that detector tube just lights, if a 201 or 301A tube is used. If a soft tube is

used, this knob will have to be turned well around in the direction indicated by the curved arrow until a slight hiss is heard in the phones or loud speaker. Turn the knob No. 6 marked AF until the white arrow is horizontal pointing to the right. Now set the large dials marked 2 and 3 to 100 and rotate dial 1 slowly for a short distance on each side of this figure. Then set dial 2 and 3 at 95, again rotating dial 1 slowly on both sides of this point. Proceed in this way setting dial 2 and 3 to the same figure, each time working a few



They're like Buckin' Bronchos

—YOU CAN'T BREAK 'EM!

A new Walnut Socket free for every one that breaks or fails in any way! You write your own ticket. Leading set manufacturers use them because they don't break and have lower dielectric losses than bakelite, fibre or composition sockets.

WALNART SENSIBLE SOCKETS

Approved by Radio News Laboratories. Over half a million doing duty. Features: Bakelite insulation; heavy, genuine phosphor bronze contact springs; low resistance; high elasticity (to insure perfect contacts). Nickel or dull black enamel finish. For base or panel mounting. Unconditionally guaranteed by world's largest producer of unbreakable sockets. Trial will convince. Ask your dealer first, please.

"Makers of good goods only" WALNART ELECTRIC MFG. CO. Dept. 440 Chicago

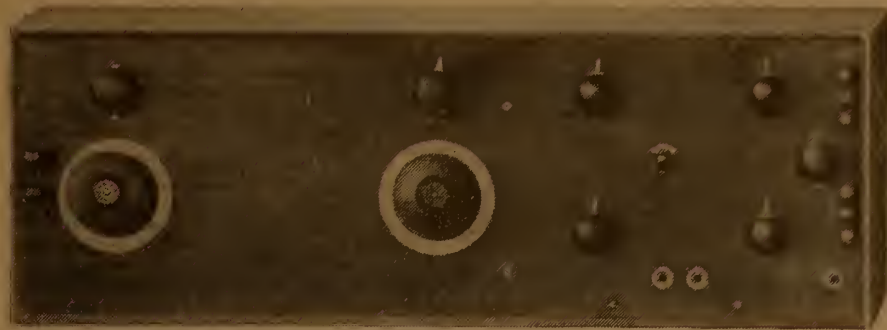
Compact Nine-Tube Super-Heterodyne Set

Part III—Assembling, Shielding and Cabinet Construction

By Harry Abbott

GOING to the other end of the board, connect the tuned transformer consisting of the two 1000-turn coils, to the plus B, grid of first Radio frequency tube and plate of the first detector. The two .00025 mfd. fixed condensers are soldered to the bus wires leading from these coils. Short flexible leads must be attached to these coils so that they can be adjusted. At this time the plate and grid of the oscillator can be connected by bus bar wire and flexible wires to the oscillator coils and the grid coil connected to the minus A wiring.

You are now ready to attach the panel to the baseboard by means of five long, flat-head wood screws through the five holes across the bottom of the panel. This should be done with some care making sure that the board and panel are at right angles to one another as otherwise the panel will not fit well when the two are slipped into the cabinet. Having gotten them together you can now complete the wiring at the right end; the rheostats to the tubes and the plus lead connected to its proper binding post, Number 3 from the top. The jacks and transformer wiring can be completed and the two amplifier grid returns brought to Number



the plus 45 and the inner end of the other to the potentiometer. Reference to the wiring diagram will make this clear.

Shielding

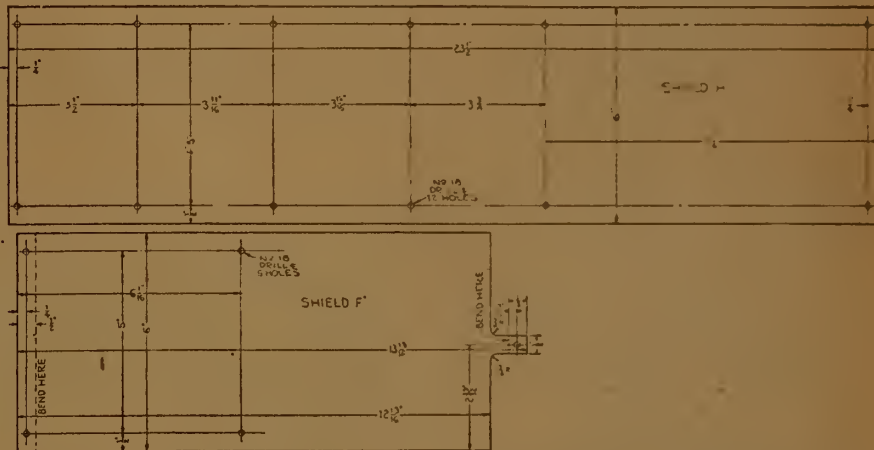
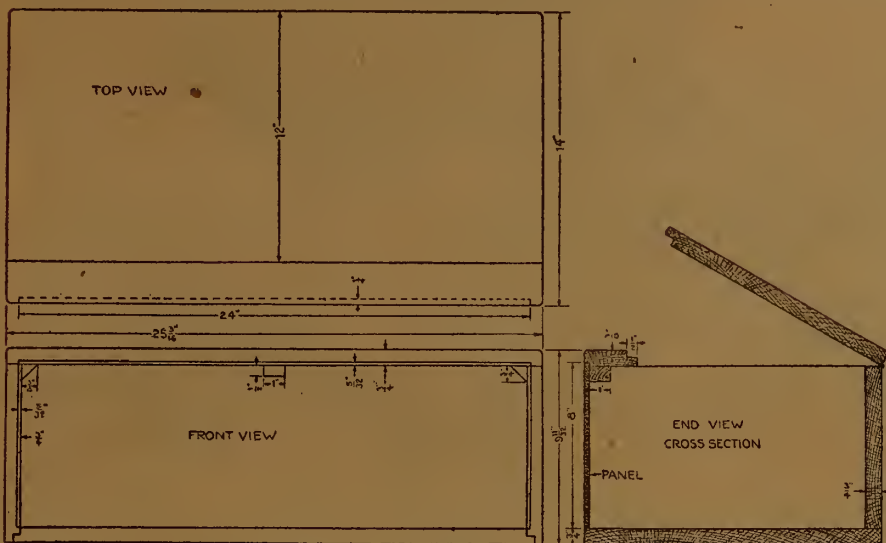
Before proceeding with the shields, go over carefully all the wiring you have done, checking it carefully against the wiring diagram and looking out: First, to see that no B battery wires are liable through jarring or slight pressure to touch the filament circuit; second, to see that no grid and plate wires run parallel

adding the B battery will not blow anything.

The shields can be made of either sheet aluminum of number 24 gauge, obtainable

holes may be omitted if copper is used. All shields with the exception of F and J are regular in shape and no difficulty will be encountered in laying them out directly on the metal itself. Shield J will cause but little trouble, but for F it is advisable to draw a paper pattern for the irregular end and draw around it on the metal. Care should be used in making this, as it is essential that the 1/2 inch extension holding it to the panel come directly under binding post Number 4, which is the minus of the A battery, and to be fastened by it.

Shields J, G and F can now be bolted to the panel with flat-head brass machine screws; the remaining shields should now be fastened together, either with round-head machine screws or solder, depending on the material of which they were made. The resulting structure should now be lowered gently into place (the batteries



in strips 12 inches wide, or of copper. If the former is used, the holes in the flaps of the shields will have to be drilled and small brass, round head machine screws used to bolt the sections together. Copper can be readily soldered so the

all having been previously disconnected) and permitted to rest on the various wires which pass beneath it.

Battery Connections

The plus A battery wire to all tubes in (Continued on page 10)

5 binding post, the detector plate circuit to the Number 1 binding post, and the two amplifier plate circuits to the Number 6 binding post at the bottom.

Having completed all the close-to-the-panel work at the right end, you can now move to the left end and connect the first grid lead to the first detector and the tuning condenser to the "pick-up" coil of the oscillator coupler. Next take up the oscillator condenser, coupler and tube socket, not forgetting the fixed condenser across the plate and filament of the oscillator tube. The tuned transformer can now be connected to the grid return leads of the intermediate amplifiers and to the potentiometer. In connection with this work it should be mentioned that the outside ends of the coils go to the plate and grid of their respective tubes, the inner end of one being connected to

if within 2 inches of each other; third, that wires passing under shields A, B, C, D, E, F and G are close to the baseboard and well covered with spaghetti. Now test your filament circuit by inserting the tubes and connecting the A battery to



see that all light and are properly controlled by the rheostats. Leaving the tubes in, shift the A battery to the various pairs of binding posts intended for the B and C batteries and if the tubes do not light, you can be pretty sure that

*Simple Tuning
Three Controls*

*These to produce
Exceptional tone
refinements*

IT HAS been the tradition of the Federal Company, over its 25 years in manufacturing Electrical Communication Equipment, that it must give its users the highest refinements of the art.

Federal tradition will not permit the manufacture of a radio set just for radio noises. Each and every manufacturing necessity to produce a harmonious set is known to Federal Engineers, and no Federal set is produced without them.

Federal radio sets are built with two thoughts in mind—first: simplicity of operation, but three controls being necessary—second: special controls for refinement if the user is interested in reproducing all the beauty of tones that fill the air.

"Lovers of good music" know why Federal is better, and know the real value of the refinement placed at their command to make it easy to obtain the clearest tone reception.

FEDERAL TELEPHONE & TELEGRAPH CO.
Buffalo, N. Y.

Federal

Standard RADIO Products

Boston
New York
Philadelphia
Chicago
Pittsburgh
San Francisco

Bridgeburg
Canada
London
England

Look for this sign

Standard RADIO

Audio Amplification at a Popular Price

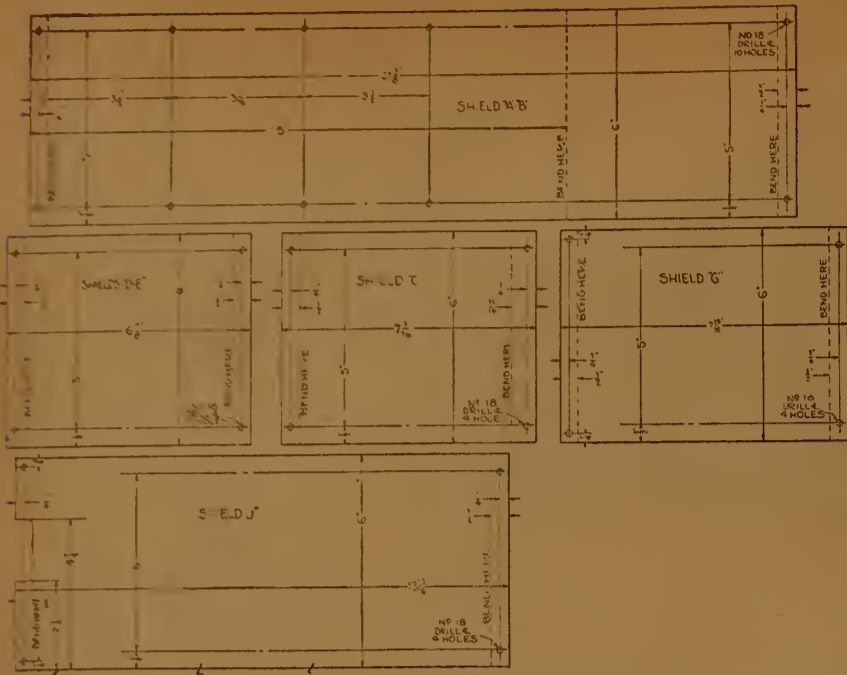
The volume and clearness of amplification of this HALF PRICE transformer is always a pleasant surprise to users. Many have written us that they prefer their 3 to 1 ratio Coto Specials to others selling at double the price.

Great for reflex circuits.
Type 4500..... **\$2.50**

If your dealer fails you, write us, giving his name and address, and list of Coto parts you need.

COTO-COIL CO.
87 Willard Ave., Providence, R. I.

BRANCH OFFICES:
Los Angeles, 329 Union League Bldg.; Minneapolis, Geo. F. Darling, 705 Plymouth Bldg.; Atlanta, C. P. Atkinson, Atlanta Trust Co. Bldg.; CANADA, Perkins Electric Co., Ltd., Montreal, Toronto, Winnipeg.



NINE-TUBE SUPER

(Continued from page 9)

The front row will pass under shields G and F, there will be a wire from rheostat W to the oscillator tube which will follow around under shield A, shield C, shield D and shield E. Under shield G will also pass the wire from rheostat X to the first detector tube, and the wire from Number 1 binding post at the right will go under shield F and under shield G to the tuned transformer. Thus there should be four passing under shield G, and two to five under each of the other shields except J and H.

Using either a pencil or a pointed instrument make a small mark near the bottom edge of shields where wires pass under and when all are so marked, lift off the shields and cut small inverted V's at each mark in the bottom edges. There will be five under shields C and D, the plus A battery wire at the rear, the minus A at the middle, the plus B next to it and

forward, the wire from each transformer to the following grid, and near the front will be the grid return lead. Shield E will have but four notches, as the grid return lead from the transformer in front of the fourth intermediate tube goes to the plus filament wire and not to the potentiometer. The wire from the G binding post on that transformer passes under shield A close to its juncture with shield F and up to the grid leak on the panel at the right end.

Reference to the diagram will make clear how certain wires come outside of shield F and up to the binding posts. About 1 inch from the rear, the plus A battery wire comes through from the rear row of tubes and up to Number 3 binding post; 2 inches in front of that the plus B comes out and up to the Number 2 binding post; just in front of the point where shield A joins shield F, the plus A battery wire from the front row of tubes comes out and is soldered to the first A battery wire; about 3 inches back

from the panel, the plus B battery from the audio frequency amplifier jacks comes through to go to Number 6 binding post, and the plus B 45 volts comes from the detector jack and the first detector, to be bent up to the Number 1 post. The minus C battery wire comes through to go to Number 5 binding post.

A little adjusting of the shields and slight enlarging here and there of the notches will be found necessary and the shields will rest on the baseboard, not touching any apparatus and clearing all wires by a sixteenth of an inch. Again the tubes should be inserted and the A battery connected, first to its own posts when the tubes should light, and then to the B battery posts when the tubes should not light. The set is now ready to try out.

Tuning

Connect the three sets of B battery, the C battery and the A battery and plug in on the detector jack at the right end of the panel. The loop should, of course, be connected at the other end, with the outside end of the loop to the grid side of the tuning condenser. The initial tun-

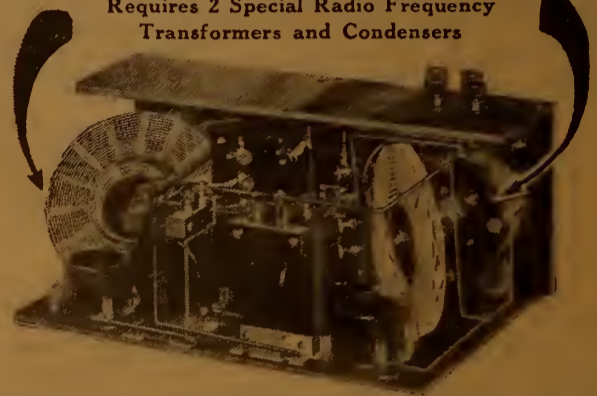
ing of a "super" is quite an adventure. The tuning condenser should be set at 5 and the oscillator condenser should be swung through its scale very slowly. If no signal is heard, move the tuning condenser to 10 and again go slowly through the scale on the oscillator condenser. This process of co-ordinating the dial settings must be done until three or four stations have been heard that a scale may be made.

The potentiometer is an important device on this set. When it is on one side of center, the whistles will be heard as one swings through the scale; on the other side, there is absolute silence. As you turn the potentiometer knob from the whistling side past center, a click will be heard which denotes that you have brought the intermediate amplifier out of the oscillating state into the proper condition for reception. It should be set at the point, on the quiet side, just after the click is heard, at which point the benefits of slight regeneration are secured.

With the potentiometer set and a signal (Continued on page 18)

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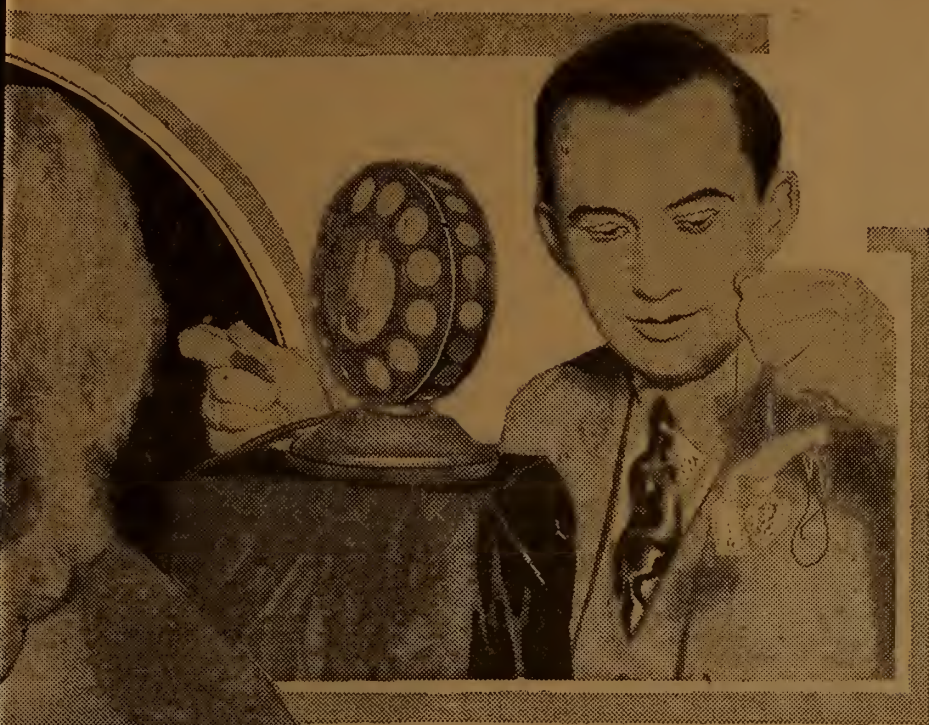
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JUNE 24 ON CHAIN OF STATIONS



Paul Specht will present Harold Oxley's Post Lodge orchestra at WJZ Saturday, June 21. Here Mr. Specht is shown with his "insect jazz" orchestra. Two beetles and a cricket are in the paper bags.

lectures, "Agriculture, the Civilizer of the World," L. W. Falgren; address, James Manahan; 8-9:30, Fred Albrecht's band, St. Paul, Minn.

WLS, Chicago, Ill. (Central, Daylight, 345), 1-2 p. m., Four Georges Sears-Roebuck; 3:45-4:45, Phyllis Campbell, contralto; "The One Woman Household," Mrs. Nema W. Badenoch; Jarvis trio; "Simple Facts about the Growing Boy," member of Illinois Medical society; 6:30-11, Frank Westphal orchestra; lullaby time, Glenn Rowell, Ford Rush; farm program, talka, Verna Elsing, John Turnipseed; "Soybeans as a Commercial Crop," L. C. Bradley, Illinois College of Music.

WMAQ, Chicago, Ill. (Central, Daylight, 447.5), 2:35 p. m., Lyon and Healy; 4:15, Mrs. Frances M. Ford; 4:30, pupils, Bush conservatory; 6, Chicago theater organ; 6:30, Hotel LaSalle orchestra; 8, wide-awake program and nature study club; 8:30, topics, C. E. McBurney; 8:40, French lessons, Morin De Cologny; 9, weekly lecture from the Field Museum; 9:15, program, A. Candorin, director; 8:30, Harriet G. Ridley, pianist; 9:30, Mrs. E. Vogt, organist; 10, Hotel Adelphia dance orchestra.

WQJ, Kansas City, Mo. (Central, 360), 7:30-8 p. m., program of technical radio discussions for the Radio Club of Greater Kansas City; music, Wurlitzer reproducing piano; vocal solo.

WOR, Newark, N. J. (Eastern, Daylight, 405), 7-7:30 a. m., WOR gym class; 2:30-2:45 p. m., Florence Steele, contralto; 2:45-3:15, Manhattan serenades; 3:30-3:45, Mrs. J. M. Beech, mono-actress, Katherine Brun Martin, pianist; 3:45-4, Florence Steele, contralto; 6:15-6:30, songs for children, Agnes Leonard; 6:30-7, "Man in the Moon," stories for children; 7-7:20, "Music While You Dine," The Dixie Minstrel Troupe; Gus Pinard, director; 7:20-7:30, resume of day's sports, Newark Morning Ledger.

WOS, Jefferson City, Mo. (Central, 440.9), 7:45 p. m., "Hydrophobia, or Rabies as a Menace to Animals and Folks," Dr. Homer A. Wilson; 8, address, George A. Pickens; 8:20, musical program, Hermann, Missouri juvenile orchestra.

WPAL, Cotabus, Ohio (Eastern, 286), 6 p. m., Athletic Club orchestra; lecture.

WRC, Washington, D. C. (Eastern, 469), 3 p. m., fashion developments of the moment, women's wear; 3:10, Arthur McCormick, baritone; 3:20, "Beauty and Personality," Elsie Pierce; 3:25, current topics, editor of The Review of Reviews; 3:35, Ethel Grant, pianist; 4, songs; 6, stories and songs for children, Peggy Albion, Mary Frances Glenn.

WTAS, Elgin, Ill. (Central, 286), 7:30-12 midnight., WTAS orchestra; Lee Sims, pianist.

WWJ, Detroit, Mich. (Eastern, 517), 8 a. m., setting-up exercises, R. J. Horton; 12 m., Detroit News orchestra; 3 p. m., Schmemman's band; 8:30, Schmemman's band; 9:30, Detroit News orchestra.

Saturday, June 21

Silent night for: CKAC, KFNF, KFAE, KFOA, KFSG, KGV, WAAW, WBAP, WBAW, WDAW, WEAD, WGR, WLW, WOO, WOS, WWJ.

CKAC, Montreal, Can. (Eastern, Daylight, 425), 7 p. m., kiddies' stories in French and English, The Book of Knowledge; 7:30, classic music, Rex Battle and his Mount Royal Hotel orchestra; Benjamin Scherzer, violinist; Herbert Spencer, organist; 8:30, La Presse Studio entertainment; 10:30, Mount Royal Hotel Roof Garden Dance orchestra.

KFAF, Denver, Colo. (Mountain, 360), 8-9 p. m., KFAF Gloom Busters.

KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m., vocal concert; 8-9, concert, Ruth Shaffner; 9-10, Ex-aminer concert; 10-11, concert, popular songs; 11-12, Ambassador-Max Fischer's Cocoanut Grove orchestra.

KFNF, Shenandoah, Iowa (Central, 266), 7:30 p. m., concert, artists from Coburg.

KFSG, Los Angeles, Calif. (Pacific, 278), 3:30-5:30 p. m., concert, Gray studio, courtesy, Mrs. Elizabeth Hughes; organ recital, Roy Reid Brignall; 6:30-7:30, "Kozy Hours," Junior Crusaders; Pre-view I. S. S. lesson by Mother; Snowgum Sisters, Golden trio.

KGO, Oakland, Calif. (Pacific, 312), 4-5:30 p. m., concert orchestra, Hotel St. Francis; 8, part one: faculty of Arrillaga Musical college; Raymond White, pianist; Frances D. Woodbridge, soprano; George Edwards, pianist; Myrnard S. Jones, bass; Guy E. Kibbee, reader; part two: Musical Art Society Male quartet, Vern Kelsey, pianist; 10-1, Hotel St. Francis Dance orchestra, Henry Halstead, leader.

Where to Hear Talks

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

- Wednesday:** KDKA, KFAE, KFOA, KGO, KGW, KHJ, KPO, KQV, KYW, WBAH, WBBR, WCAP, WCX, WDAF, WDAW, WEAF, WEOA, WGI, WHA, WHAS, WJZ, WLAG, WLS, WLW, WMAQ, WPAL, WOR, WOS, WRC.
- Thursday:** CKAC, KDKA, KGO, KYW, WAAW, WBBR, WCAE, WDAF, WEOA, WGY, WHAS, WHB, WIP, WJAX, WJZ, WLAG, WLS, WMAQ, WOC, WOR, WRC.
- Friday:** KDKA, KFOA, KGW, KHJ, KYW, WAAW, WBAW, WCAP, WDAF, WEAF, WEOA, WGI, WGY,
- WHA, WHB, WJZ, WLAG, WLS, WLW, WMAQ, WOS, WPAL.**
- Saturday:** KDKA, KYW, WBAH, WBAP, WBBR, WDAF, WFI, WGI, WHAA, WJZ, WLAG, WLS, WOAW, WRC.
- Monday:** KGO, WBZ, WDAW, WEAF, WGR, WGY, WLAG, WLW, WOC, WOS.
- Tuesday:** KFAE, KFSG, KGW, KYW, WAAW, WCAE, WDAF, WDAW, WEAF, WGI, WGY, WHAS, WJY, WJZ, WLAG, WLS, WMAQ, WOC, WOR, WRC, WSB.

ular songs; 9-10, Shrine band.

WFAA, Dallas, Texas (Central, 476), 12:30-1 p. m., address, Dr. Robert S. Hyer; 8:30-9:30, old-time music box selections, George A. Nicoud; zither music, Dallas expert.

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

WGI, Medford Hillside, Mass. (Eastern, Daylight, 360), 7 p. m., meeting of the Amrad Big Brother club; 7:30, selected verses, Charles L. H. Wagner, Radio poet; 7:40, late Ampico releases; 8, musicale.

WGR, Buffalo, N. Y. (Eastern, Daylight, 319), 12:30-1 p. m., George Albert Bouchard, organist; 6:30-7:30, dinner music; 8:30-10:30, concert, Heirloom Plate band, direction, S. G. Blakelock for William A. Rogers company; 10:30-11, concert, Semper Fidelis orchestra, direction of Rudolph Pinkel; 11:30-1:30, supper dance music, Vincent Lopez Hotel Statler orchestra, Harold Gesler, director.

WGY, Schenectady, N. Y. (Eastern, 380), 1 p. m., "The Decorative Value of Pictures," Robert L. Smith; 5:30, stories for children; 5:45, children's story in French, Frederic Duclert; 7:45, Mediterranean travelogue, James A. Leary; WGY orchestra; T. Reed Vreeland, tenor; 10:30, Paramount concert orchestra; Leo Pearlman, director.

WHA, Madison, Wis. (Central, 360), alumni reminiscences.

WHAS, Louisville, Ky. (Central, 400), 4-5 p. m., Alamo Theater orchestra; "Just Among Home Folks," The Courier-Journal; Walnut Theater orchestra; 7:30-9, concert, auspices National Music studios, George A. Engel, director.

WHB, Kansas City, Mo. (Central, 411), 2-3 p. m., ladies' hour program, Sweeney Radio orchestra, direction of George Parrish; 7-8, dance music, Sweeney Radio orchestra.

WHK, Cleveland, Ohio (Eastern, 390), 9 p. m., concert program, arranged by Wm. Taylor Son & Co.; Louis Rich and his orchestra; solos, popular artists.

WHN, New York, N. Y. (Eastern, Daylight, 360), 2:15-2:45 p. m., Snappy quartette; 3-3:45 Loew's Astoria theater; 3:45-4:15, Original Indiana five; 4:30-4:45, Frank Wright and Frank Bessinger; 4:45-5:15, Jay Ryan and His Glenwood Terrace orchestra; 5:30-5:45, Victor Wilbur, baritone; 6-7, at the festive board, 9-9:45, Astoria theater; 9:45-10:15, Hotel Carlton terrace orchestra; 10:15-10:30, Harry Hook entertainers; 10:30-11, Roseland Dance orchestra; 11-11:30, Ted Barron's surprise; 11:30-12, S. S. City of Seattle, Atlantic City Line orchestra.

WIP, Philadelphia, Pa. (Eastern, Daylight, 509), 10 a. m., Atlantic City Seashore gossip; 3 p. m., "What the wild waves are saying"; 3:30, Comfort's Philharmonic orchestra; Charles Cinti, piccolo soloist, Veronica Schweigart, mezzo soprano; 6:05, Jordan-Lewis dance orchestra; 7, Uncle Wip's bedtime stories.

WIY, New York, N. Y. (Eastern, Daylight, 405), "Sport," 8:30 p. m., overture, 8:35, prologue, 8:40, episode 1, Jazz, xylophone, Hennessee orchestra, 9, episode 2, a Sing Song, the Dixie Stars (Bernard and Robinson), 9:30, episode 3, Three Nibs Up, Audrea Feyre, 9:45, episode 4, popular melodies, Koty and Abram, 10:15, episode 5, J. Andrew White, 10:30, episode 6, Jazz.

WJZ, New York, N. Y. (Eastern, Daylight, 455), 1-1:15 p. m., Hotel Ambassador trio; 3-4, Hotel Astor organ recital; 4-4:10, Eleanor Gunn's fashion talk; 4:10-4:20, arts and decorations; 4:20-4:30, "Peeps at People," Eudythe H. Browne; 4:30-4:45, "Kandy Kiddies," Sarita MacLeary; 4:45-5:15, "Fashions of the Stage," Cora Moore; 5:15-5:30, Fred Gerrold, baritone; 8-8:15, "The Economic Value of Insects," Dr. Frank C. Lutz; 8:15-10, Goldman band concert, Edwin Franko Goldman, conductor; 10-10:45, peopies chorus, 10:45-11, Paul Specht's alamac orchestra.

WKAQ, San Juan, P. R. (Central, 360), 6-8 p. m., studio program.

WLAQ, Minneapolis-St. Paul, Minn. (Central, 417), 10:45-11:15 a. m., household hints; 11:35-12 m., surge hour; 2:10-2:40 p. m., woman's club hour, "Surprise and Screen Review," Lester Rees; "Fresh Air Camps as Character Builders," Belle Mead; 2:40-4, Charles Cordray's Slowpoke orchestra; 4-4:30, magazine reading; 5:30-6, children's hour; meetings, Radio Health and Toothbrush Club of America; Dr. F. W. Pepper, president; 6-6:15, sport hour, "Canoeing West End of Hunter's Island," Mel Nyman; 7:30-8:15, farm

KGW, Portland, Ore. (Pacific, 423), 3 p. m., children's program: Katherine Doran, pianist; story, Aunt Nell; 10, George Olsen's Metropolitan orchestra; 12:30-1:15 p. m., concert, 2:30-3:30, matinee musicale; 6-6:30, Art Hickman's concert orchestra; 6:45-7:30, children's program, Prof. Walter Sylvester Hertzog; Helen Pirte, screen juvenile; Margaret Johnson, violinist; Thornton Ward, reader, age, 7 years; Bedtime story, "Uncle John"; 8-10, Santa Ana program, Olliman Matthew, violinist; Mme. Manuela Gunders, soprano; Caesar Clonfoni, trombonist; Earl Frazer, pianist; Edward Burns, cellist; 10-11, Art Hickman's dance orchestra.

KPO, San Francisco, Calif. (Pacific, 423 1-2 p. m., Rudy Selger's Fairmont Hotel orchestra; 2:30-3:30, musical matinee; 3:30-5:30, tea dance, E. Max Bradford's versatile band; 8-12, Art Weidner and his artists; David Zimet.

KSD, St. Louis, Mo. (Central, 546), 8 p. m., Missouri Theatre and specialties.

KYW, Chicago, Ill. (Central, Daylight, 536), 11:35 a. m., table talk, Mrs. A. J. Peterson; 7-7:30 p. m., dinner concert, Congress hotel; 8-8:58, Jessie Mandoville, soprano; Henriette Nolan, violinist; Luther Carter, tenor; Eather Thomas, accompanist; E. H. Brunn, accompanist; Prof. John Wheeler, artist; 9, talk, Vivette Gorman; 8:05, Youth's Companion; 9:15-12:30, late show.

PWX, Havana, Cuba (Eastern, 400), 8:30 p. m., artists from personnel of the Cuban Telephone company; Adeline Ares, pianist; songs, Virginia Gonzalez; Maria Antonia Calines, reader; Power, mandolinist; songs, Miss A. Biant; Elana Hill, mandolinist.

WBA, Miami, Fla. (Central, 417), 12:30-1:30 p. m., children's vaudeville; 7-7:30 p. m., Council of churches.

WBAP, Fort Worth, Texas (Central, 476), 7-7:40 p. m., Sunday school lesson and Radio Bible class, Mrs. W. F. Barnum.

WBAY, Columbus, Ohio (Eastern, 390), 12 m., Ila Orscho, Owens, pianist.

WBB, New York, N. Y. (Eastern, Daylight, 273), 8 p. m., Mrs. B. F. Brown, Jr., mezzo-soprano; 8:15, Ruth De Boer, soprano; 8:30, Bible questions and answers.

WBZ, Springfield, Mass. (Eastern, Daylight, 337), 6 p. m., dinner concert, Leo Reisman, ensemble; 6:30, dinner, dance music, Leo Reisman and his orchestra; 7-7:10, Leo Reisman, ensemble; 7:30, bedtime story for the kiddies; 7:40, Hotel Kimball trio, Jan Geerts, violinist; Angela G. Lonergan, cellist; Paul Lawrence, pianist; 9, concert, Mrs. George Y. Kella, director.

WCAE, Pittsburgh, Pa. (Eastern, Daylight, 462), 3 p. m., Billy Zorfer's Music Box Cafe orchestra; 6:30, dinner, dance music, William Hottel, 7:30, Uncle Kaybee; 7:45, vocal selections, Lew Kennedy, baritone; Irene Seitzler, pianist; 8:30, Nerin trio; Dr. John M. Herholzer, flutist; Eleanor Conley, soprano; Marie Caveney, pianist.

WCX, Detroit, Mich. (Eastern, 517), 4:15 p. m., music; 6, dinner concert; 7, Eastern Star Cafe orchestra.

WDAF, Kansas City, Mo. (Central, 411), 3:30-4:30 p. m., the Star's Radio trio; 6-7 p. m., school of the air, piano tuning-in number, the Duo-Art; address, Edgar A. Linton, writer-lecturer of K. C., the Tell-Me-a-story club; music, the Hotel Muehlbach orchestra; 11:45-1 a. m., nighthawk frolic, the Plantation players.

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

WEAF, New York, N. Y. (Eastern, Daylight, 492), 4:45 p. m., Greenville Village Inn orchestra; 5-5:15, piano recital, baritone; 5:15-5:30, Ella Mylius, soprano; 6-7, dinner music, Hotel Waldorf-Astoria; 7-7:15, Wm. Owen Gilboy, tenor; 7:30-7:45, Zec Confrey, pianist; 7:45-8:15, bedtime story, G. R. Kinney Shoe company; 8:15-9:15, joint program, Adelaide de Loza, contralto; Gladys Durham, soprano; Leslie Almeda, baritone; Elsie T. Cowen, accompanist; 9:45, 10, Victor Bay, violinist; Amantia Bay, pianist; 11-12, Vincent Lopez and his orchestra.

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

WEAY, Houston, Texas (Central, 360), 12-1 p. m., Rice Hotel orchestra; 6-7, Rice Hotel orchestra; 8:30-10, dance program, McMillan's dance hall.

WFAA, Dallas, Texas (Central, 475), 12:30-1 p. m., "Children's Camp," Frank E. Moran; 8:30-9:30, music, Mrs. Y. O. Rosser and assisting musicians; 11-12, Adolphus Hotel orchestra.

WFI, Philadelphia, Pa. (Eastern, Daylight, 395), 1 p. m., Meyer Davis Bellevue Stratford concert orchestra; 6, Sunny Jim, the kiddie's pal; 6:30, Meyer Davis Bellevue Stratford concert orchestra; 8:15, Charlie Kerr and his symphonic dance orchestra.

WGI, Medford Hillside, Mass. (Eastern, Daylight, 360), 7 p. m., Amrad Big Brother club; 7:30, talk on current events, David M. Cheney; musicale.

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

WGY, Schenectady, N. Y. (Eastern, 380), 3:30 p. m., dance music, orchestra of Hotel Ten Eyck.

WHA, Madison, Wis. (Central, 360), 6-9 p. m., alumni banquet.

WHB, Kansas City, Mo. (Central, 411), 2-3 p. m., ladies' hour program, Sweeney Radio orchestra, direction of George Parrish.

WHN, New York, N. Y. (Eastern, Daylight, 360), 12-1 p. m., Radio Shack orchestra; 2:15-2:45, Brian & Tobias, songwriters; 2:30-3, Tom Banks orchestra; 3-3:45, Loew's Astoria theater; 3:45-4:15, Disabled American Veteran orchestra, Anthony Toschis, leader; 4:30-4:45, Carrie Cohen, pianist; 4:45-5, Natalie Shotland, singer; 5-5:30, at King's Original Louisiana land, singing; at the festive board; 7:30-8, Bway Jones and his Royal Poncianna orchestra; 8-8:15, W. H. Carlion of the Terminal Barber shops; 8:15-8:30, Solly Newman, pianist; 8:30-8:45, Henriette Grennan, soprano; 8:45-9, Eileen Montague Cross presenting Eugene Willis Bradley and quartette; 9-9:45, Astoria theater broadcasting; 10-10:30, Original Firestone quartette; 10:45-11, Fitzpatrick brothers; 11-11:15, Joe B. Polinor; 11:30-11:45, Mardla Dantzer, soprano.

WHAS, Louisville, Ky. (Central, 400), 4-5 p. m., Walnut Theater orchestra; "Just Among Home Folks," The Courier-Journal; Alamo Theater orchestra; 7:30-9, concert, Mrs. J. A. Nicklies, director; Wayne R. Euehner's orchestra.

WIP, Philadelphia, Pa. (Eastern, Daylight, 509), 10 a. m., Atlantic City seashore gossip; 1 p. m., Karl Bonawitz, organist; 3, "What the wild waves are saying"; 3:30, Comfort's Philharmonic orchestra; 6:05, William Smith dance orchestra; 7, Uncle Wip's bedtime stories; 8, Comfort's Philharmonic orchestra; 8:45, Vessella's concert band, Margaret Keever, con-

tralto; 10:15, Bob Lehman's dance orchestra, Steel Pier, Atlantic City.

WJZ, New York, N. Y. (Eastern, Daylight, 455), 3-1-3:30, "Photoplay Writing," Roy C. Jones; 4-4, Paul Specht presents Harold Oxley's Post Lodge orchestra; 5-5:15, Frank Wright and Frank Bessinger, 7-8, Greenwich Village Inn orchestra, H. W. W. director; 8-8:15, Lenore Manserle, soprano; 8:15-8:45, The Outlook Period; 8:30-8:45, Le re Maserle soprano; 8:45-9, "Quieting the Recluser Neighbor," Dr. Alfred N. Goldmith of Italo Corp. of America; 9-10, program, the New York Times, 10-10:15, Washington Lee, pianist; 10:30-11, Club Lido, Venice orchestra.

WLAG, Minneapolis-St. Paul, Minn. (Central, 417), 11:35-12 m., post card club; 7:30-8:15, bible messages; 8-9:30, Municipal Band concert from Lake Harriet, Minneapolis; 10:30-12, o. dance program.

WLS, Chicago, Ill. (Central, Daylight, 345), national farm barn dance.

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

WOO, Philadelphia, Pa. (Eastern, Daylight, 509), 11 a. m., Mary E. Vogt, organist; 12:02, p. m., Wanaaker Crystal Tea room orchestra; 4:45, Mary E. Vogt, organist; J. W. C. L. band.

WVC, Memphis, Tenn. (Central, 500), 8:30 p. m., program, Mrs. Arthur Bower and company.

WOAW, Omaha, Neb. (Central, 526), 6-7:30 p. m., dinner program; 9-11, program, vocal studies, Fred G. Eilia, baritone.

WOC, Davenport, Iowa (Central, 484), 12 m., chimes; 5-5:45, chimes; 6:30, sandman's visit; 9, The Parker School Radio orchestra; Ralph W. Fuller, baritone.

WQQ, Kansas City, Mo. (Central, 360), 7-7:30 p. m., International Sunday school lesson, Dr. W. E. L. Wilson; 8-9:30, music, Western Radio orchestra; 11-11:30, religious service, the Unity School of Christianity.

WOR, Newark, N. J. (Eastern, Daylight, 405), 7:30 a. m., Wolt gym class; 2:30-3 p. m., Kola's Philadelphia symphony orchestra; 3-3:30, concert, Orchestra of the S. S. Harding; 3:30-4, Kola's Pleetruan orchestra; 6:15-7:30, "Music While You Dine," Duke Ericketti's Cinderella orchestra; 8-8:55, Gene L. Linton and his Bell Record orchestra; 8:55-9:15, radio studios of Mme. Jessie Fenner Hill; 9:15-9:45, "High Hours with Men of Achievement," George Gray Bernard, sculptor; 9:45-10, Mme. Jessie Fenner Hill's studios; 10:10-11, Ernie Young's Revue, now at Dreamland Park, Newark, N. J.

WPA, Columbus, Ohio (Eastern, 286), 10 p. m., Athletic Club orchestra, dance program.

WRC, Washington, D. C. (Eastern, Daylight, 425), 6 p. m., children's hour, Peggy Albion; 7:45, Bible talk, Men's Organized Bible class association; 8, 9, 8:30, talk on the Coast Guard, Oliver M. Moore; 9, Helen Harper, soprano; 10, Harmonious quartet.

WTAM, Cleveland, Ohio (Eastern, 390), 9 p. m., WTAM Dance orchestra; Amphion Male quartet.

WTAS, Elgin, Ill. (Central, 286), 7:30-12 midnight., WTAS orchestra; Lee Sims, pianist.

WWJ, Detroit, Mich. (Eastern, 517), 8 a. m., setting-up exercises, R. J. Horton; 12 m., Detroit News orchestra; 3 p. m., Schmemman's band; 7:30, Schmemman's band.

Sunday, June 22

Silent night for: CKAC, KFAE, KFAF, KFOA, KGO, KSD, WAAW, WBAH, WDAF, WDAW, WGR, WHN, WIP, WOO.

CHYC, Montreal, Can. (Eastern, Daylight, 341), 7 p. m., American Presbyterian church.

CKAC, Montreal, Can. (Eastern, Daylight, 425), 6:45 p. m., sacred concert.

CKCK, Regina, Can. (Mountain, 420), 8 p. m., Rev. J. H. Wells, Church of Christ.

KFI, Los Angeles, Calif. (Pacific, 469), 10:10-10:45 a. m., L. A. Church Federation service; 4-5 p. m., radio concert; 8:15-7:30, concert; 8-9, Ambassador hotel concert; 9-10, Examiner concert; 10-11, Schmemman's concert.

KFNF, Shenandoah, Iowa (Central, 266), 3 p. m., services, L. J. Schnabel, director; 6:30, sacred music service.

KFSG, Los Angeles, Calif. (Pacific, 278), 11-11:30 p. m., Angeles Temple service, script, Alice Semple McPherson; organ; chimes; 10-12, music, Glenn Semple, children's choir and service; 2:0-4:30 p. m., Angeles Temple service, silver band; ch. fr. address, Alice Semple McPherson; 8-10, Congregational greeting to song to world; salvation sermon and altar call, Alice Semple McPherson.

KGO, Oakland, Calif. (Pacific, 312), 3:30 p. m., KGO Little Symphony orchestra, Carl R. Liska, conductor.

KGW, Portland, Ore. (Pacific, 492), 6 p. m., church services, Rose City Park Presbyterian church, Rev. Donald MacLeure, pastor; 7, George Olsen's concert orchestra.

KHJ, Los Angeles, Calif. (Pacific, 395), 10 a. m., sermon from the studio; 10-12, music, Glenn Semple recital and service from First M. E. church; 4:30-5:30, Art Hickman's concert orchestra; 7-7:40, organ recital from First M. E. church, Arthur Blakeley, organist; 8-10, De Luxe concert.

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

WBAP, Fort Worth, Texas (Central, 476), 11-12:15 p. m., First Presbyterian church, Rev. J. K. T. pastor; 4-5, Marguerite A. White, organist; 11-12, popular program, Fred Caboon's orchestra.

WCX, Detroit, Mich. (Eastern, 517), 2 p. m., Radio chapel services, Detroit Free Press studio; 7-7:45, service, Central M. E. church, Rev. Lynn Harold Bush, pastor; Hudson quartet.

WDAF, Kansas City, Mo. (Central, 411), 3-4 p. m., classical program, Star Radio orchestra.

WEAF, New York, N. Y. (Eastern, Daylight, 492), 3-4 p. m., hymn singing, Greater New York Federation of churches; 4-5, services, Greater New York Federation of churches; 7:30-9:15, Capitol theater; 9:15-10:15, organ recital, Skinner organ company.

WEAY, Houston, Texas (Central, 360), 11 a. m., 8 p. m., church services, First Baptist church; 9:30-10, Iris theater organ concert.

WFAA, Dallas, Texas (Central, 476), 9-10 a. m., sacred song recital, Double Male quartet, Grace Methodist Episcopal church, Earle D. Behrends, director; 10-11, orchestra, Grace Methodist Episcopal church.

(Continued on page 14)

roadcast

- WLS,
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dance orchestra; 7, Uncle Wip's bedtime stories
WJY, New York, N. Y. (Eastern, Daylight, 405),
 "Sport," 8:30 p. m., overture, 8:35, prologue, 8:40,
 episode 1, Jazz, Xylophone, Hennessey orchestra, 9,
 episode 2, a Sing Song, the Dixie Stars (Bernard and
 Robinson), 9:30, episode 3, Three Nibs Up, Audrea
 Peyree, 9:45, episode 4, popular melodies, Koty and
 Abram, 10:15, episode 5 J. Andrew White, 10:30,
 episode 6, Jazz.
WJZ, New York, N. Y. (Eastern, Daylight, 455): 1-
 1:15 p. m., Hotel Ambassador trio; 3-4, Hotel Astor
 organ recital; 4-4:10, Eleanor Gunn's fashion talk;
 4:10-4:20, arts and decorations; 4:20-4:30, "Peeps at
 People," Edythe H. Browne; 4:30-4:45, "Kandy Kid-
 dies," Sarita MacLeary; 4:45-5:15, "Fashions of the
 Stage," Cora Moore; 5:15-5:30, Fred Gerrold, barito-
 ne; 8-8:15, "The Economic Value of Insects," Dr.
 Frank C. Lutz; 8:15-10, Goldman band concert, Edwin
 Franko Goldman, conductor; 10-10:45, peoples chorus,
 10:45-11, Paul Specht's alamac orchestra.
WKAQ, San Juan, P. R. (Central, 360), 6-8 p. m.,
 studio program.
WLAG, Minneapolis-St. Paul, Minn. (Central, 417),
 10:45-11:15 a. m., household hints; 11:35-12 m., sur-
 prise hour; 2:10-2:40 p. m., woman's club hour, "Stage
 and Screen Review," Lester Rees; "Fresh Air Camps
 as Character Builders," Belle Mead; 2:40-4, Charles
 Cordray's Slowpoko orchestra; 4-4:30, magazine read-
 ing; 5:30-6, children's hour; meeting Radio Health
 and Toothbrush Club of America; Dr. F. W. Pepper,
 president; 6-6:15, sport hour, "Canoeing West End
 of Hunter's Island," Mel Nyman; 7:30-8:15, farm

Silent night for: CKAC, KFNF, KFAE, KFOA, KFSG,
 KQV, WAAW, WBAP, WBAV, WDAR, WEAD,
 WGR, WLW, WOO, WOS, WWJ.
CKAC, Montreal, Can. (Eastern, Daylight, 425), 7
 p. m., kiddies' stories in French and English, The
 Book of Knowledge; 7:30, classic music, Rex Battle
 and his Mount Royal Hotel orchestra; Benjamin Scher-
 zer, violinist; Herbert Spencer, organist; 8:30, La
 Presse Studio entertainment; 10:30, Mount Royal Hotel
 Roof Garden Dance orchestra.
KFAF, Denver, Colo. (Mountain, 360), 8-9 p. m., KFAF
 Gloom Busters.
KFI, Los Angeles, Calif. (Pacific, 469), 6:45-7:30 p. m.,
 vocal concert; 8-9, concert, Ruth Shaffner; 9-10, Ex-
 aminer concert; 10-11, concert, popular songs; 11-12,
 Ambassador-Max Fischer's Coconut Grove orchestra.
KFNF, Shenandoah, Iowa (Central, 266), 7:30 p. m.,
 concert, artists from Coburg.
KFSG, Los Angeles, Calif. (Pacific, 278), 3:30-5:30 p.
 m., concert, Gray studio, courtesy, Mrs. Elizabeth
 Hughes; organ recital, Roy Reid Brignall; 6:30-7:30,
 "Kozy Hours," Junior Crusaders; Pre-view I. S. S.
 lesson by Mother; Snowgrim Sisters, Golden trio.
KGO, Oakland, Calif. (Pacific, 312), 4-5:30 p. m., con-
 cert orchestra, Hotel St. Francis; 8, part one: faculty
 of Arrillaga Musical college: Raymond White, pianist;
 Frances D. Woodbridge, soprano; George Edwards,
 pianist; Mynard S. Jones, bass; Guy B. Kibbee, reader;
 part two: Musical Art Society Male quartet, Vern Kel-
 sey, pianist; 10-11, Hotel St. Francis Dance orchestra,
 Henry Halstead, leader.

ladies' hour program, Sweeney Radio orchestra, direc-
 tion of George Parrish.
WHN, New York, N. Y. (Eastern, Daylight, 360), 12-1
 p. m., Radio Shack orchestra; 2:15-2:45, Breen &
 Tobias, songwriters; 2:30-3, Tom Banks orchestra; 3-
 3:45, Loew's Astoria theater; 3:45-4:15, Disabled
 American Veteran orchestra, Anthony Toschis, leader;
 4:30-4:45, Carrie Cohen, pianist; 4:45-5, Natalie Shot-
 land, singing; 5-5:30, Al King's Original Louisiana
 Five; 6-7, at the festive board; 7:30-8, Bway
 Jones and his Royal Poncianna orchestra; 8-8:15, W.
 H. Carlomag of the Terminal Barber shops; 8:15-8:30,
 Solly Newman, pianist; 8:30-8:45, Henriette Grennan,
 soprano; 8:45-9, Ellen Montague Cross presenting
 Eugene Willis Bradley and quartette; 9-9:45, Astoria
 theater broadcasting; 10-10:30, Original Firemen's
 quartette; 10:45-11, Fitzpatrick brothers; 11-11:15,
 Jos. B. Pabner; 11:30-11:45, Mardia Dantzer,
 soprano.
WHAS, Louisville, Ky. (Central, 400), 4-5 p. m.,
 Walnut Theater orchestra; "Just Among Home Folks,"
 The Courier-Journal; Alamo Theater orchestra; 7:30-9,
 concert, Mrs. J. A. Nicklics, director; Wayne R.
 Euchner's orchestra.
WIP, Philadelphia, Pa. (Eastern, Daylight, 509), 10 a.
 m., Atlantic City seashore gossip; 1 p. m., Karl
 Bonawitz, organist; 3, "What the wild waves are
 saying," 3:30, Comfort's Philharmonic orchestra; 6:05,
 William Smith dance orchestra; 7, Uncle Wip's bed-
 time stories; 8, Comfort's Philharmonic orchestra;
 8:45, Vessella's concert band, Margaret Keever, con-

rectal and service from First M. E. church, Arthur
 Blakeley, organist; Rev. I. E. He... pastor;
 Art Hickman's concert orchestra; 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.,
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WBAP, Fort Worth, Texas (Central, 476), 11-12:15 p.
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WCX, Detroit, Mich. (Eastern, 517), 2 p. m., Radio
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WDAF, Kansas City, Mo. (Central, 411), 3-4 p. m.,
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 Federation of churches; 7:20-9:15, Capitol theater; 9:15-
 10:15, organ recital, Skinner organ company.
WEAY, Houston, Texas (Central, 360), 11 a. m., 8 p. m.,
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 theater organ concert.
WFAA, Dallas, Texas (Central, 476), 9-10 a. m., sac-
 red song recital, Double Male quartet, Grace Metho-
 dist Episcopal church, Earle D. Behrends, director;
 10-11, orchestra, Grace Methodist Episcopal church.
 (Continued on page 14)

Sunday, June 22

(Continued from page 13)
WFI Philadelphia, Pa. (Eastern, Daylight, 395), 4:30 p. m., services, F. A. S. Dull.
WGI Bedford Hills, Mass. (Eastern, Daylight, 360), 4:30 p. m., Adventist hour, Youth's work, auspices Greater Boston Conference.

Monday, June 23

Silent night for: KGW, WBBR, WDAR, WGR, WOC, WOO, WOR, WOS.
CKAC, Montreal, Can. (Eastern, Daylight, 425), 1:45 p. m., Mount Royal Hotel orchestra; 4:30, tea dance, Mount Royal Hotel orchestra.

Loretta Kerk, pianist; 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; 6:30-7:30, dinner music; 9:10-10:30, musical program, Catholic Union and Times; 10:30-11:00, concert, the Ganzler Buffaloan orchestra; 11:30-1:30, supper-dance music, Vincent Lopez Hotel Statler orchestra, Harold Gleser, directing.

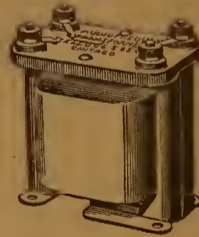
Tuesday, June 24

Silent night for: CKAC, KFNF, KFOA, KFSG, KYW, WEAO, WFI, WHAS, WIP, WLS, WMAQ, WRC, WSAI.
CKAC, Montreal, Can. (Eastern, Daylight, 425), 7 p. m., Kiddies' stories in French and English; 7:30, Mount Royal Hotel orchestra; Nap Dansereau, cellist; 8:30, entertainment, orchestra of S. S. Canada; 10:30, Mount Royal Hotel Roof Garden dance program, Joseph C. Smith and his orchestra.

Daphne Goss; Dorris Jones, piano recital; Inex Lasley, soprano; Bible story, Mother Kennedy; 8-9:30, Angelus Temple revival service, address; music; sermon; 9:30-10:30, "Plantation Melodies," Swannee Jubilee; 10:30, organ recital, Roy Reidd Drignall; Aimee Semple McPherson.
KGO, Oakland, Calif. (Pacific, 312), 4-5:30 p. m., concert orchestra, Hotel St. Francis; 8, part one: California Mixed quartet; Josephine Holub, violinist; Edilberto G. Anderson, baritone; Clau Macdonald Double Male quartet; Ruth Waterman, contralto; Carl Andrea son, tenor; Beatrice L. Sherwood, pianist; Laura Broderick, soprano; part two: "In a Persian Khayyam," Otto Riehl.
KGW, Portland, Ore. (Pacific, 492), 3:30 p. m., children's program; 8, concert, Sieberling-Lucas music company.

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a. m., Atlantic City seashore gossip; 1 p. m., Karl Bonawitz, organist; 3, "What the wild waves are saying," 8:05, "Obesity Diet," Mrs. Anna B. Scott; 3:30, Comfort's Philharmonic orchestra; 6:05, WIP, little symphony orchestra; 7, Uncle Wip's bedtime stories; 8, Comfort's Philharmonic orchestra; 8:45, Murphy's Minstrels, Steel Pier, Atlantic City; 10:15, LeRoyale dance orchestra.
WJAX, Cleveland, Ohio (Eastern, 390), Cleveland News-Leader program; 7:30 p. m., bedtime story, E. G. Johnson; Radio cartoon, Don Palmer; special numbers.
WLAG, Minneapolis-St. Paul, Minn. (Central, 417), 10:45-11:12 a. m., household hints; 11:35-12 m., surprise hour; 2:10-2:40, woman's club hour; 2:40-1, daylight concert; 4-4:30, WLAG players; 5:30-6 p. m., children's hour; 6-6:15, sport hour; 6:15-7, dinner hour concert; 7:30-8:15, farm lectures.



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USE-IS THE TEST

30 Minute A-B-C Lessons for Radio Beginners

Chapter XIV—What Tuning In Is; How to Do It

By P. E. Edelman

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

Chapter XV—Working Through Interference.
 Chapter XVI—The Power Voice of Radio.
 Chapter XVII—Reproducers, The Finishing Touch of Radio.
 Chapter XVIII—The Hero Circuits of Radio.
 Chapter XIX—What is Doing in Complicated Circuits.

TUNING, while at first difficult to comprehend, is a simple principle. Two different sending stations can each send splashes through the ether to

piano string must be in tune for the frequency picked up.

Mandolin Illustrates Radio Tuning

In a mandolin, eight strings are arranged in four pairs. Each pair of wires is tuned to the same note. If one of the wires of a pair is picked, no vibration occurs in any of the wires except the one picked and the other wire of the same pair. Although not touched, the second wire will vibrate as vigorously as the first. If the first wire is stopped with a finger, the second wire will continue to vibrate. The second wire is in tune with the first and coupled to it. The first string corresponds to a sending station and the second wire of the same pair represents a receiving station. The other strings may be thought of as other receiving stations tuned to different frequencies.

The first wire plucked pushes air during each swing to and fro. The pushed air falls on the other wires in the mandolin but the only one it reaches in correct

is stretched between two chair supports about 12 feet apart. Three different length strings are tied at one end and weighted to act like pendulums. At the

mination of electrical tuning is completed in electrical capacity (condensers), and electrical inductance (coils). To increase the frequency of an electrical circuit,

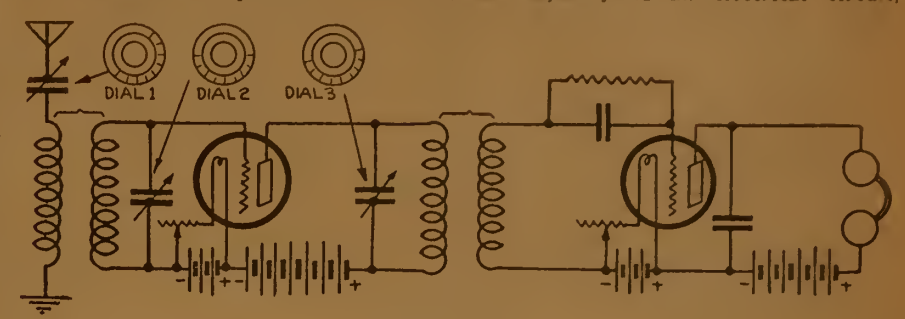


Figure 131

other end of the horizontal string, three other strings corresponding in length are also hung with weights. When one string at one end is set into motion, only the corresponding string at the other end will build up a similar motion, while the

either the inductance or the capacity may be reduced. To decrease the frequency at which an electrical circuit can vibrate, more capacity or more inductance or both can be put in. This increases the wave length.

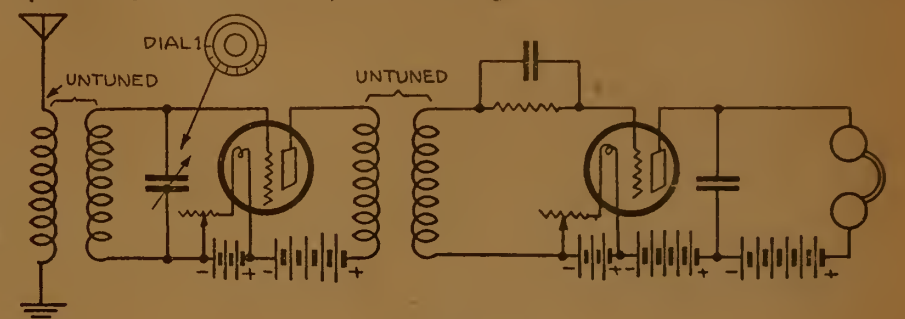


Figure 132

others dangle around. If two string pendulums are used with the same dimensions, the principle of tuned coupling is shown, as energy will be transferred by the swing of one pendulum to the other.

Tuning Aerial Circuit
 The aerial wire itself has inductance and capacity. A coil connected in series with it for simple adjustment, becomes part of the aerial circuit, so the frequency can be adjusted. When incoming waves strike through the aerial wire electrically (Continued on page 18)

Electrical Tuning

Electrical tuning occurs similarly but at much higher frequency. The deter-

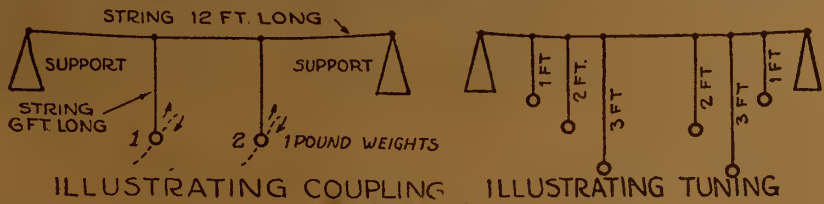


Figure 128

radiate energy to a receiving outfit. Some means is necessary to select the one desired. This is usually accomplished by electrical tuning. This is understandable by reference to mechanical tuning, as in a musical instrument.

timing to build up motion, is the other tuned wire of the pair. When a differently tuned wire is struck by the wind blast, the tendency to start motion is opposed by incorrect timing of the next successive air blows, so there is no motion.

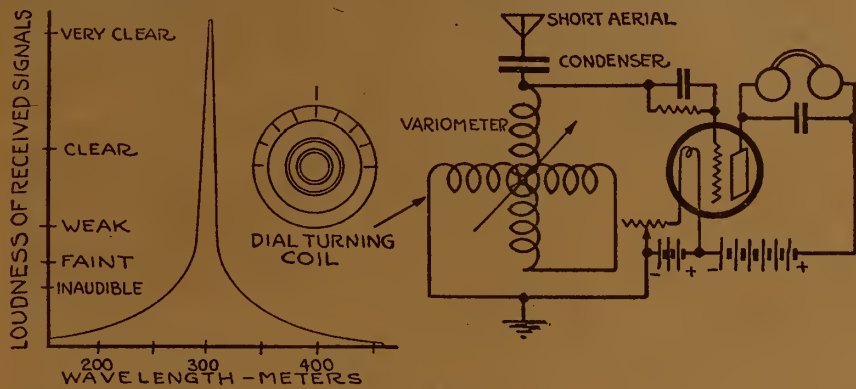


Figure 129

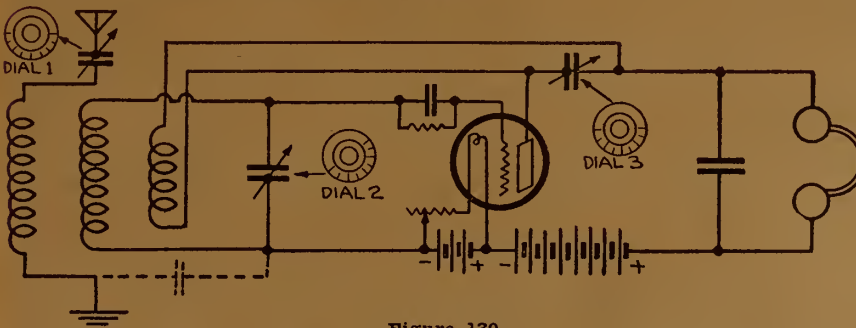


Figure 130

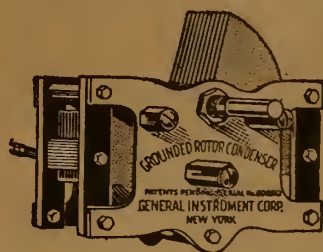
By operating the loud pedal of a piano to release all of its strings, one can sing a note with the voice and certain of the strings will respond with the same tone. The other strings will not do this, as the

Weights on Strings Illustrate Tuning

The same principle may be visualized by arranging weights on strings. Figure 128 shows strings arranged to illustrate tuning and coupling. A horizontal string

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Radio Digest

PROGRAMS
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Keep Out Undesirable Programs

Propagandists Should Have No Right to Broadcast

RADIO, like newspapers and the stage, motion pictures and current magazines, has a publicity power that in honest hands is a benefit of inestimable value, but under unscrupulous control may become a public menace and a delusion. Because of its newness, the power of Radio may benefit or harm is only beginning to be realized, but already there have appeared many signs that propagandists, religious zealots and unprincipled persons with axes to grind are seeking a way to reach Radio audiences with their peculiar brands of publicity. Only the vigilance of studio managers on a number of occasions has availed to sidetrack offensive or biased speeches.

Just as an editor must watch his news to guard against propagandists who seek to reach the public with cleverly concealed arguments, so the Radio broadcasting station must review the speeches that are to go out on the ether waves to the listening world. It is to the credit of the Radio broadcasters that thus far they have succeeded well in shutting the designing propagandist out of the air, thereby saving the vast host of listeners from many an appeal for unworthy objects. It is always possible, of course, to tune out unwanted Radio offerings, but if it were not that broadcasting stations take good care to keep out undesirable programs, there would soon be no Radio audiences.

Colonists Use Radio

The Great Northwest Uses Ether for Information

RADIO in Canada is mainly an agricultural institution, differing therefrom from Radio in this country which is mainly a means of urban entertainment. The Dominion government announces that 60 per cent. of Canadian receiving sets are on the farms.

The most interesting side of the matter is the extent to which such use of Radio is encouraged by Canadian authorities. In the prairie provinces of Manitoba, Saskatchewan and Alberta, the Radio is used deliberately to encourage colonization. Not only does it serve the practical purpose of dispensing useful information regarding crops, prices, etc., but by relieving the settler's loneliness and bringing him in touch with the outer world it reconciles him to his life. Thus Radio service, making farmers more contented, is accomplishing the settlement of more remote districts.

There is no more admirable use to which Radio could be put. The Canadian method is one that can be followed almost everywhere, and is going to play a big part hereafter in settling and developing the world's unoccupied areas.

One of the Largest Industries

New Art Getting Down to a Sound Basis

THE growth of Radio from an educational and social standpoint, has been so rapid that it has somewhat obscured its importance and significance as an industry.

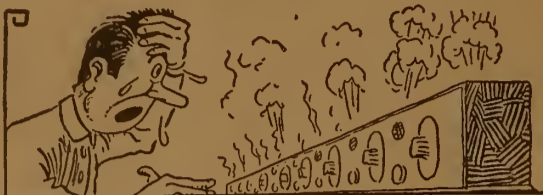
Even yet it is not generally realized that Radio within a few years has become one of the major industries of the country. Some idea of the magnitude may be realized from the fact that annual sales of Radio at present amount to more than those of sporting goods and cameras, are one-fourth as large as furniture sales, three-fourths as large as jewelry, and the same for musical instruments.

Actual figures in sporting goods, cameras, etc., show annual value of about \$185,000,000. Sales of Radio equipment aggregate almost twice as much as all kinds of sporting goods. Likewise the annual value of Radio business is nearly twice as great as that of the carpet and rug business.

It is well for Radio as an industry, and for the public who are benefiting so greatly from the new art, that the industry is getting down to a sound basis and gradually becoming stabilized. The sound basis comes from the fact that now it is better understood just what may be expected from a certain hook-up or set and how to use parts or sets to the best advantage to get the best results from their use.

RADIO INDI-GEST

Such Is Radio
De 5XV



Ten little tubes, superhetting in a line.
One went softly out; and then there were nine.

Nine little tubes perkin' rather late,
One tried the B Bat; and then there were eight.

Eight little tubes working like—er—heaven.
One overheated; and then there were seven.

Seven little tubes brought in politics.
One split its side; and then there were six.

Six little tubes humin' and alive.
One picked up La Follette; and then there were five.

Five little tubes tryin' hard to roar.
One lost its vacuum; and then there were four.

Four little tubes howling cheerfully.
One fell upon its tip; and then there were three.

Three little tubes finding lots to do.
One became a transmitter; and then there were two.

Two little tubes having lots of fun.
Short in the rheostat; and then there was one.

One little tube tried to outshine the sun.
Almost succeeded; and then there was none.

Its Winter in Los Angeles

Dear Mr. Indigest: "Spider Webb," your correspondent in a recent issue, is some gay old bear, isn't he? Is he too dead to know that winter has gone? I can't express my thoughts as he can, you know, in such dolled-up language, but here's how I think of him:

Please give gran'pa lots of air
With his set and his easy chair,
Here's to the dance with a lady fair
A sweet waltz flit'ring through the air

Pulses throbbing filled with joy
Twinkling feet of the girl and boy
Sunshine's bright—no clouds of gray,
Every "dog" must have his day.

Spider Webb, you're out of tune,
Winter's gone, you dead old prune,
Start the Radio? Don't you dare—
Gran'pa sleeps in his easy chair.

JACK.

And He Tuned in KOP

Burglar (after turning dial of Radio and arousing householder): "H—, I thought that was a safe!"
American Legion Weekly.

Mrs. Partington Speaks Out



Dear Indi: Mrs. Partington says that careless neighbor over to Mars who was killing off all the blackbirds in New Jersey, a spell ago, must have been shooting at her Court House tower lately, as the air she has been using to listen through has been all messed up and she jest knows she has been missing a lot of neighborhood news that she would have enjoyed listening at. She says she heard W. G. N.'s station advertising the Chicago Tribune mighty loud, Sunday morning, and that same night the pronouncer there said his advertisement had been answered already from way out to Australia. She says they ought to send him the paper three months, free, and throw in a phone cord or something like that for a prize on account of him hearing that far so quick.

SIGNING OFF.

At Thompson's One-Arm Lunch

Dear Indi: If Hazeltine eats at the Astoria, where will Neutrodyne?
SAFFRON.

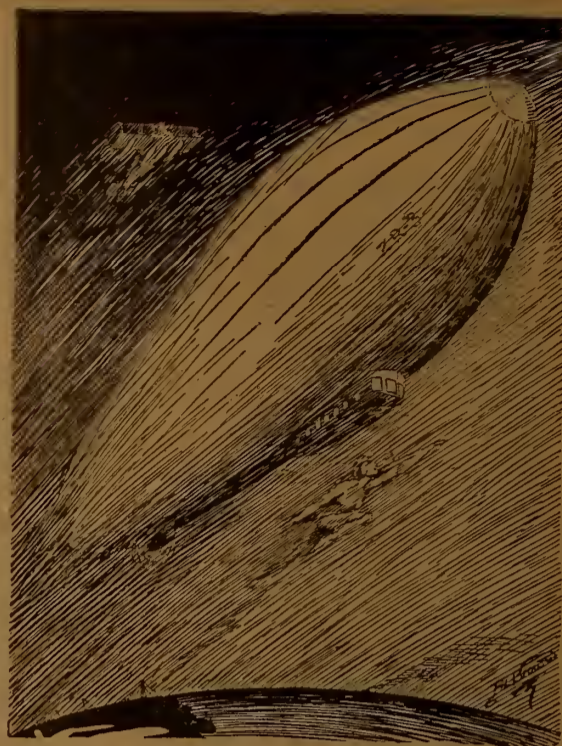
Thought for the Day

Little Jack Horner sat in a corner,
Tuning his neutrodyne set;
His circuits got crossed and five tubes were lost
And he hasn't got over it yet. PAPIKA.

He Keeps Time Thataway

Dear Indi: Whasa idea durin the WGN Sunday afternoon concerts of that announcer pluggin his phones in and out to see if the Dreck Onsonbul is done playin? Whyn't the big *** leave the music alone? Ast 'm, gwan, ast 'm. QRD-HADES.
*** Deleted by the Office Squirrel.

Guided by the Spirit of Radio



Condensed

By DIELECTRIC

Of late we have not been surfeited with broadcast debates—if ever we were—having for their subject matter theological, political, economic and other controversial topics. In view of that, the recent debate "Why women should bob their hair," Joe Toye courageously taking the negative side of the proposition and Paul Waitt the affirmative, provided a fair amount of entertainment to listeners to WNAC, Boston. Special prizes were awarded to those tuned to this station though none should have been necessary, as mirth was the order of the evening.

Very few indeed of the broadcasting stations have failed to place on nearly all of their programs musical selections intended for devotees of terpsichorean art with the result that not only homes but halls have thus profited. Parties have been specially arranged in a great many homes throughout the land where dancing was indulged solely by means of Radio jazz, or more dignified rhythm. The Radio audience was invited to dance where the orchestra played.

When it takes a hundred or more dollars to purchase a good receiving set in this country one looks askance at the midget Radio set retailing for \$1.75 in Germany, yet they are selling at a tremendous rate—40,000 sets in one week is the record of one manufacturer. The outfit is placed in one's hat to be used in transit. Sounds like "talking through your hat," but this is listening. They need business over there so let 'em go ahead and eventually these newly created fans will be demanding some of our American efficient receiving sets.

Perhaps as much fun has come to amateur Radio operators through the ability to visit one another by code messages as any other feature of their activities. Hundreds have become acquainted in this manner whose appearance is utterly unknown to each other. A new organization just started in Texas is an interesting venture to Radiophans. Regular weekly meetings are held Sunday afternoons with the sessions opened by the president with a roll call, to which each member responds. These members all operate amateur broadcasting stations and are scattered over the entire state. At each meeting some member speaks as the others listen. The entire meeting from beginning to end is conducted through the use of Radiophone messages. The meetings are a great success for attendance is easy.

One of the best known Canadian broadcasting stations is CKAC, owned and operated by La Presse, the foremost newspaper in Canada. Since the occurrence of fire in the plant, which proved so destructive, the station has operated on a 2,000-watt all-remote control system. This amount of power gave a very acceptable receiving range, though not sufficient for the purpose in mind, namely, to reach all French-Canadians in America. They now use 7,000 watts which probably entitles them to be called the most powerful station in the world. Parle vous Francais?

Ever since we listeners in have twirled the dials a station's carrier wave either brought us luck or interference. The electrical engineering staff of the University of Illinois, operating Station WRM are experimenting with broadcasting without the carrier wave continuously on the air. The effect of this departure seems to be much sharper tuning with greater ease in tuning out local stations to listen to distant ones. The carrier wave is used only as sound occurs in the mike. Next winter will be anticipated with greater pleasure than ever.

How to Install a Radio Set in Your Automobile

Part VII—Hupmobile Installation; Portable Receiver Circuits

By Harry J. Marx

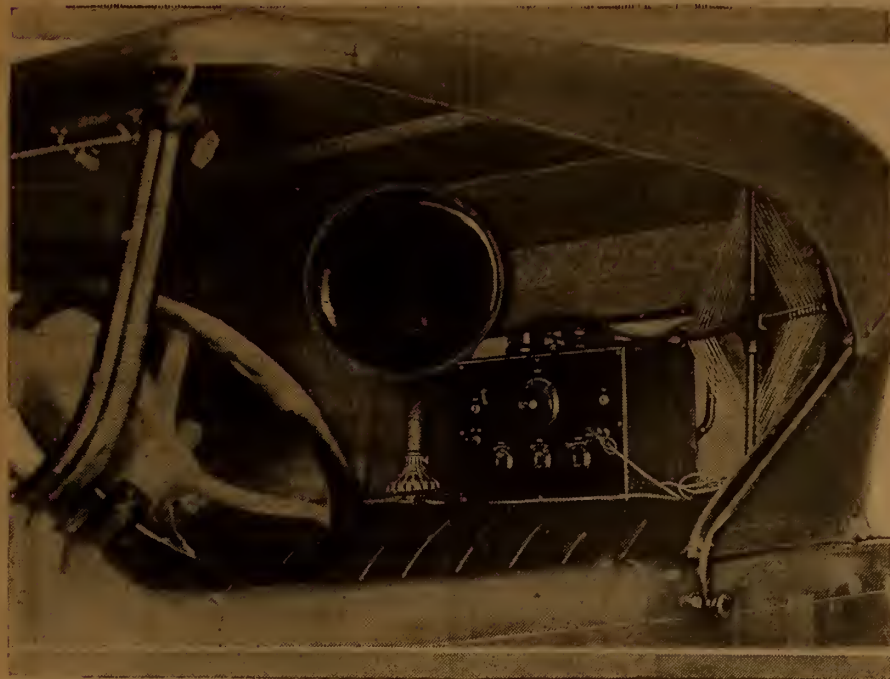


Figure 1

THEY call it "the smartest runabout in town" and claim its design was a happy inspiration suggested by the extreme brilliancy of the cars' performance and the desire to provide a body that would fittingly express the purpose of this charming model. That all may be true but there was that definite some-

thing lacking that made you doubtful as to its claims until a real Radio receiver was installed. Then indeed did the car fulfill all of those requirements that its style indicated. Just a little two seater runabout. Yes, three people could squeeze in but you know the old story about two being company and three a crowd. The other side helped balance out harmony of design. Yes, even a pair of head phones were found quite handy to have around. Installation is really the wrong word. No special fittings were required all that was necessary was to just stick the set in. So all you fans who have a Hupmobile

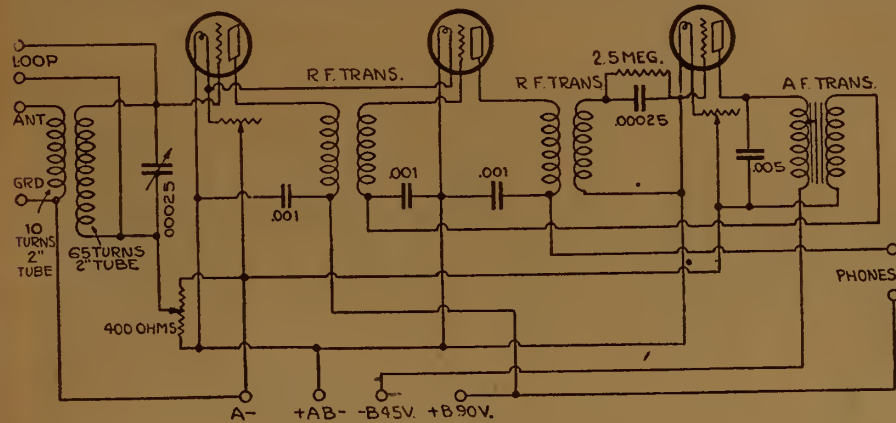


Figure 2

roadster have no alibi for not using a Radio set on your trips. There is ample room to put even a neutrodyne or a super-heterodyne on that back shelf. Just get busy and take advantage of the convenient space that is provided for it. Whoever told you that the little lady

thing lacking that made you doubtful as to its claims until a real Radio receiver was installed. Then indeed did the car fulfill all of those requirements that its style indicated. Just a little two seater runabout. Yes, three people could squeeze in but you know the old story about two being company and three a crowd. The other side helped balance out harmony of design. Yes, even a pair of head phones were found quite handy to have around. Installation is really the wrong word. No special fittings were required all that was necessary was to just stick the set in. So all you fans who have a Hupmobile

How is the set installed? That was the simplest part of the whole thing. There is a nice little shelf back of the seat just made to place your Radio equipment on. Underneath it is one of those convenient compartments that they use for tools and other little odds and ends that we like to store in our car but its just the thing to hide your B batteries away in. A batteries? Why worry, the car has a storage battery, use that. Antenna? This was a loop aerial set and there was ample room to put the loop on

Bradley Leak

THE PERFECT GRID LEAK
\$1.85
Condenser
35c



Working Range
1/4 to 10 Megohms

This remarkable grid leak has leaped to prominence within three months, and is pronounced by leading radio engineers, such as Crosley, Kennedy, Cockaday, Flewelling, and others, as the most perfect of grid leaks. It is not a cheap makeshift. It is the best that has ever been made. Try one, to-night, and be convinced.

Allen-Bradley Co.
Electric Controlling Apparatus

290 Greenfield Ave., Milwaukee, Wis.
Mfrs. of Universal Bradleystat

wouldn't enjoy riding around with you especially with a Radio set to while away the time at those moments where speech is silver and silence is golden.

Three-Tube Circuit

Figure 2 shows a long distance portable

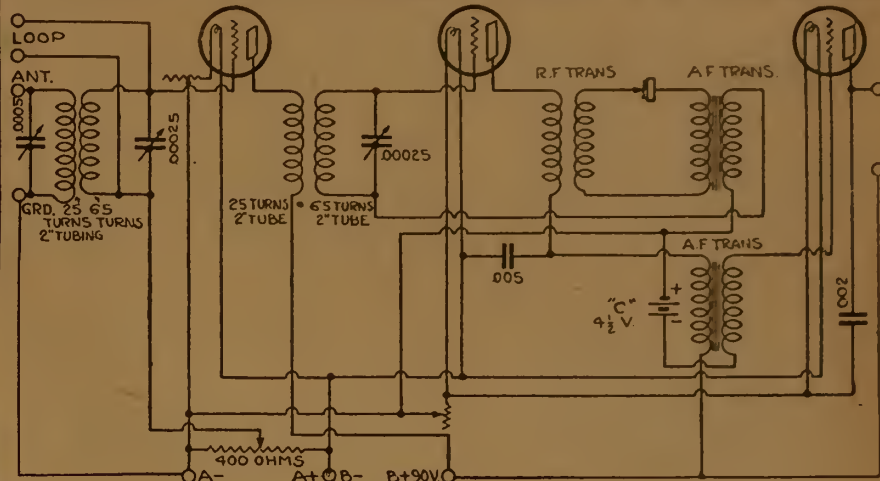


Figure 3

circuit that will be found especially adapted for using UV-199 tubes. Provision is made for the use of either a 4-wire cover antenna and a ground connection or a loop-aerial as desired. The controls having been reduced to a minimum; namely, a variable condenser, a potentiometer and two rheostats. When you get away from the city with its numerous stations interference and the demands for selectivity do not become such important factors so that simplicity

helps control the first tube and prevents any tendency for spilling over into violent oscillation. The circuit has two stages of Radio frequency amplification which is the transformer coupling. These Radio frequency transformers are of the untuned type. The vacuum tube detector is used and one stage of audio reflexed type to the secondary amplifier tube.

Another Three-Tube Circuit

This circuit has more controls for the fan who desires somewhat greater selectivity. In addition it uses a crystal detector and the extra tube is a pure audio frequency amplifier. Two tuning units both consisting of a 25-turn primary and a 65-turn secondary using number 22 dcc. wire wound on a 2-inch tube and spaced 1/2 inch apart are used in this set. Three variable condensers take care of tuning (Continued on page 20)

List of Parts Required

- 1 Special Tuning Unit.
- 1 .00025 Variable Condenser.
- 1 400 ohm potentiometer.
- 3 Sockets.
- 3 UV-199 Tubes.
- 2 Audio Rheostats.
- 2 Radio Frequency Transformers.
- 1 Fixed Grid Leak 2.5 megohms.
- 1 Audio Frequency Transformer.
- 2 .0001 Fixed condensers.
- 1 .002 Fixed condenser.
- 1 .005 Fixed condenser.
- 10 Binding posts.
- 1 Panel about 9x14 inches.
- 1 Cabinet as desired.

of control is a big asset and helps eliminate a lot of unnecessary parts which would otherwise require too bulky an assembly. The tuning unit is a fixed coupler consisting of 10 turns of number 22 dcc. wire wound in a single layer on a 2-inch tubing and on the same tube and

S. HAMMER RADIO CO.

303 Atkins Ave., Brooklyn, N. Y.

Never Before at This Price!!
Improved Cockaday 4 Circuit Receiver

- These Are GENUINE Complete Parts
- 1 Panel 7x24
 - 1 Precision Cockaday Coil
 - 2 Ansoco 26 Pl. Cond.
 - 5 Melco Tube Sockets
 - 1 Ansoco 6 Ohm Rheostat
 - 3 Ansoco 20 Ohm Rheostats
 - 2 Amplex Grid Deniers
 - 1 Durham Var. Grid Leak
 - 1 Ansoco 400 Ohm Potentiometer
 - 1 Bradley Leak
 - 2 Patent-Doub. Jacks
 - 1 Patent Single Jack
 - 2 Amertron Transformers
 - 2 Ansoco Switch Levers
 - 3 48,000 Ohms Lavite Resistances
 - 1 .00025 Dubllier
 - 1 .0005 Dubllier
 - 1 Pr. Como Dup. P. P. Transformers
 - 1 Panel, 1x12
 - 1 Sub Panel, 3x2 1/2
 - 1 7x24 Baseboard
 - 11 Switch Points
 - 2 Switch Stops, Wire, etc.
 - LIST PRICE \$72.45
 - OUR PRICE \$51.00

COMPLETE STANDARD PARTS FOR Neutrodyne 5-Tube Set

- 1 7x26 Panel, Drilled
- 2 Single Sockets
- 1 Triple Socket
- 2 Neutrodons
- 3 Neutroformers
- 2 Jefferson Transformers
- 1 Battery Switch
- 3 4 In. Dials, Fada Type
- 1 Power Rheostat
- 8 Binding Posts
- 1 Closed Circuit Jack
- 1 Filament Control Jack
- 27 ft. Insulated Tubing
- 27 ft. Tinned Bus Bar
- 2 Fixed Condensers, .006 Mfd.
- 1 Fixed Condenser, .00025 Mfd.
- 1 Grid Leak, 2 Megohms
- 1 Diagram for Above Set
- OUR PRICE \$30.50
- Wired Complete in Mahogany Cabinet... \$48.50

5-Tube Neutrodyne Set, wired complete in a mahogany cabinet—Genuine FADA Parts.
\$70.00

COMPLETE KNOCKDOWN PARTS
8 TUBE SUPER-HETERODYNE
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Our \$89.50
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- \$65.60 FADA KNOCKDOWN PARTS No. 167-A Sealed in Fada's Factory. Complete Parts..... \$49.00

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Crosley V 1-Tube...\$13.50
Crosley 51 2-Tube... 15.25
Crosley 3B 3-Tube... 34.50
Crosley XJ 4-Tube... 41.00
Crosley NJ Super 4-Tube\$53.50
Fada 160 88.00
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25% Deposit Required on Sets

ALL MAIL ORDERS SHIPPED PROMPTLY. Orders over \$5.00 will be shipped prepaid. Money orders or C. O. D. Not insured unless insurance charges included. Write for Price List

5 TUBE K. D. NEUTRODYNE

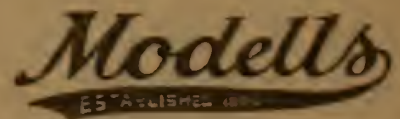


EACH KIT INCLUDES

- 3 Neutroformers.
- 2 Neutrodons.
- 2 Low Dielectric Var. Condensers.
- 1 Drilled & Engraved Bakelite Panel.
- 1 Stained Base Board.
- 5 Vacuum Tube Sockets.
- 3 4-inch Bakelite Dials.
- 2 2-inch Rheostat Dials.
- 1 Detector Rheostat.
- 1 Amplifier Rheostat.
- 3 Frost Neutrodyne Jacks.
- 2 Audio Freq. Transformers.
- 1 Bypass Condenser, 1 mfd.
- 1 Mica Condenser .00025.
- 1 Mica Condenser .001.
- 1/2 Megohm Grid Leak.
- 8 Marked Binding Posts.
- 20 Lengths tin copper Bus Bar Wire.
- 2 Lengths Black Varnished Tubing.
- Instruction book and blue prints.

LIST \$80.

Our Price.....\$26.95



America's Greatest Radio Retailers

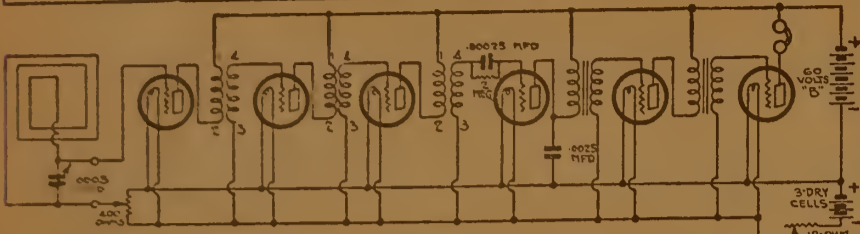
- 191 FULTON ST., Cor. Church
- 71 Cortlandt St., near Washington
- 14 Church St., near Cortlandt
- 140 West 32nd St., bet. 6th & 7th
- 15 Whitehall St., cor. Stone
- 241 West 42nd St., bet. Broadway & 6th
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MAIL ORDER DEPT.

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Super Crystal
New Non-Metallic Housing Eliminates Scratches & Squealing
Wonderful new crystal—has millions of sensitive spots—long life—cannot short circuit.
FITS ANY STANDARD DETECTOR
At your dealer—otherwise send purchase price and you will be supplied postpaid. Ask for reflex circuit 120.
50 Chas. Freshman Co. Inc.
Radio Condenser Products
106 Seventh Avenue, New York City

SUIT CASE HOOK-UP CORRECTION



The above hook-up diagram is given to supercede that given in the issue of May 31 with the article, "How to Make a Talking and Singing Suit Case," by S. R. Winters. While the original circuit showed the Radio frequency transformer connections right by numbers, the drawing was incorrect. The above hook-up uses the same apparatus as called for in the original. The position of the telephone receivers has also been changed to a point found better by experimentation.

THIRTY-MINUTE A-B-C

(Continued from page 15)

critical current of the same frequency will build up if the aerial circuit is thus tuned to that frequency, otherwise not. Thus it will be appreciated that the aerial circuit may be adjusted to pick up one certain Radio frequency and reject others. In receiving apparatus, this is further extended by additional circuit tuning, and it is possible to tune each individual circuit through the receiving set.

Figure 129 illustrates how a dial setting on a single circuit receiving set can make the detector subject only to Radio frequency of the range tuned to. Suppose you tune to 300 meters. That is the same thing as tuning to Radio frequency of 1,000,000 cycles. If the aerial is short and the circuit has little resistance, the detector will now be affected only by Radio frequency current closely approximately 1,000,000 cycles. Other frequencies can reach the aerial but will only build up feeble Radio currents in the tuned circuit.

Forced Vibration

If now the aerial is electrically hit by a powerful Radio wave front, the aerial circuit can act like a bell hit with a hammer and oscillations may be caused by forced vibration. A local broadcasting station may do this or natural pulses called static can act in such manner.

Kinds of Tuning

That is why secondary tuning is often resorted to. Referring to Figure 130, dial 2 can adjust the condenser of the grid circuit so that the frequencies accepted from the aerial circuit via the coupling coils, will still further be restricted. If a third dial is used to control the tuning of the plate circuit, further selection is possible. Too many controls are difficult to manipulate.

Tuned Amplifier

Figure 131 illustrates a tuned Radio frequency amplifier. Dial 3 adjusts the plate circuit so that a particular frequency is transferred to the detector. Sometimes this is done in two or three stages of amplification, making for fine selection. But if any one stage is improperly adjusted for the desired frequency, a station may not be heard.

Figure 132 illustrates a practical single control for tuning.

The procedure in tuning a set, is to get the input circuit tuned and then adjust the output circuit to suit. The reason why the usual regenerative set will have several adjustments at which the same station may be heard is that the inter-coupling between the circuits permits the several combinations to have a similar effect. In nonregenerative circuits, the tuning will usually be definite for a particular station to be heard, and this is the case for tuned Radio amplifier sets.



Thinking Radio?

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PREMIER PARTS

Quality Unsurpassed—For every known "Hook-Up" ALL GOOD DEALERS SELL THEM
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Other Kinds of Selection

Tuning is the principal reliance in selection but it is also possible to use other methods, such as phase tuning, directional tuning, mechanical tuning, etc. Tuning alone will not separate two broadcast stations of exactly the same frequency but a directional effect, as may be had from the use of a loop, will do this. Phase tuning is not much used in broadcast reception but its operation is to oppose the time relation of one received frequency to that of another, to balance it out.

(Interference is the bugaboo of Radio. However there are ways to get through and reach the long distance stations. The next article will deal with getting through interference.—Editor's Note.)

NINE-TUBE SUPER

(Continued from page 10)

tuned in, you can now adjust the tuned transformer by moving one coil nearer to and farther away from the other. This can be done while the set is in operation by using a wooden ruler or other non-conductor about a foot long. Moving this coil changes the peak efficiency of the transformer until it coincides with the peak efficiency of the iron core transformers. The final adjustment is moving the "pick-up" coil in its relation to the plate and grid coils until just the right amount of energy is absorbed from the oscillator to heterodyne both strong and faint signals for best results.

In connection with the audio frequency amplifier, it will be found that with 90 volts on the plates, the correct C battery



WORLD LEADERS

IN EVERY field of endeavor there is always a champion—a man, a product or a thing that takes the leadership, not by accident, but because of actual merit. In the new industry of radio, a leader has already arisen—Crosley Radio Receivers.

In new inventions, new simplified devices and new ways and means of giving greater radio value at a lower price, Crosley has constantly led. As a result, the purchaser of a Crosley Radio Receiver, knows that he is getting the last word in radio perfection.

This is evidenced by the fact that Crosley is building more radio receivers than any other manufacturer in the world. Above are illustrated two good reasons for Crosley supremacy—the Crosley Triridin 3R3 and Crosley Triridin 3R3 Special. These instruments are the latest radio engineering triumphs—three tube sets giving five tube efficiency.

They contain the following attractive features: Tuned Radio Frequency Amplification, Regenerative Detector reflexed back on the first tube, and an additional stage of Audio Frequency Amplification.

They are non-radiating, thus entirely eliminating neighborhood interference. For ease of picking up new and distant stations, perfect calibration and extreme selectivity, the Triridin is unequalled.

The only difference between the two models is in the size and style of the Cabinets. The Triridin 3R3 Special is completely self-contained, having places for the necessary dry batteries, headphones and other accessories. Over 200 experts have thoroughly tested the Crosley Triridin. Their opinions are one and the same. "There is no receiver to compare with it at any price."

Licensed under Armstrong Regenerative Pat. No. 1,113,149 Before you buy see the Crosley line

For Sale by Good Dealers Everywhere
The Crosley Radio Corporation
Powel Crosley, Jr., President

Formerly THE PRECISION EQUIPMENT CO. AND CROSLEY MANUFACTURING CO.
6493 Alfred St. Cincinnati, Ohio
CROSLEY OWNS AND OPERATES BROADCASTING STATION WLW

voltage is 4½. This part of the set should cause no difficulty.

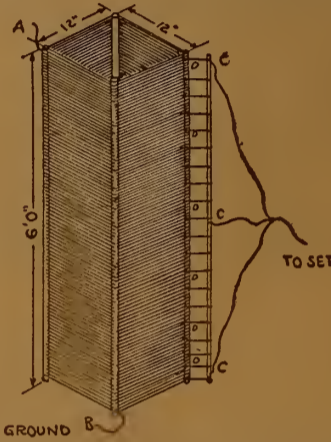
The drawings for the cabinet were shown on page 9 and it will be noted that the greatest dimensions are but 25 3/16 inches by 14 inches by 9 11/16 inches. This is very compact for a "super" although the actual space within this cabinet is probably about the same as though one built the set with an 8 inch by 44 inch panel and a depth of 8 inches. The advantage of my construction is that my set requires only a small table with a 30 inch by 24 inch top, with the batteries on a curtained shelf beneath.

(THE END)

Large Inside Loop

During the winter several of the outdoor aerials of our village came to grief through weather conditions, and as I had no desire to be deprived of my Radio in the event of anything happening to my aerial, I constructed an indoor aerial as illustrated herewith, and I became independent of the outdoor aerial.

A frame was made of perfectly dry wood 1 foot square and 6 feet long. I wound 133 turns of number 15 dcc copper wire around it, leaving the ends free, thus making 532 feet of wire. I tapped this



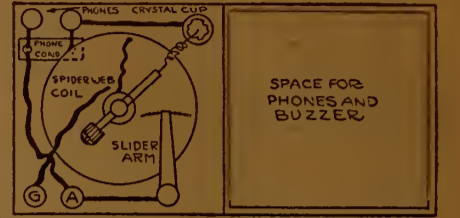
large coil at about every 6 turns as shown at D, and connected each tap with a piece of ½-inch copper tubing. This in turn I tapped at three places C and joined into one line as a lead-in to my set.

By the way of an experiment I connected the lower end of the aerial B to a nearby ground and received good results,

the body capacity being eliminated, the volume increased and all hissing being absent.—Fred Inwands, Wayburn, Sask., Canada.

Portable Crystal Set

The set is mounted on a cigar box in the manner shown in the illustration. The coil is wound spider web fashion with 24 sec. wire, for as many turns as can be put on a form that will fit on the cover.



The insulation is then scraped off so that the slider will make contact with all the turns of wire. The condenser value is .00025.—Herman J. Schweger, Appleton, Wis.

FADA "Low-Loss" Variable Condensers

Sharpen up your tuning, get greater volume out of your receiver by using the new FADA "low-loss" variable condensers. The low power factor and low equivalent series resistance proves their superiority. More efficient than many so-called precision condensers and have a capacity ratio of 40 to 1 as compared to the usual 30 to 1. Two sizes—No. 142-A (15 plate .0003 mfd) \$3.00 and No. 144-A (23 plate .0005 mfd) \$3.50. Your dealer sells them.

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STA-RITE RADIO BATTERIES are made especially for Radio and the big saving is made possible by coming direct to you instead of through distributors, dealers, etc. Boxes are made of oak, finished in mahogany and the plates very thick and will give a steady discharge over a long period. No premiums, just good, honest battery value.

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2 Volt for W. D. 11 and 12	\$4.00	6 Volt 60 Amprh... \$	7.50
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RADIO B. STORAGE Glass Jars, Heavy Plates—Case of 12 Cells, 24 V.....	4.90	6 Volt 100 "	10.00
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Get Yours Today—NOW—Send No Money

The batteries are fully guaranteed in writing and snipped subject to examination on the day your order is received. You pay on delivery or deduct 5 per cent if full cash accompanied order. You may deduct 10 per cent if two or more are ordered at one time.

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Scientific \$2.95

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SEND NO MONEY

Order by mail if your dealer cannot supply you and we will ship immediately. Written 5-day money back Guarantee with each set. Our next year's production schedule of two million phones UNDOUBTEDLY places us as the

WORLD'S GREATEST HEADSET VALUE

1. One of the finest phones on the market regardless of price
2. The most comfortable—weight only 8 oz.
3. Perfect tone mates.
4. Made of standard double pole construction—no single pole nonsense to save expense.
5. Made of the best materials money can buy. Powerful magnets, genuine tinclad cords, aluminum cases.
6. Manufactured under ideal working conditions.

WORLD'S LARGEST HEADSET MAKERS
THE TOWER MFG. CO.
98 BROOKLINE AVE. BOSTON MASS.

An Inexpensive Homemake Cabinet

Enclosure for All of the Equipment Used

THERE is no doubt but what the Radio equipment in combination with the Radio operator has caused some disturbance other than pleasant in the well kept home. The housekeeper is more than justified in her complaint and every

WORKSHOP KINKS EARN A DOLLAR—

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

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

effort should be made by all concerned to make Radio a more orderly occupation or pastime.

One way of doing this is to have a suitable place where most of the needed articles can be kept. At the same time the equipment should be kept under lock and key to prevent the intruder from doing damage to himself or to the equipment.

Materials for the Cabinet

When it is impossible to have a Radio room the next best thing is a good cabinet. The cabinet illustrated is good in appearance, simple to make, takes up little room and will generally add to the family peace.

Any wood may be used that is easily handled and strong enough to stand well.

Material List

- 2 Sides, 54 inches long, 12 inches wide and 3/4-inch thick
- 1 Top, 26 inches long, 12 inches wide and 3/4-inch thick
- 2 Shelves, 24 1/2 inches long, 10 3/4 inches wide and 3/4-inch thick
- 1 Shelf, 24 1/2 inches long, 11 1/2 inches wide and 3/4-inch thick
- 2 Strips, 16 inches long by 3/4-inch square
- 1 Piece for drop door, 16 3/4 inches long, 24 1/2 inches wide and 3/4-inch thick
- 1 Back piece, 41 1/4 inches long, 24 1/2 inches wide and 1/2-inch thick
- 2 Front doors, 41 1/4 inches long, 13 inches wide and 3/4-inch thick.

To make a very strong non-wobbling cabinet the best way to assemble the parts is to first assemble the parts C, D, F and E. These parts make a very strong box that should be well glued and nailed together. When the parts C, D, and F are together E is added after the manner of a desk lid or drop door. Very strong hinges must be used, also a desk chain or desk support on each side. With the desk lid closed the sides A are placed with the front edge on line with the closed box. This will leave a little space at the back that is needed in case the whole back of the cabinet is enclosed. To do this either wall board or light weight wood may be used.

The placing of the box compartment and shelf is about standard. They can of course be changed to suit the user. A very tall person would not be comfortable at a low arrangement.

As illustrated the idea is to use the top shelf for books, etc., the compartment for the receiver and the lower shelf for the batteries.

The doors, which make the appearance of the cabinet much more to be desired, are constructed very similar to making frames for screen doors. The frames are 2 inches wide and 3/4-inch thick. They are

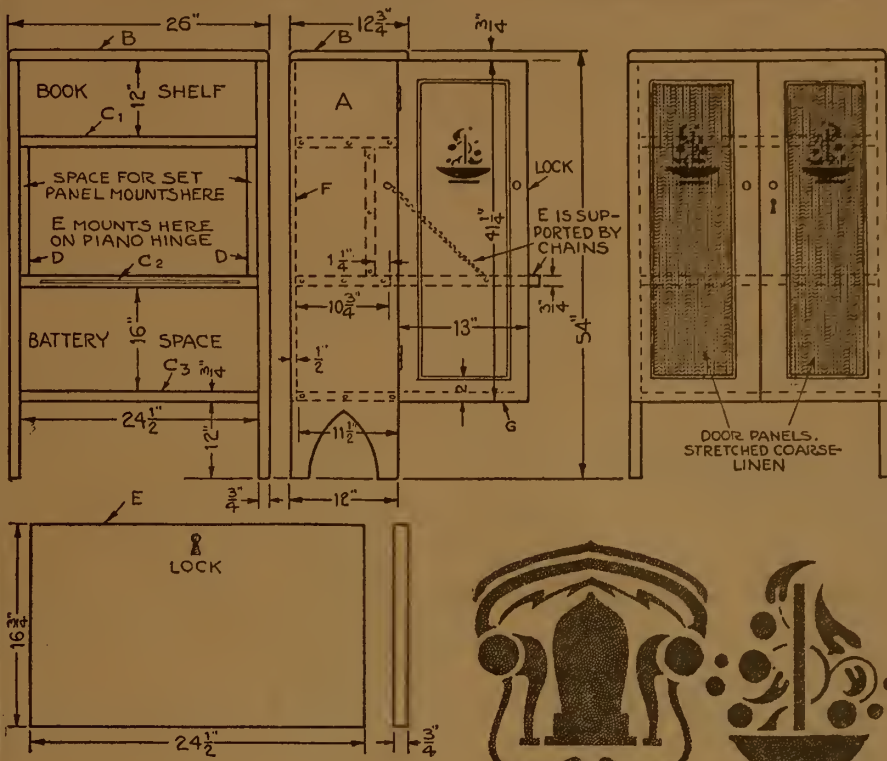


ON ONE TUBE

Broadcasting from Atlantic Coast, Mexico, Hawaii, Canada and Cuba heard in California by users of CROSS COUNTRY CIRCUIT. Range due to simplicity of set and only one tuning control. Easily and cheaply built by any novice. Dry cell tubes may be used. All instructions, blue print panel layout, assembly photo, etc. Postpaid 25c. Stamps accepted.

VESCO RADIO CO.
BX D-117 OAKLAND, CAL.

CONSTRUCTIONAL DETAILS OF CASE



hinged at the sides and when they are closed they cover the entire front.

The cabinet may be finished by any method but the simplest way is to stain and wax. The cabinet is first well sanded-papered then stained with any regular wood stain and finished with wax.

The door panels are covered with a piece of coarse linen, burlap or cretonne. Two stencil designs are offered for decorating the panel. One design symbolizes Radio and the other is a conventionalized basket that will be suitable for the most particular housewife's sitting room.

Color Schemes

Cabinet stained black with gray linen panels stenciled in dark blue. Cabinet stained green with dull black oil cloth panels stenciled in green. Cabinet stained brown with tan panels stenciled in orange or brown. Cabinet stained mahogany with cretonne panels matching the hangings used at the windows.

To Stencil

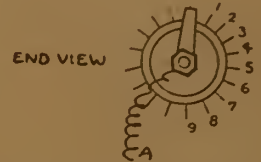
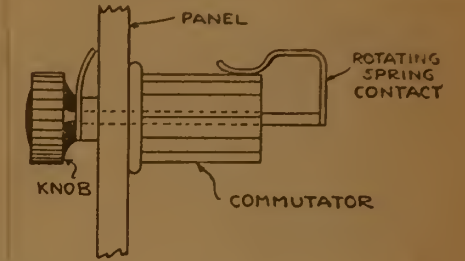
Transfer the design to heavy paper and cut out the black parts. To apply to the panels lay the door on a flat surface and using a stencil brush with a tapping motion, stencil with oil color as it comes from the tube. If unfamiliar with this method of applying design it will be bet-

ter to experiment on old material. Use as little paints as will cover the cloth. Do not attempt to stencil the material before it is placed in the frame as it will be impossible to stretch the material and not distort the design.

The cabinet may be made stationary by fastening with iron plates to the floor. Use two hole iron plates, using long screws to fasten one end of plate to the end of the leg. Then with screws through the hole in the other end of the plates fasten to the floor.—Bertha Graves Morey, Ottumwa, Iowa.

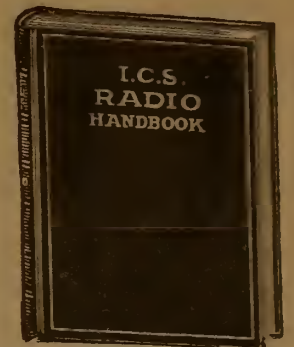
Old Commutator Good for Back Panel Switch

If you happen to have an old commutator for a direct current motor it can be used for making a back panel switch. It is only necessary to mount the commutator on the back of the panel and run a shaft through its center. A spring contact is attached to the end of the shaft so that it has a surface to make contact



with the commutator bars. A regular knob is attached for turning the shaft. Naturally the commutator bars are used to make connection to the taps on the coil and the shaft makes the other connection to the aerial or the ground in the regular circuit.—Earl Lett, Cherryville, Kansas.

The Greatest Book on RADIO ever written



only \$1

50,000 SOLD

Compiled by HARRY F. DART, E.E. Formerly with the Western Electric Co., and U. S. Army Instructor of Radio. Technically edited by F. H. DOANE

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

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You may dip into this I. C. S. Radio Handbook at random, or hunt up special information you want, or read it right through. Different types of receiving and sending hook-ups are explained; electrical terms and circuits; antennas; batteries; generators and motors; electron (vacuum) tubes; interesting experiments; definitions, and thousands of suggestions for getting more pleasure out of radio. Will save you from wasting money on things that won't work.

Send \$1 to-day and get this 514-page I. C. S. Radio Handbook before you spend another cent on parts. Money back if not satisfied.

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I enclose One Dollar. Please send me—postpaid—the 514-page I. C. S. Radio Handbook. It is understood that if I am not entirely satisfied I may return this book within five days and you will refund my money.

Name.....
Address.....

The "Goode" Two-o-One



Le Ton d'argent

Guaranteed

BY MAIL ONLY
\$2.39

Postpaid

QUARTER AMPERE AMPLIFIER-DETECTOR RADIO TUBE

GUARANTEED SATISFACTORY

All "GOODE" Tubes Sold Direct to the Consumer—No Dealer Profits

ONE—"Goode" Detector-Amplifier..... \$2.39
THREE—"Goode" Detector-Amplifiers..... 6.42

(All postage prepaid)
The "Goode" Two-o-One A Tube amplifies or detects. It is a quarter ampere, six volts, standard base silvered tube.
Send express or postal money order or New York draft to—

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A Boon to D-X Fans!

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ELECTRASOTE
REG. U.S. PAT OFF

RADIO PANELS

can be bought at any good Radio Dealer's Store

At 25 to 50% Less than any other standard panel

With these panels the surface-leakage and power-loss is reduced to the minimum—hence the volume of your set will be that much greater.

A good panel deserves proper handling—therefore, to get the best results, use a sharp drill with slight pressure. ELECTRASOTE is one of the "Sote" products of world-wide fame introduced by

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JOBBER AND DEALERS

Write for our interesting proposition.

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Exclusive Sales Agents for
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New Jersey

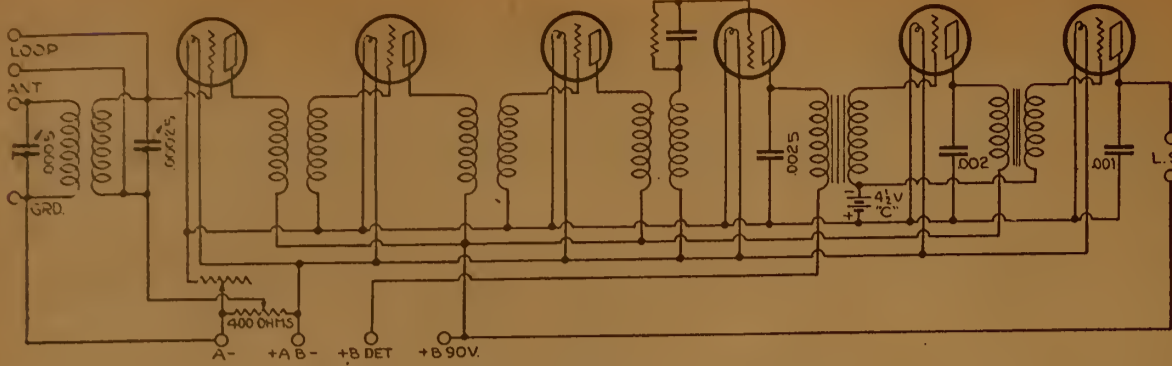


Figure 4

PORTABLE AUTO SET

(Continued from page 17)

... wave length while a potentiometer across the first tube. One stage of audio frequency after the crystal detector is reflexed with the second Radio frequency amplifier tube after which one stage of pure audio frequency amplification is obtained.

A somewhat larger panel will probably be required, but a 7 by 18 inch should be ample for this purpose.

Parts Required

- 1 .0005 Variable Condenser.
- 2 .00025 Variable Condensers.
- 2 Special Units.
- 3 Tube Sockets.
- 3 Amplifier Tubes.
- 1 Crystal Detector.
- 2 Audio Frequency Transformers.
- 1 400 Ohm potentiometer.
- 3 Rheostats.
- 1 .005 Fixed Condenser.
- 1 .002 Fixed Condenser.
- 1 4 1/2-Volt C Battery.
- 9 Binding posts.
- 1 Panel about 7x18 inches.
- 1 Cabinet as desired.

Six-Tube Circuit

For the fan who doesn't like to dabble with reflex circuits but wants loads of volume and plenty of opportunities for long distance work, the circuit shown in Figure 4 is presented. This hook-up has three stages of Radio frequency amplification, vacuum tube detector and two stages of audio frequency amplification. The three Radio frequency trans-

formers are of the untuned type. All tuning controls are at the input and consists of a primary and secondary variable condenser and a 400 ohm potentiometer. The inductance unit at input can consist of a variocoupler or fixed coupler similar to either of the types described in the two previous circuits. This circuit likewise is practical for either antenna or loop aerial use. The use of a C battery in

Parts Required

- 1 .0005 Variable Condenser.
- 1 .00025 Variable Condenser.
- 1 Tuning Unit.
- 3 Untuned Radio Frequency Transformers.
- 6 Tube Sockets.
- 6 Tubes.
- 1 Rheostat.
- 1 400 Ohm potentiometer.
- 1 Grid Leak 25 megohms.
- 1 Grid Condenser .00025.
- 2 Audio Frequency Transformers.
- 1 4 1/2-Volt C Battery.
- 1 .0025 Fixed Condenser.
- 1 .002 Fixed Condenser.
- 1 .001 Fixed Condenser.
- 10 Binding posts.
- 1 Panel about 7x21 inches.
- 1 Cabinet to suit.

the audio grid circuits helps clear up the reception and provides economical drain on the plate batteries. The tubes used should be UV-199's because of the high A battery strain that will result as the use of six of the A type tubes. With

UV-199's the detector plate voltage should be about 45.
(In the near future the Durant installation, as well as a portable set suspension device for automobiles, will be described.—Editor's Note.)

MAGNATRON
MAGNATRON DC-199 knows no superior among dry cell tubes. Whether as detector or as amplifier, it will give better results in your set. It and the MAGNATRON DC-201A are unqualifiedly indorsed by experts.

Your dealer has these tubes. They list at \$5.

CONNEWEY ELECTRIC LABORATORIES
309 Fifth Avenue NEW YORK CITY

Wave Length
A variocoupler or variometer have no wave length range. The wave length range is dependent upon the inductance and capacity of the other apparatus in the circuit that are used in conjunction with it.

A Tip About Tubes
Never try to operate vacuum tubes as amplifiers on potentials over 100 volts without proper grid bias batteries. Great distortion and probably burned out inter-tube transformers will result.

Workman Radio Service
"THE ACCENT IS ON SERVICE."
14-16 Vesey St. NEW YORK

VARIOCOUPERS

- \$3.50 Workrite 180° Silk Wound.....\$2.95
- 3.50 Fisher, Large, 90°..... 2.75
- 2.75 Fisher, 180°..... 2.25
- 4.25 Special Bank Wound Coupler for Hayes Circuit (with diagram)..... 3.25
- 7.00 Ambassador Coil (with diagram)..... 5.50

VARIOMETERS

- \$3.50 Workrite.....\$2.95
- 5.00 Pathe Moulded..... 2.25
- 3.50 Fisher, Large..... 2.85

CONDENSERS

- \$2.00 R. C. 11 plate.....\$1.05
- 2.25 R. C. 23 plate..... 1.35
- 2.75 R. C. 12 plate..... 1.65

VERNIER CONDENSERS

- \$4.00 R. C. 23 plate.....\$2.25
- 5.00 R. C. 43 plate..... 2.95

PHONES

- \$18.00 DR. SEIBT IMPORTED "SUPER HEADSET".....\$6.90
- \$12.00 N. & K., Imported.....\$6.90

The above items are just a few of our numerous attractive priced articles, which are contained in our BULLETIN OF RADIO PARTS. Gladly sent to you upon request.

We are headquarters for "Radion" and "Bakelite Dilecto" Panels. The best panel material available. Mail orders promptly attended to. Will ship C. O. D. unless remittance accompanies order.

What About It?
Isn't it about time to stop experimenting with multiple control circuits and build one that, combining ease of assembly and operation, loudness, clarity and selectivity of signals, as well as beautiful appearance, is excelled by none?

THE ELGIN SUPER-REINARTZ RADIO RECEIVING SETS

Embodies all the advantages of the well known Elgin Reinartz set which was largely responsible for the popularity of this wonderful circuit and many others. It is much louder, more selective, requires no storage battery, and can be used with excellent results on a short or loop aerial.

It has brought in 2LO England, and California stations two thousand miles from Elgin, clearly and without interference on a 1" id speaker with only one tube, and that while our powerful local station was broadcasting three miles away. Could you ask for more.

Send 2-cent stamp for circular giving one, two and three bulb hook-ups of this remarkable circuit.

ELGIN RADIO SUPPLY CO.
207 East Chicago Street ELGIN, ILLINDIS

WE REPAIR THE FOLLOWING RADIO TUBES

Dealers and Agents write for Special Discount Mail Orders Solicited and Promptly Attended to

WD-11, WD-12, Our Specialties

WD-11.....\$2.50	DV-6A.....\$2.50
WD-12..... 2.50	UV-199..... 2.50
UV-200..... 2.50	C-299..... 2.50
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C-300..... 2.50	C-301A..... 2.50
C-301..... 2.50	Marconi..... 2.50
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DV-1..... 2.50	6 V. Plain Det..... 2.50
DV-2..... 2.50	6 V. Plain Amp..... 2.50

H. & H. RADIO COMPANY
P. O. Box 22-A
Clinton Hill Station NEWARK, N. J.

KEYSTONE RADIO LIGHTNING ARRESTERS

\$1.50

At All Dealers

Buy your Keystone Arrester today—install it according to instructions supplied, and forget about lightning. Made of Bakelite—weather-proof. No vacuum to lose. Approved by Underwriters. At all Dealers, \$1.50.

Manufacturers of over a million Lightning Arresters

ELECTRIC SERVICE SUPPLIES CO.
17th and Cambria Streets, Philadelphia
53 W. Jackson Blvd., Chicago
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Great radio sensation coming

SHAMROCK-HARKNESS REFLEX

(Licensed-registered manufacturer)

Two tubes operate loud speaker — with wonderful clarity, selectivity and volume.

Watch for further announcement
SHAMROCK MANUFACTURING CO.
Dept. 31, Market St. Newark, N. J.

SHAMROCK
FOR SELECTIVE TUNING

EVEREADY Radio Batteries
—they last longer

Conspicuous for vitality and endurance —the right batteries by test and proof for every radio use.

NATIONAL CARBON CO., INC.
Headquarters for Radio Battery Information
New York San Francisco

CANADIAN NATIONAL CARBON CO., LIMITED
Factory and Offices: Toronto, Ontario

B-METAL

"AS GOOD AS B-METAL"

Signs and advertisements bearing the above words only serve to impress you with the real fact that our B-METAL Loud Talking Crystals have become the recognized standard in the radio crystal field.

Imitations of our B-METAL have appeared and have become so bold as to copy our literature and our packages, but if you will kindly look on the individual box cover for our full name as signed at the foot of this advertisement you are sure of getting genuine B-METAL Talking Crystals.

It is impossible to copy B-METAL quality and it is a simple matter to determine it by comparison with others sold as such, but lacking our firm name on the box.

B-METAL REFINING CO.
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FOR EFFICIENCY

Pfanstiehl PARTS

- Variocoupler..... \$5.00
- Variometer..... 4.75
- Silencer..... 8.00
- Oscillator for Superheterodyne..... 6.00
- 2-Stage Amplifier..... 17.50

Special inductances for all circuits

Manufactured by
Pfanstiehl Radio Service Co.
Highland Park, Ill.

ANTENELLA

Overcomes Static and Re-radiation!
No Outside Wires or Lightning Arresters Needed

Why pay \$10.00 or more to have an aerial spoil the appearance of your home? Antenella eliminates all unsightly wiring, lightning arresters, etc., and precludes the possibility of dangerous grounding on a power line. It also stops "canary bird" re-radiation from nearby oscillating sets interfering.

ANTENELLA
is not only a real distance getter, but also overcomes troublesome static.

At your Dealer, otherwise send purchase price and you will be supplied postpaid.

Ask for Circular A-40

Chas. Freshman Co. Inc.
Radio Condenser Parts
106 Seventh Ave., New York

Mitigation of Those Troublesome "Birdies"

How to Make a Radiation Interference Preventer

IF SWISHING, whistling sounds from neighbor's radiating receiving sets follow you around like buzzing insects, take heart, there is a remedy other than trying to stop the use of oscillating receivers. Stop some, and new ones start up daily.

A device can be attached to your receiving set that will cut out such interference. It may seem hard at first since the radiations from the neighbor's outfit are of the same character as broadcast radiations. The problem is simpler than static mitigation as the source and character of the whistling disturbances is known, and the radiations are not powerful.

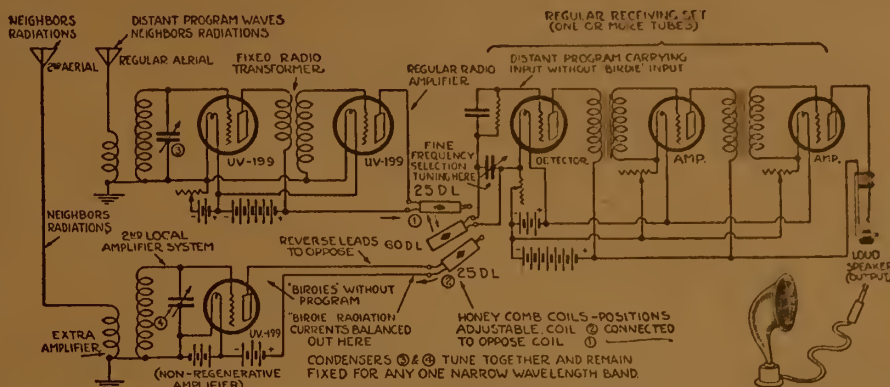
If you are not satisfied with such partial remedies as the use of less sensitive receiving apparatus or a loop receiver which gets no interference from neighbors located at right angles to the pointing of the loop, the interference mitigator shown in the accompanying diagram will be of interest.

Interference Mitigator

This attachment for any receiving set takes advantage of the differences in neighboring radiations and broadcast radiation carrying a program. In addition to the regular receiving circuit a second absorbing receiver circuit is used. The regular receiver circuit gets the distant program and the local disturbance radiations. The second receiver circuit is arranged to get substantially only the disturbance radiations coming from the neighbor's outfit. Then a simple balance is obtained opposing the two outputs, so that only the distant program radiations affect the audio amplifier and reproducer of your regular set. This is a phase tuning method supplementing the regular frequency or wave length tuning and directional selection. It can be used with loop or aerial input and accomplished at Radio or audio frequencies, but in the example illustrated, a Radio balance from two aerial inputs is shown. The second aerial may be a short one placed near the regular aerial. This mitigator does not prevent distant reception.

Cause of Whistles

Whistles are caused by beats from the interference of neighboring radiating outfits. Supposing you are receiving a 300 meter broadcast program, with 1,000,000 cycles frequency adjustment. Then your neighbor can swish his oscillating set within say 60 to 6,000 cycles of this and you will hear the audible beats. But this interference comes from a nearby source. From experience with Radio amplifiers you probably know that they serve to boost weak distant signals to sufficient value to operate a detector but do not proportionately boost strong local signals,



No whistling radiations coming from your neighbors' oscillating receivers can affect your reception of distance broadcast programs when this attachment is used.

because the detector can only handle a fixed amount of Radio frequency current. The "birdie" mitigator utilizes this principle.

As shown, one or two stages of Radio amplification ahead of the detector receiving set are used with the regular aerial input. This input gets the program from the distant station and the local "birdies" radiation. The second aerial input goes to a one stage Radio amplifier which is non-regenerative and tuned each time to the same wave length as the first aerial input circuit. The second aerial input from a smaller aerial, with the use of the one stage non-regenerative amplifier affords an output which gives the "birdies" radiation picked by the second aerial, but not the distant program because the second aerial and amplifier is not sensitive enough to be appreciably affected thereby. Even when the second system gets weak response on the distant program, this does not prevent operation of the mitigator because the program is brought through in much greater amplitude by the regular aerial system.

Two Outputs

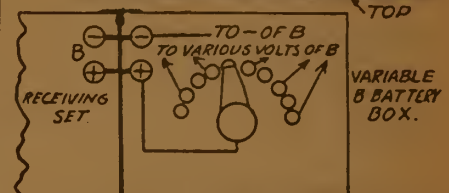
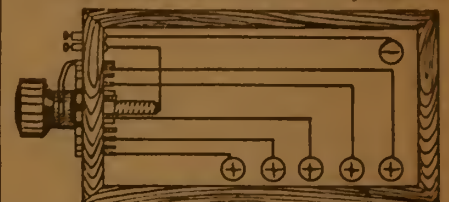
The result is that you have two outputs, one with the signals and "birdies" and the other with substantially exclusively

the "birdies." The two outputs are then opposed by the coils shown, and connections are reversed to get the opposing directions. A third coil takes the difference into the regular receiving and amplifying set. By adjusting the positions of the three coils, the input to the regular detector and audio amplifier outfit can be made to contain substantially exclusively the distant program without the "birdies." Standard units can be used for this eliminator and honeycomb coils on a triple mounting are suitable for the coils. This is a real step toward "birdie" elimination as it does the work at the receiving outfit. In a city where there is plenty of re-radiation from oscillating sets, the writer is able to receive broadcast programs in peace. Further improvements on this mitigator are being made. It is not difficult to set up and use.

Do not use a gas pipe for a ground, as this is strictly against insurance regulations.

B Battery Box

The illustration and description herewith are that of a neat and reliable variable B battery box. This box improves the appearance of the set as its cover the B battery. With this box you can shift from one voltage to another with a slight turn of the wrist. The plus and minus binding posts should be placed as



that they are just opposite those of your set. Alternate contacts should be dead as shown.—H. Kranks, Cincinnati, Ohio

Spacing Wire on Coils

When winding spider web coils care must be exercised to see that the spaces between turns are even. Even spacing is one of the factors controlling the efficiency of spider web coils.

PRE-AMPLIFIER

Registered



Makes Summer Radio Practical

THE TWITCHELL PRE-AMPLIFIER is a powerful Radio Frequency Amplifier attachable to any receiving set.

It brings in many distant stations which you cannot hear without it. Brings in with tremendous volume those you now hear only faintly. Makes your set selective. Prevents re-radiation.

Price complete with tube \$25.00

Shipped Prepaid

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1925 Western Ave. MINNEAPOLIS, MINN.

The duck migrates, but — the Hen stays at home and lays eggs

Radio is not a migratory proposition. 600 broadcasting stations, all over the U. S. A. are daily broadcasting programs summer and winter. The July program is equal in every way to the December. Let's not be fooled, let's take the moth balls out of set and set her up—and enjoy the warm evening—with a cool refreshing concert on the front porch—taken to the jingle of the ice in that good old home made lemonade.



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EIGHT BIG WAREHOUSES TO SERVE YOU

BIG CATALOG FOR DEALERS ONLY
DEALERS Write on your letterhead for this big catalog. Ask for A1002

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200% Profit

The new FAHNESTOCK Display Case Will stimulate your sales of Fahnestock Radio Products. 14 of the most popular styles and sizes are included. Shows the purchaser instantly the correct piece for his set. A constant invitation to buy Fahnestock Products. Dealers are offered 200% profit on each case, an unusual offer on standard merchandise.

Price to Dealer.....\$17.50
West of Mississippi..... 18.50
Transportation prepaid when money order or check accompanies order. Subsequent orders at regular price of \$20.00.

Contents Retail for \$51.50
Refills will be supplied at the regular 100 lot prices, shown in catalogue, which comes with case, less discount shown on enclosed sheet. Send check or money order, today.
FAHNESTOCK ELEC. CO.
LONG ISLAND CITY NEW YORK

BILTMORE MASTER REFLEX



The BILTMORE REFLEX, announced several months ago, was considered one of the most sensitive receivers manufactured, but now—We announce the BILTMORE REFLEX improved,—the

BILTMORE MASTER REFLEX

UNSURPASSED, in sensitiveness. With its one stage of tuned radio frequency, two stages of transformer coupled radio frequency, detector, and three stages of audio frequency amplification, each stage more efficient than if it were used in a "straight" receiver, this four-tube receiver equals and surpasses the best eight-tube set. Three thousand miles on the loud speaker is the distance many times accomplished on the BILTMORE MASTER REFLEX. And this with but a few feet of concealed wire and a ground. No outdoor antenna nor even a loop.

UNSURPASSED, in volume. If desired, the BILTMORE MASTER REFLEX will give tremendous volume. The largest hall or armory can be filled with loud, clear music with the BILTMORE MASTER REFLEX. A feat which few receivers can duplicate.

UNSURPASSED, in tone quality. Reflex receivers are used where perfect, true tone is required. The BILTMORE MASTER is the finest of reflex receivers and gives the finest of tone.

UNSURPASSED, in selectivity. Tuned radio frequency amplification makes the BILTMORE REFLEX extremely selective. Few receivers equal it in this respect, yet with but two controls, it is very easy to operate.

UNSURPASSED, in materials and workmanship. A finer machine could not be made. Constructed by experts, it is made from the finest parts. Radion panel and dials, National "Perfect" Low Loss variable condensers, Dubilier Micadons, Eads rheostats and potentiometers, Federal jacks, and Arne radio and audio frequency transformers. Each instrument the best in its class.

UNSURPASSED, in appearance. Our illustration imparts but a poor impression of the beauty of the receiver. Its beautiful Radion Mahogany panel, its heavy hand-rubbed mahogany cabinet, and its bright nickel metal parts make it a fine receiver for the finest home.

Unsurpassed, in value. The finest receiver made,

Price, \$100

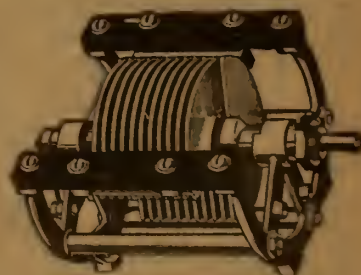
Send for literature giving complete description of this wonderful receiver, showing interior, etc.

DEALERS: We have a number of exclusive agencies for this receiver still open.

Write us at once,

The BILTMORE RADIO COMPANY
Dept. D. Boston 30, Mass.

BUELL E. J. Flewelling RADIO APPARATUS



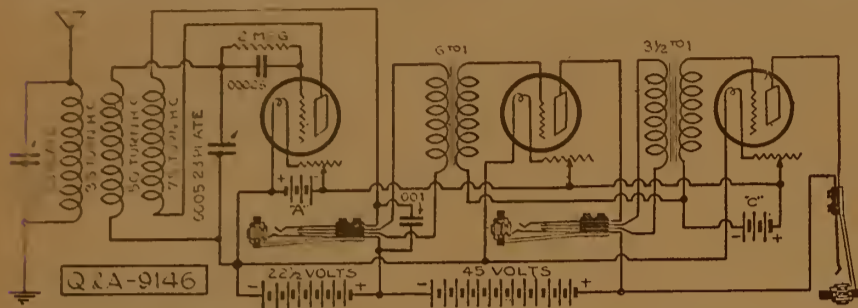
THE MOST STURDY of the New Type

LOW LOSS CONDENSERS

BUELL MANUFACTURING CO.
2977 Cottage Grove Ave., CHICAGO

Questions and Answers

H. C. Circuit and Amplifier
(9146) LRF, Kansas City, Mo.
I am sending you a diagram of a set I made and ask if you will make the necessary corrections for me?
It works fine on local stations, loud and



clear, though sometimes it has a very bad noise like frying in the head set. Before I spoiled it by putting transformers and extra tubes on, it was a fine receiver, getting many stations as far as Pittsburgh, Atlanta and St. Paul, but never got west of Hastings, Nebraska. An using good material with all American transformers and UV-199 tubes.

As it is now I can only get local stations loud and clear on the horn or phones. A.—We have noted carefully your difficulty in perfecting amplification with the circuit of sketch submitted and are advising that the action encountered evidences either that you have reversed primary of the transformer, that you have them too close together or that there is a discrepancy in making connections at some other point.

We are giving a diagram herewith showing the proper method of adding audio frequency amplification in two stages, which will doubtless be helpful in tracing and locating the factor which is acting as a detriment.

Condenser Tuning Range
(8961) LEM, Hutchinson, Kans.

I have been buying your Radio Digest from the news stands for the past year and have also built a neutrodyne 5-tube set from the articles that you have been publishing and I have had wonderful results with the exception of one or two items.

I wound my own neutroformers and have used number 24 cotton covered wire with 20 turns on the primary and 80 turns on the secondary and used a 3 1/2-inch diameter cardboard cylinder for the 50-turn coil and also a cardboard cylinder for the 20 turn coil that fits real snugly inside of the other coil.

I am able to use only 45 points on my condensers that the neutroformers connect onto and I am of the opinion that my condensers are not of the proper capacity for the coils or perhaps the coils are too large for any condenser. I am using a 17-plate condenser.

Please advise me as to how I can figure the proper proportions for coils and con-

densers so that I can get my set properly balanced.

A.—We have noted carefully your difficulties in operation of your neutrodyne circuit. If only forty-five degrees on condenser are in effect it is advisable to use

a smaller condenser or decrease number of turns on coil to reach the lower wave lengths. An approved combination is a sixty-turn secondary, fifteen-turn primary and a twenty-three-plate variable condenser.

Manufacturing

(8517) RRR, St. Joseph, Mo.
Will you kindly inform me if it would be unlawful for me to manufacture the following sets for market:

Neutrodyne, Reinartz, Miloplex, Reflex De Luxe and Flewelling?

What feature of parts of the neutrodyne are patented?

A.—All of the circuits named involve principles controlled by patent rights and to manufacture receivers employing them, without a license to do so, for commercial purposes is an infringement.

The principle of neutralized circuit capacity is the patented feature of the neutrodyne receiver.

Single-Circuit Troubles
(07982) RR, Peoria, Ill.

I have a single-circuit two-tube WD-11 set. At times when I turn the coupler or the rheostat I hear a loud knock and the music becomes weak, but clear. Please tell me how this can be remedied.

A.—The action encountered in operation of your receiver may be incidental to defective rheostat and unsteady filament current. Then, too, it could be due also to the way in which you adjust tuning units and could be eliminated by correct tuning procedure.

Trouble of this nature is sometimes due to defective transformer.

Honeycomb Coils in Reflex
(06583) ABP, Clayton, Mo.

Would it be possible to use two honeycomb coils in a reflex circuit, instead of the usual variocoupler? If so, what size should the coils be? I do not like using

a variocoupler because of the switch points.

A.—We are advising in your inquiry that the substitution of honeycomb coils for variocoupler in a reflex circuit is quite feasible. Thirty-five and fifty, or fifty and seventy-five turn coils can be used interchangeably for primary and secondary respectively.

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"Will Keep Your Set Alive"
Is "NOISELESS," increases volume and range with maximum clearness. Made of the finest material to give extra service. Are not two days old when they're sent to you.
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Large M'dm Small \$1.80 \$1.60 \$1.00
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3 Standard Base Bakelite Sockets	\$1.00
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1 Pr. Rubber Ear Cushions & New Radio Map	1.00
150 Ft. Stranded Tinned Copper Aerial Wire	1.00
36 Ft. Spaghetti	1.00
3 Honeycomb Coils—35, 50, 75 turns	1.00
1 HDOK-UP PKG. 12 Ft. Spaghetti, 24 Terminals, Tube Solderall, 3 Ft. Rosin Core Solder, 15 Ft. Tinned Wire	1.00
3 Bakelite Dials—3" or 2 1/2"	1.00
50 Ft. Genuine Copper Ribbon Aerial	1.00
3 Genuine Foote Triplo or Double Crystals, value, \$1.80	1.00
1 Reinartz Coil, value, \$2.00	1.00
1 Monodyne Set, regular \$10.00, EXTRA SPECIAL	5.95

Send for large, illustrated catalog No. 5G.

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CEDAR RAPIDS, IOWA

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Full instructions and Blue Prints furnished with each Kit. Absolutely guaranteed. These transformers are suitable for any Super-Heterodyne circuit. Put up in handsome Kit display box. Special discount to dealers. Prompt delivery. Write for special circular.
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He arranges in orderly fashion the mass and jumble of Broadcasting Stations that are seeking entrance to your set and brings 'em in, one at a time, so you can enjoy them! Never reduces, but nearly always increases volume. Add a Ferbend Wave Trap to your set and "Police" your reception. Regulate the Traffic!

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STEINITE opens up new possibilities for crystal sets. Don't delay the Radio treat in store for you. Send Dollar Bill today for 3 Crystals and free hookups. None genuine unless stamped "S" Two big Atchison Banks guarantee prompt refund if not delighted. Literature FREE.
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Radio-Phone Broadcasting Stations

Corrected Every Week—Part III

FIND MISTAKES AND YOU'LL GET DOLLAR

ONE DOLLAR will be paid to the Radiophone reader of Radio Digest submitting the most errors in any one station's listing in the Directory of Radiophone Stations, which appears in four parts, serially continuously, on page 23. Letters must reach Radio Digest's office not later than one week from date of issue corrected. Readers are not limited to correcting one station, but such corrections must be verified by the stations themselves, and NOT by comparison to other so-called accurate broadcasting directories or lists. Turn in corrections for as many stations as you can find—if you can find errors! Use separate sheet of paper for each station submitted and place name and address on each sheet. In case of tie, duplicate awards will be made.

NOTE.—The third part of the schedule list appears below. The fourth part consists of the remainder of the list and the complete state, city-station index will appear next week.

WAAZ, Philadelphia, Pa. 395 meters. 500 watts. Lit Bros. Club, "Morning Glory." Daily ex Sun, 12-12:55 pm, music; 2-3 pm, 4:30-6 pm, music, talks; 7:38-8 pm, Dream Daddy. Mon, Wed, 7:30-11 pm, entertainment. Fri, 8-10:50, entertainment; 1 am, 11-12, Eastern daylight saving.

WDAZ, Worcester, Mass. 360 meters. 10 watts. Samuel A. White.

WDAU, New Bedford, Mass. 360 meters. 100 watts. Slocum & Kilburn. Mon, Wed, Fri, 12:15-12:50 pm, industrial reports; 7:45-10 pm, music. Sun, 11 am, 12-30 pm, 7-8, church services. Eastern.

WDAY, Fargo, N. D. 244 meters. 50 watts. Radio Equip. Corp. "Slogan, 'The Biggest Little City in the World.'" Daily ex Sun, 9:30 am, weather. Tues, Sat, 7:30-8:30 pm, concert. Thurs, 10:30-12 midnight. Sun, 10:30 am, church service; 4-6 pm, concert. Central.

WDBA, Columbus, Ga. 236 meters. 20 watts. Fred Ray.

WDBB, Taunton, Mass. 229 meters. 10 watts. A. H. Waite & Co.

WDBC, Lancaster, Pa. 258 meters. 50 watts. Kirk Johnson & Co., Inc. Mon, Tues, Thurs, 8 pm, Eastern.

WDBD, Martinsburg, W. Va. 268 meters. 5 watts. H. E. Burns. Tues, Thurs, Sat, 9-10:30 pm, talks, music, dance orchestra. Eastern.

WDBE, Atlanta, Ga. 252 meters. 10 watts. Gilham-Schoen Elec. Co.

WDBF, Youngstown, Ohio, 246 meters. 50 watts. Robert G. Phillips.

WDBH, Worcester, Mass. 268 meters. 100 watts. C. T. Sherer Co. Slogan, "The Voice of the Heart of the Commonwealth." Daily ex Sun, 11:30-12:30 pm, music, reports. Mon, Wed, Sat, 8 pm, music. Eastern daylight saving.

WDBI, New Orleans, La. 242 meters. 10 watts. E. Budd Peddler.

WDBJ, Roanoke, Va. 229 meters. 500 watts. Richardson Wayland Elec. Corp. Slogan, "The Music City of the Old Dominion."

WDBK, Cleveland, Ohio, 248 meters. 100 watts. M. F. Broz, Furniture, Hardware & Radio.

WDBL, Stevens Point, Wis. 278 meters. 500 watts. Wisconsin Dept. of Markets.

WDM, Washington, D. C. 254 meters. 50 watts. Church of the Covenant. Sun, 11 am, church service; 8 pm, church service. Eastern.

WDBN, Bangor, Me. 292 meters. 10 watts. Electric Light & Power Co. Club, "Bangor Radio Club." Daily 4-5 pm, 7-8, Eastern.

WDBP, Winter Park, Fla. 240 meters. 50 watts. Boling College, Inc.

WDBS, Superior, Wis. 261 meters. 50 watts. Superior State Normal School.

WDBU, Salem, N. J. 254 meters. 10 watts. Morton Radio Supply Co.

WDBR, Boston, Mass. 236 meters. 100 watts. Tremont Temple Baptist Church.

WDZ, Tuscola, Ill. 278 meters. 10 watts. James L. Bush. Daily ex Sun, 9:30 am, 10, 10:30, 11, 11:30, 12 m, 12:30 pm, 1, 1:15, Chicago Board of Trade quotations. Central.

WEAA, Flint, Mich. 280 meters. 100 watts. Frank D. Falklin. Slogan, "The Vehicle City." Daily ex Sun, 12:15 pm, police, broadcasts, music. Eastern.

WEAE, Blacksburg, Va. 360 meters. Polytechnic Inst. WEAF, New York City, N. Y. 482 meters. 1000 watts. A. T. & T. Co. Slogan, "The Voice of the Millions." Mon, 4-5:30 pm, Tues, Wed, Thurs, Fri, 11-12 am, 4-5:30 pm, Mon, Tues, Wed, Fri, 7:30-10, Thurs, 7-12 pm, Sat, 4-5:30 pm, 7:30-11, Sun, 15-5:30 pm, Eastern daylight saving.

WEAH, Wichita, Kan. 268 meters. 50 watts. Wichita Board of Trade and Board of Commerce. Daily ex Sun, 9:45 am, 10, 11, 12 m, 1 pm, 2, market reports. Tues, Fri, 8-10 pm, music. Central.

WEAI, Ithaca, N. Y. 286 meters. 500 watts. Cornell Univ. Irregular.

WEAJ, Youngstown, N. D. 283 meters. 200 watts. Young of S. D. Mon, 8:30 pm, music, college activities. Central.

WEAM, North Plainfield, N. J. 286 meters. 100 watts. Borough of N. Plainfield. Mon, 8-10:30 pm, concert, talks. Eastern, Daylight Saving.

WEAN, Providence, R. I. 273 meters. 100 watts. Shepard Co. Daily ex Sun, 12-1 pm, 4-5, music, reports, weather, concert. Mon, Wed, 6-7 pm, Mon, Tues, Wed, Fri, 8-10, concert. Sat, 9-11 pm, dance music. Sun, 10:45-11:30 am, 7:30-8:45 pm, church service. Eastern.

WEAO, Columbus, O. 360 meters. 500 watts. Ohio State Univ. Daily ex Sun, 1:30 pm, Wed, Fri, 4 pm, lectures, music. Thurs, 8-10 pm, lecture, concert. Eastern.

WEAP, Mobile, Ala. 360 meters. 100 watts. Mobile Radio Co. Daily ex Sun, 4-5 pm, music. Tues, Thurs, Sat, 7:45-8:45 pm. Music. Sun, 3:30 pm. Central.

WEAR, Baltimore, Md. 261 meters. 50 watts. Evening News Pub. Co.

WEAU, Sioux City, Ia. 360 meters. 100 watts. David-Lit Bros. Co. Slogan, "The Heart of the Corn Belt." Daily ex Sun, 10 am, 11, 12:15-12:45 pm, 2, 5, Mon, Fri, 8-10 pm, concert. Sun, 7-9 pm, church services. Central.

WEAY, Houston, Tex. 360 meters. 1000 watts. Iris Theater (Will Horwitz, Jr.). Slogan, "Where All the Oceans Meet." Daily ex Sun, 12-1 pm, 4-5, music, reports, weather, concert. Mon, Wed, 6-7 pm, Mon, Tues, Wed, Fri, 8-10, concert. Sat, 9-11 pm, dance music. Sun, 10:45-11:30 am, 7:30-8:45 pm, church service. Eastern.

WEB, St. Louis, Mo. 273 meters. 500 watts. The Benwood Co., Inc. Tues, 9-10:30 pm, Wed, 8-9:30 pm, Sat, 7:30-9 pm, 11-1 am, 1 am, Central.

WEBH, Chicago, Ill. 370 meters. 1000 watts. Edge-water Beach Hotel Co.

WEBP, New Orleans, La. 242 meters. 10 watts. E. Budd Peddler.

WEV, Houston, Tex. 360 meters. 100 watts. Hurlburt-Still Elec. Co. Daily ex Sun, 10 am, 5:30 pm, weather, roads. Tues, Thurs, 8 pm, concert. Central.

WEW, St. Louis, Mo. 261 meters. 100 watts. St. Louis Univ. Daily ex Sun, 9 am, 10, 2, 5 pm, reports. Central.

WFAA, Dallas, Tex. 476 meters. 500 watts. Dallas News and Dallas Journal. Slogan, "Working for All Alike." Daily, 10:30 am, reports; 12:30-1 pm, address; 2:30-3:30, reports, news; 5:30, bedtime story; 6:45-7:30, sports, news; 8:30-9:30, concert, weather (silent Wed). Tues, Sat, 11-12 pm, music. Sun, 6-7 pm, Bible class; 9:30-11 pm music. Central.

WFAB, Syracuse, N. Y. 234 meters. 100 watts. C. F. Woese. Wed, 8-9 pm, dance music. Sun, 9:30-10 pm, Service; 10-11, concert. Eastern.

WFAF, Poughkeepsie, N. Y. 273 meters. 20 watts. H. C. Spryly Radio Co. Temporarily discontinued.

WFAH, Port Arthur, Tex. 236 meters. 150 watts. Elec-Supply Co. Mon, Wed, Sat, 9-10 pm. Central.

WFAI, Asherville, N. C. 360 meters. 50 watts. Hill-tide Wireless Instrument Co. Sun, 7:30-8:30 pm, church services. Eastern.

WFAM, St. Cloud, Minn. 273 meters. 10 watts. St. Cloud Daily Times. Daily ex Sun, 3:30-4 pm, markets. Mon, Wed, 7:30-9 pm, entertainment. Central.

WFAN, Hutchinson, Minn. 360 meters. 100 watts. Hutchinson Elec. Service Co. Slogan, "Gateway to The Ten Thousand Lakes of Minnesota." Located in the Heart of the Great Butte Belt." Daily, 11:55 am-12:30 pm, program, news, time, weather. Tues, 8-10 pm, program. Special hours. Central.

WFAQ, Cameron, Mo. 360 meters. 10 watts. Missouri Wesleyan College.

WFH, Sioux Falls, S. D. 258 meters. 50 watts. New Columbia College. Wed, Sun, 8-9 pm.

WFAV, Lincoln, Neb. 275 meters. 500 watts. Univ. of Nebr. Slogan, "The Home of the Cornhuskers." Daily ex Sun, 10 am, 11:40 pm, weather, news, road reports. Wed, 8:30 pm, concert.

WFBW, Cincinnati, Ohio. 309 meters. 500 watts. Ainsworth-Gates-Radio Co. Hotel Ains. Slogan, "The Station on the Hill." Wed, 8-10 pm. Sat, Sun, 10-12 pm. Central daylight saving.

WFI, Philadelphia, Pa. 395 meters. 500 watts. Strawberry & Clothier. Daily ex Sun, 10:15 am, reports; 1 pm, orchestra; 1:50, reports; 3-4:30, concert; 6-6:30, children's hour; 6:30-7, orchestra. Tues, Thurs, Sat, 7:30-9 pm, dance orchestra, S. concert. Tues, Sat, 10-10 pm, church services; 4:30, chapel service. Eastern Daylight Saving.

WGal, Lancaster, Pa. 248 meters. 10 watts. Lancaster Elec. Supply & Construction Co. Slogan, "Garden Spot of U. S. A." Mon, Wed, Fri, 7:30-9 pm, concert, lecture. Sun, 3-3:30 pm, church service. Eastern.

WGAN, Pensacola, Fla. 360 meters. 50 watts. Cecil E. Lloyd.

WGAA, Shreveport, La. 252 meters. 150 watts. Glenwood Radio Corp. Daily ex Sun, 12:30-1:30 pm, 7-8 pm, music. Sun, 11 am, 7:30 pm, church service. Central.

WGAW, Altoona, Pa. 261 meters. 100 watts. Ernest C. Albright. Slogan, "The Home of the World's Largest Railroad Shops." Wed, 9 pm. Sun, 10:45 am; 7:30 pm, Eastern.

WGAZ, South Bend, Ind. 360 meters. 250 watts. South Bend Tribune. Daily ex Sun, music. Mon, Wed, Fri, 7-8:30 pm, concert. Central.

WGI, Medford Hillside, Mass. 360 meters. 500 watts. Am. Radio & Research Corp. Slogan, "Amrad, the Voice of the Air." Daily ex Sun, 7:30-10 pm. Daily ex Sat, Sun, 12 m-1 pm, concert. Daily ex Sun, Mon, 6:30-7 pm, stocks; 7, Big Brother Club. Sun, 4-5 pm, 8:30-10, Eastern Daylight Saving.

WGL, Philadelphia, Pa. 360 meters. 500 watts. Thos. F. J. Howlett. Irregular schedule.

WGN, Chicago, Ill. 370 meters. 1000 watts. Chicago Tribune.

WGR, Buffalo, N. Y. 310 meters. 750 watts. Federal Tel. & Tel. Co. Slogan, "Key City of Industry." Daily, 10:45 am, weather; 12 m, reports; 12:30 organ music. Daily ex Sat, Sun, 12:30 pm, 4. Daily ex Sun, 2:30-4 pm, orchestra; 6:30, music; 7:30, news, Mon, Wed, Fri, 9-11 pm, concert; 11-1 am, orchestra. Sun, 3 pm, yep services; 4 organ. Eastern.

WGO, New Orleans, La. 242 meters. 100 watts. Daily state tele. Co. Slogan, "The Gateway to the World's Richest Valley." Tues, Fri, 9:30-12:30 am, dance music. Central.

WGY, Schenectady, N. Y. 380 meters. 1000 watts. General Elec. Co. Daily ex Sun, 11:30-12 m, 3 pm, reports, time, sports. Mon, Tues, Thurs, Fri, 2-3 pm, 7:45, concert. Fri, 10:30 pm, special. Sun, 9:30-10:30 pm, church service; 2:30 pm, Symphony Orchestra. Eastern.

WHA, Madison, Wis. 360 meters. 1000 watts. Univ. of Wis. Mon, Wed, Fri, 7:30 pm, lectures, news, agriograms. Central.

WHAA, Iowa City, Ia. 484 meters. 500 watts. Univ. of Iowa, Tues, 8-9:30 pm, Sun, 9-9:30 pm; 4 pm, once each month. Occasionally Thurs, 7-9:30 pm; Sat, 7:30-8 pm, Central.

WHAD, Milwaukee, Wis. 260 meters. 100 watts. Marquette Univ. Tues, 10 am, business talk. Wed, 7:30-8:30 pm, music, entertainment. Alternate Wed, 3 pm, business talk for women. Central.

WHAG, Cincinnati, O. 222 meters. 100 watts. Univ. of Cincinnati. No definite schedule.

WHAI, Norfolk, Va. 283 meters. 250 watts. Hafer Supply Co. Tues, Thurs, 9-11 pm; Sat, 10:30-11:30; Sun, 9-10 pm. Central.

WHAK, Clarksburg, W. Va. 258 meters. 15 watts. Roberts Hdwe. Co. No definite schedule.

WHAL, Columbus, Ohio. 286 meters. 150 watts. Avery Loeb Elec. Co.

WHAM, Rochester, N. Y. 283 meters. 100 watts. Univ. of Rochester. Rochester Times-Union, Democrat and Chronicle. Daily ex Sun, 3 pm, 4:15, 6:50, 7:30, 7:35-8:30. Sat, 10:45-11:23 am, dance music. Sun, 2:55 pm, Sunday school service; 3:15, Radio Chapel. Eastern.

WHAP, Decatur, Ill. 360 meters. 50 watts. Otto & Whelan. No definite schedule.

WHAR, Atlantic City, N. J. 271 meters. 20 watts. Seaside House. Daily, 2-3 pm, 7:30-8:30, Eastern.

WHAS, Louisville, Ky. 400 meters. 500 watts. Courier Journal and Louisville Times Co. Daily ex Sun, 4-5 pm, 7:30-9, Sun, 9:57-10:45 am, 4-5 pm, church service. Mon night, silent. Central.

WHAW, Wilmington, Del. 360 meters. 50 watts. Wilmington Electric. Slogan, "The First Broadcasting Station of the First City of the First State." Sun, 10-11 pm. Eastern, Daylight Saving.

WHAZ, Troy, N. Y. 380 meters, 500 watts. Rensselaer Polytechnic Inst. Slogan, "Transcontinental and International Broadcasting Station Located at the Oldest College of Engineering." Club, R. I. 1. students. Mon, broadcast, concert. Slogan, "The Voice of the Great White Wax." Daily ex Sun, 2:15-3:15, 3:45-5:30. Mon, 7:30-11 pm, 12-3 am, "Special Midnight Bohemia." Wed, 7:30-10:30 pm, Sat, 7:30-12 pm, Tues, Thurs, Fri, 9:30-12 pm, Sun, 3-6 pm, 9:30-12 pm, Eastern, Daylight Saving.

WHD, Des Moines, Ia. 326 meters. 500 watts. Bankers Life (Un. ex Sun, 9-10:30 am, market crop reports; 11:30-12:30 pm, New York Stock exchange; 2-4, close of markets; 11, music. Mon, Wed, Fri, 7:30-9 pm, music. Sun, 10:45-1:30 pm, chimes and religious services; 4-6, lectures, music; 7:30-9, music.

WIAB, Rockford, Ill. 252 meters. 50 watts. Joslyn Automobile Co. Mon, 9-10 pm, Fri, 8-9 pm, music. WIAC, Galveston, Tex. 360 meters. 100 watts. Galveston Tribune. Daily ex Sun, 12:35 pm, reports, occasional evening program. Central.

WIAD, Philadelphia, Pa. 254 meters. 100 watts. Howard R. Miller. Irregular schedule.

WIAP, New Orleans, La. 234 meters. 10 watts. G. A. DeCortin. Tues, 8-9:30 pm. Sun 10-11:30 am. Central.

WIAT, Springfield, Mo. 252 meters. 100 watts. Ilevr Stores Co. Slogan, "In the Heart of the Ozarks." Daily ex Sun 10:30-11 am, reports, news, weather.

Tues, 7:30-8:45 pm. Sat, 6:30-7:30 pm, music entertainment. Central.

WIAT, Neenah, Wis. 224 meters. 20 watts. Fox River Valley Radio Supply Co.

WIAX, Omaha, Neb. 278 meters. 200 watts. Daily Journal-Stockman. Daily ex Sun, 7:45 am, 9-10, 10-20, 12 m, 1:30 pm, 3:50, markets, weather. Central.

WIAD, Milwaukee, Wis. 360 meters. 100 watts. School of Engineering of Milwaukee. Slogan, "In the Land of the Sky Blue Water." Mon, Tues, Thurs, Fri, 11:30-12 m, music, news; 5-6 pm, music, news; 7-8, music, speeches. Fri, 10-12 mid, "Midnite Frolic." Central.

WIAG, Marion, Ind. 226 meters. 10 watts. Chronicle Pub. Co. Temporarily discontinued.

WIAS, Burlington, Ia. 283 meters. 100 watts. Home Elec. Co. Slogan, "Burlington, on the Mississippi." Tues, 8-9 pm, concert. Thurs, 7:15-8:15 pm, concert. Sun, 10:30 am, church services. Central.

WIAU, Le Mars, Ia. 360 meters. 20 watts. Am. Trust & Savings Bank.

WIAY, Washington, D. C. 273 meters. 100 watts. Woodward & Lothrop. Daily ex Sun, 10:30 am, 2 pm, news, music, talks. Eastern.

WIK, McKeesport, Pa. 234 meters. 100 watts. K & L Electric Co.

WIL, Washington, D. C. 360 meters. 5 watts. Continental Elec. Supply Co. Discontinued temporarily.

WIP, Philadelphia, Pa. 509 meters. 500 watts. Gimbel Bros. Slogan, "Watch Its Progress." Daily ex Sun, 1-2 pm, 3-4:30, 6-6:45, music; 6:45, markets; 7-7:30 pm, bedtime stories. Tues, Thurs, 8-10 pm, concert. Tues, Sat, 10-12 pm, concert. Sun, 4-6 pm, 9-9:30-12, Eastern, Daylight Saving.

WIAD, Waco, Tex. 360 meters. 150 watts. Jackson's Radio Engineering Lab. Daily ex Sun, 4-4:30 pm, news. Mon, Fri, 8-9, concert. Sun, 11-12 am, church service. Sun, 7:30-8:30 pm. Central.

WIAG, Norfolk, Neb. 283 meters. 250 watts. Norfolk Daily News. Slogan, "The World's Greatest Country Daily." Daily ex Sun, 12:15 pm, 5, 5:30, reports. Sun, 3:30-6 pm, music. Central.

WIAX, Greentown, Ind. 254 meters. 25 watts. Rev. Clifford L. White. Slogan, "The Radio Parson." Wed, 6-7:30 pm, Sat, 7:30 pm. Central.

WIAM, Cedar Rapids, Ia. 268 meters. 20 watts. D. M. Perham. Slogan, "Cerebral City of the World." Daily ex Sun, 10 am, 11:30, 1:30 pm, markets, reports; 7-8, music. Sun, 2:45 pm, music. Central.

WIAN, Peoria, Ill. 280 meters. 100 watts. Peoria Star. Slogan, "The Grandest City of Illinois." Daily ex Sun, am, 9:15-10:30, 12:30 pm, markets, weather, agriograms. Tuesday Thurs, 9:15-10:45 pm, concert. Sun, 11:30 am, church services. Central.

WIAQ, Topeka, Kan. 360 meters. 100 watts. Capper Publications. Irregular schedule.

WIAR, Providence, R. I. 360 meters. 500 watts. The Outlet Co. Slogan, "The Gateway of Southern New England." Daily ex Sun, 10:30 am, reports, news, music, talk, music. 1-05-2:15 pm, weather, reports, music; 7, weather. Tues, Wed, Fri, 7-8 pm, music. Wed, 10:30-12 midnight, dance. Fri, 8:15 pm, concert. Sun, 7:20-10:20 pm, concert. Eastern.

WIAS, Pittsburgh, Pa. 286 meters. 500 watts. Pittsburgh Radio Supply House. Daily ex Sat and Sun, 7:30-8:45, financial reports, news. Tues, 7:30-10 pm.

WIAT, Marshall, Mo. 360 meters. 10 watts. Kelley-Vawter Jewelry Co. Daily ex Sun, 5:15-5:45 pm, concert. Central.

WIAX, Cleveland, O. 390 meters. 500 watts. Union Trust Co. Slogan, "The Wave From Lake Erie." Daily ex Sat pm and Sun, 9-9:15 am, market reports; 9:30-10, women's program; 10:05-10:45, 2-2:45 pm, 4-5, financial reports, news. Tues, 7:30-8:30 pm, Thurs, 8-10:30 pm, entertainment. First Sat month, 12-30 am, "Night Caps." Eastern.

WJD, Granville, O. 229 meters. 50 watts. Denison Univ. Fri, Sat, 5-6 pm, music, educational lectures. Central.

WIX, New York, N. Y. 360 meters. 500 watts. De Brest Radio Telephone & Telegraph Co.

WIY, New York City, 405 meters. 500 watts. R. C. A. Tues, Thurs, Fri, 7:30-11:30 pm, concert. Sun, 2:30-5 pm, 8-10:30, Eastern, Daylight Saving.

WJZ, New York, N. Y. 455 meters. 500 watts. R. C. A. Daily ex Sun, 3-6 pm, entertainment; 7-11:30 pm, special program. Sun, 11 am-1 pm, church service; 7:30-10 pm, Eastern daylight saving.

WIAA, Cedar Rapids, Ia. 268 meters. 50 watts. H. P. Paar. Daily ex Sun, 12:45 pm reports; 3:30, reports, agriograms; 6-7, music Thurs, 11-12 pm, music. Sun, 4-5 pm, church service. Central.

WKAD, East Providence, R. I. 240 meters. 10 watts. Charles Looff.

WKAF, Wichita Falls, Tex. 360 meters. 100 watts. Radio Supply Co.

WKAN, Montgomery, Ala. 226 meters. 15 watts. United Battery Service Co. Wed, Fri, 8:30-9:30 pm, music, news. Sun, programs. Central.

WKAP, Cranston, R. I. 360 meters. 200 watts. Dutee Wilcox Flint.

WKAQ, San Juan, Porto Rico. 360 meters. 500 watts. De Brest Radio Telephone & Telegraph Co. The Land of Enchantment, Where the World's Best Coffee Grows." Wed, 8-10 pm, band; Fri, 8-10 pm, music talks, entertainment, inter-colonial.

WKAR, East Lansing, Mich. 280 meters. 500 watts. Mich. Agr. College. Off the air for the summer.

WKAV, Lacombe, N. H. 254 meters, 50 watts. Lacombe Radio Club.

WKAJ, Gainesville, Ga. 280 meters. 10 watts. Brecon College. Thurs, 8:30 pm, concert, college activities. Eastern.

WKY, Oklahoma City, Okla. 360 meters. 150 watts. WKY Radio Shop. Mon, 9-10:30 pm, Thurs, 9:30-11 pm, concert. Daily ex Sun, 7-7:30, sports. Sun, 11 am, 7 pm, church service. Central.

WLAG, Bancroft and St. Paul, Minn. 417 meters. 500 watts. Cutting & Wash. Radio Corp. Slogan, "The Twin City Radio Central in the Land of Ten Thousand Lakes." Club, "Tooth Brush." "Postcard." Daily ex Sun, 9:30 am, 9:40, 10, 10:30, 10:45, 11:30, 11:55, 2 pm, 2:30, 2:40, 4, 4:30, 6, 7:30, 9:15, markets, lectures, music; 5:30-6 pm, children's program. Mon, Tues, Thurs, 6:15-7 pm, music. Wed, Fri, Sat, 9:30 pm, music. Sat, 11-12:10 am, music. Sun, 10:30 am, 3:30 pm, 6:30, 7:45, church services. Central.

WLAH, Syracuse, N. Y. 234 meters. 100 watts. Samuel Woodworth. No regular schedule.

WLAK, Bellows Falls, Vt. 360 meters. 1000 watts. Mon, 9-11 am, machine co. Daily, 9-11 pm, Eastern.

WLAL, Tulsa, Okla. 360 meters. 100 watts. Naylor Elec. Co. Wed, Fri, 8 pm, music. Sat, 6:45 pm, Bible class. Sun, 11 am, 7:30 pm church services. Central.

WLAP, Louisville, Ky. 360 meters. 20 watts. W. V. Jordan. Tues, Fri, 9:20-10 pm. Central daylight saving.

WLAQ, Kalamazoo, Mich. 283 meters. 10 watts. Arthur E. Schillor. Daily ex Sun, 11:30-12:30 pm, Thurs, 10:30-12:30 pm, Sun, 2:30-5 pm. Central Daylight Saving.

WLAV, Pensacola, Fla. 254 meters. 20 watts. Elec. Shop, Inc. Daily Mon, Tues, Fri, 8-9 pm, music, entertainment. Central.

WLAW, New York, N. Y. 360 meters. 500 watts. New York Police Dept.

WLAX, Greencastle, Ind. 231 meters. 10 watts. Greencastle Community Broadcasting Station. (Putnam Elec. Co.) Tues, 7:30 pm; Thurs, 7:30. Sun, 7:45 pm, church services. Central.

WLB, Minneapolis, Minn. 360 meters. 20 watts. U. of Minn. Dept. Elec. Eng.

WLS, Chicago, Ill. 315 meters. 500 watts. Sears, Roebuck & Co. Daily ex Sun, 1-2 pm, farm program; 3:15-4:45, home maker's hour. Tues, Thurs, 6:30-1 am. Wed, Fri, 6:30-11 pm. Sat, 8-12 midnight, barn dance. Sun, 6:30-8 pm. Central, Daylight Saving.

WLW, Cincinnati, O. 309 meters. 500 watts. Crosley Radio Corp. Daily ex Sun, 10:30 am, 1:30 pm; daily ex Sat, Sun, 3, 4, reports. Mon, Wed, 8-10 pm, entertainment. Tues, Thurs 10-12 pm, music. Sun, 9:30 am, S. S. services; 11, 7:45 pm, church services; 8:15, orchestra. Central daylight saving.

WMAC, Ozenovia, N. Y. 261 meters. 200 watts. C. B. Meredith. No definite schedule.

WMAF, Dartmouth, Mass. 380 meters. 500 watts. Round Hills Radio Corp. Slogan, "The Voice from 'Way Down East.'" Temporarily discontinued.

WMAH, Lincoln, Neb. 254 meters. 100 watts. General

(Note.—The fourth part of the directory will appear next week, consisting of the rest of the station schedule list and the state, city-station index.)

Radio

Illustrated



Exercising to the tune of Radio music is a daily habit with Virginia Smith, dancer in the musical comedy Lollipop. International



An extremely selective loop aerial designed by Harry Herzog. It is composed of one loop placed horizontally across the top of the other and both are tuned by means of a dial. International



Bonnie MacLeary, well-known young American sculptress, uses a Radio to keep the mind of her small model, Patsy O'Neill, occupied during the tedious minutes of posing. U. & U.



This fair bather, one of the earliest of the 1924 season, brought out a blanket so she would be comfortable while listening in. © Atlantic Foto