

May 19, 1923

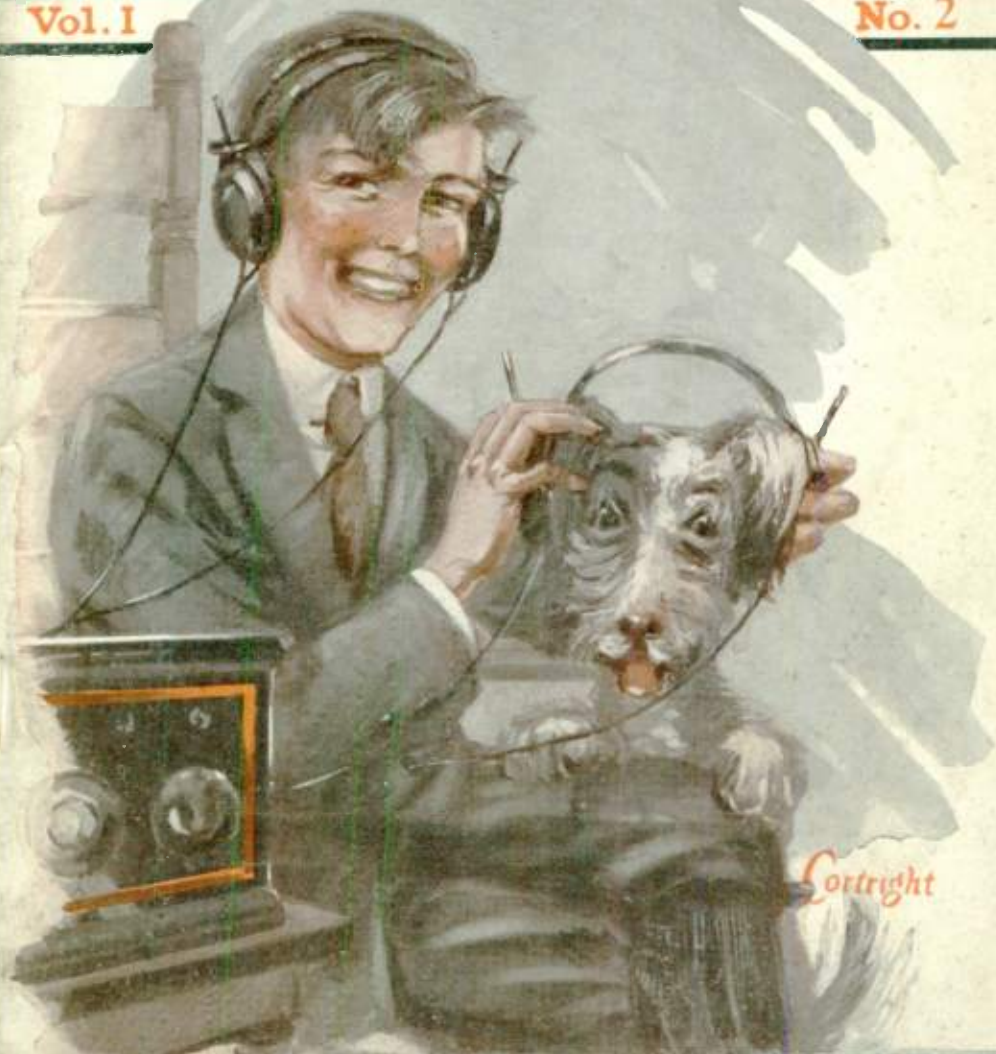
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LISTENING-IN

Devoted to the Interest of Radio
Fans in Western New York

Vol. 1

No. 2



"Radio Makes Us Immortal" Many Other Articles



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We extend our Congratulations to this City in being the home of such a "Live Wireless" Publication, and we believe that the Radio Fans and Radio Dealers of Rochester and vicinity should support it wholeheartedly.

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and WHEN and HOW and
WHERE and WHO."

Kipling.

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WHY does the date of Easter vary?

WHEN was the great pyramid of Cheops built?

HOW can you distinguish a malarial mosquito?

WHERE is Canberra? Zeebrugge?

WHO was the Millboy of the Slashes?

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Will W. Zimmer, Inc.

Publishers

47 North Clinton Ave.,

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When patronizing advertisers, tell them you saw their ad. in "Listening-In"

LISTENING IN

RADIO · ILLUSTRATED MAGAZINE

Devoted to the welfare of radio and everything
connected with it.

WILL W. ZIMMER, Managing Editor
(Front cover drawing by Geo M. Cortright)

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PUBLISHER'S PAGE

WE present the second number of "LISTENING IN" for your consideration. It contains not as many advertising pages as we would like, but it is just twice as large (in the number of pages) as was our first number and the text-matter and illustrations are, we believe, very much better.

We realize that our first magazine contained many imperfections, and, like all new publications, there was much room for improvement in both typography and text. We had many unusual conditions to meet here in Rochester, especially in connection with the printing end of manufacturing a high-grade magazine of large circulation within a very limited time, and we were compelled to omit many pages from our first issue in order to get the magazine out on the news stands by May 5th.

In spite of these difficulties, and the rawness of a newly organized staff, we did produce a rather attractive magazine, in the opinion of many radio fans. However, the comments on the first number were not all favorable, by any means! One criticism is that the page-size of "LISTENING IN" is too small.

Because certain things have been done in a certain way in the past, some people think that a change is not good. But progress is never made by sticking in a rut.

Progressive folks see the **advantages** of new and better methods—and we believe that there are many who will appreciate and like the compact, handy-to-read and convenient pocket-size of this lively, newsy, helpful and interesting (we hope) little publication.

A few evidently expected the first issue of "LISTENING IN" to be much thicker. To those all we can say is, "Give a feller a chance" as Rube Goldberg, the cartoonist, puts it.

We will be plumper after a few more issues. Just watch us grow. With a little time and the friendly co-operation of radio fans, we expect to improve each issue.

To enable us to produce a much better magazine, we have decided that it will be best to issue "LISTENING IN" twice a month during the summer season. Therefore, after our next edition, which will be the Memorial Day Number, we will publish this magazine every other week up to September first.

Our next issue will be out on the news stands on or before Memorial Day and we believe you will notice many improvements in it. We appreciate your patience and support and trust that our friends and all radio enthusiasts will not hesitate to send in any questions or suggestions which may assist us in producing a better and more helpful radio publication.

Will W. Zimmer

Radio Makes Us Immortal

Ether, most marvelous medium known in Science, permeates even our bodies and carries our thoughts forever through limitless spheres of Universe.

by Observer

Where are the radio waves of yesternight?

The bed-time stoies, jazzy and classical orchestra numbers, speeches, songs—all the medley of entertainment programs—what becomes of them after the radio fan tunes off for the night and hies off to the inviting hay?

Science, which has an answer for nearly everything perplexing, save income taxes and the spoutings of congressmen, has a solution of this problem also.

Pages of explanation could be written about it, but the answer can be put in the few words Tennyson wrote about a brook.

The radio waves go on forever!

Yes it is a fact. As established as two plus two making four. The sound transmitted through the ether—vibrations to be exact—continue on and on, beyond the earth's surface into the firmament where they travel from planet to star and back until time and the cosmic world are no more.

But let's get down to earth.

Ether is the medium by which this almost unbelievable phenomenon is brought about. Ether, the most marvelous and most mysterious element in the universe in the scope of man's conception.

It was from ether that all the worlds have been quarried and from ether all life has sprung.

Commandeering of ether in radio is an accomplishment so wonderful and masterful that the shades on the River Styx must gaze bewildered at what has taken place on old Mother Earth.

Ether explains the terrific speed of radio transmission.

If, in telephoning by wireless from New York to San Francisco, the voice should travel at merely the speed of sound, more than four hours would be required for the first word to reach

the Pacific Coast.

Slow, compared to the speed of radio.

On radio waves the voice is transmitted at the speed of light, which is 186,000 miles per second, so that there is no appreciable lapse of time in transmission of any sound to any distance on the earth's surface.

To put it another way.

If it were possible to establish radio communication with the nearest fixed star, Alpha Centauri, it would take four years, even by radio, to rbridge the gap. With merely the speed of sound, however, it would take four million years to reach this star.

Sound, then, is slow-paced compared to the speed of ether waves, but sound is not without its marvels.

You have often heard, on summer evenings, a katydid singing its vesper. This means that this little insect, by rubbing its legs and wings together, is able to disturb a cubic mile of air.

Marvelous enough, but more astounding still when you consider just what is shaken by the katydid. What does a cubic mile of air—common or garden variety of atmosphere—weigh?

Science has discovered that this amount of air tips the scales, or would tip them if the feat were possible, at six million tons.

All of which means that a small insect can set six million tons of air rapid vibration!

More marvels of ether.

Ether, all about us, is in a state of constant vibration of inconceivable intensity. It even fills up the gaps between the atoms of our body and thus the vibrations pass through the space we occupy as freely as though it were a vacuum. Consequently, we are unconscious of these vibrations.

According to Dr. Charles F. Brush, electrical inventor of Cleveland, it is

(Continued on page 50)

The New Broadcasting Wavelengths

Amateur Owners are not forgotten by Second Radio Conference, and if new allocation is adopted, educational features from colleges is assured.

WHEN the radio broadcasting of music and plays started in the winter of 1921-22 all the stations were put on 360 meters by a ruling from the Department of Commerce. For a time this was satisfactory when there were only a few stations scattered thru the United States. But with the steadily increasing number of stations last spring, interference became a problem to be solved. Radio experts urged to have government legislation and a wide band for broadcasting instead of one limited wave of 360 meters.

The assignment of new wave lengths for radio broadcasting and amateur stations was so much desired about a year ago, that the government selected a committee to revise the schedule of wave lengths and radio. Then the first Radio Conference composed of experts representing all interests of radio, developed a new program much as it is now going into effect. They worked for nearly a month for it was necessary to consider the various needs of the government, the commercial wavelengths, the broadcasting and amateurs. Finally in the fall it was taken up in the White Bill and passed the House of Representatives promptly. But it had no chance in the Senate and was lost.

By the middle of the past winter the interference of our broadcasting stations became very acute because radio developed much faster than our laws in regard to this new utility and congress had failed to do anything during the past year.

Consequently the Second Radio Conference, which closed in Washington recently, has brought out a new schedule of wave lengths, and Secretary of Commerce, Herbert Hoover, has secured sufficient authority to put the new arrangement of wave lengths into effect May 15th.

He said, in seeking special authority to effectually prevent interference "We were supported by literally the entire radio public. They wanted to be regulated. We are now left where, if we accomplish anything, it must be by organized co-operation during the next year."

As a result of this conference at which every organization interested in radio was represented, a proposed revision of the wave lengths assigned to each of the classifications was drawn up.

Besides the elimination of the general 400-meter wave, hereafter all government reports will be sent out by each station on its assigned wave, rather than on 485 meters, thus discontinuing use of this wave.

Amateur traffic will be permitted between the hours of 5:30 and 7:00 P. M. to relieve the crowded amateur at the later hours, and thus the amateurs who are to be considered for the part they have played and are paying in radio development, if for no other reason, are not neglected in the new project.

Some of the more important changes which this new allocation will bring about if adopted by Secretary Hoover, include a special wave length for inter-communication and broadcasting by colleges and universities, thereby assuring transmission of educational features.

What is especially important is that provision will be made for six separate bands of wave lengths for broadcasting service, properly separated and extending from 250 to about 546 meters.

This will permit of "staggering" of a district, that is, one station in a district will be able to broadcast at 360 meters simultaneously with another in the same district at 420 and another fixed between 475 and 525.

For the purpose of wave distribution without interference the country is divided into five zones. Assignments within these zones are for cities rather than for specific Class B stations, it will be noted.

The five zones include the sections of the country about the following cities:

Zone 1

Springfield, Mass., frequency, 890 kilocycles; wave length 337 meters.

Schenectady, N. Y., frequency, 790 kilocycles; wave length 380 meters.

New York City, frequency, 740, 660 and 610 kilocycles; wave length, 405, 455 and 492 meters.

Philadelphia, frequency 590 and 760 kilocycles; wave length 509 and 395 meters.

Washington, D. C., frequency 690 kilocycles; wave length 435 meters.

Zone 2

Pittsburgh, Pa., frequency, 920 kilocycles; wave length, 326 meters.

Chicago, Ill., frequency, 670 kilocycles; wave length 448 meters.

Davenport, Ia., frequency 620 kilocycles; wave length 484 meters.

Detroit, Mich., frequency 580 kilocycles; wave length, 517 meters.

Cleveland, Ohio, frequency 770 kilocycles; wave length 390 meters.

Cincinnati, Ohio, frequency 970 kilocycles; wave length 390 meters.

Madison, Wis., frequency 720 kilocycles; wave length 417 meters.

Zone 3

Atlanta, Ga., frequency 700 kilocycles; wave length, 429 meters.

Louisville, Ky., frequency, 750 kilocycles; wave length 400 meters.

Memphis, Tenn., frequency 600 kilocycles; wave length 500 meters.

St. Louis, Mo., frequency 550 kilocycles; wave length 546 meters.

Zone 4

Lincoln, Neb., frequency 880 kilocycles; wave length 341 meters.

Kansas City, Mo., frequency, 736 kilocycles; wave length 411 meters.

Jefferson City, Mo., frequency, 680 meters; wave length 441 meters.

Fort Worth, Tex., frequency, 630 kilocycles; wave length 476 meters.

San Antonio, Tex., frequency 780 kilocycles; wave length 385 meters.

Denver, Col. (reserved) frequency 930 kilocycles; wave length 323 meters.

Omaha, Neb., frequency 570 kilocycles; wave length 527 meters.

Zone 5

Seattle, Wash., frequency 610 kilocycles; wave length 492 meters.

Portland, Ore., frequency 660 kilocycles; wave length 455 meters.

Salt Lake City, Utah, frequency 960 kilocycles; wave length 312 meters.

San Francisco, Cal., frequency 590 and 710 kilocycles; wave length 509 and 423 meters.

Los Angeles, Cal., frequency 760 and 640 kilocycles; wave length 395 and 469 meters.

San Diego, Cal., frequency 560 kilocycles; wave length 536 meters.

Kilocycles will supercede meters in designating the transmitting waves of all stations next year.

What "Kilocycle" Means

In the tabulation above, it is noted that frequency in "kilocycles" is made the basis of the assignment. Dividing the speed of Radio waves, 300,000,000 meters per second, by the wave length, gives the frequency in cycles. A kilocycle is 1,000 cycles. In radiophony it has been found best to rate stations according to their kilocycles frequency, as it is the separation or difference in this frequency, one station to another, that will permit the listener-in to tune in the one and tune out the other.

The difference between each locality assignment, it will be noted, is 50 kilocycles. Another technical reason for this separation is to prevent audible heterodyning, sometimes called "beat notes," as a result of one station's frequency being too close in number to another's. The beat note is audible to most people when below 18 kilocycles difference exists between stations.

Stations will be rigidly required to keep within two kilocycles of their assigned waves. Constant check will be required to maintain accurate adjustments of the broadcast transmitters.

Radiceptors Club

J. D. Sheehan, Secretary

THE Radioceptors Club now has a membership of over 1200. Additional names are being enrolled every day, and it looks as though there will be at least 2000 members before June 1st.

The response to the appeal of the "Radio Fan" and to the letters mailed by the committee of the Radioceptors Club shows a fine co-operative spirit on the part of the fans towards the undertaking of the Radio Dealers' Club.

There was a little delay in mailing all of the cards as the original supply received was quickly used up.

At this writing, however, every Radioceptor should have received his card. If not, the committee will be glad to see that one is sent immediately upon being notified of the oversight. Several cards have been returned by the postoffice as having been incorrectly addressed. The committee will be pleased to mail cards to the proper address, if notified.

Judging from the cards and letters received by the Studio Director the broadcasting of the opening Rochester-Newark Baseball Game, which was given, play by play, by Jack Powers was thoroughly appreciated by the many listeners in Rochester and adjacent localities who were unable to see the game at the Ball Park.

The Radio Dealers' Club hopes to be able to do this again within the near future and is planning many other attractive features which will make you think twice before laying aside your radio set for other forms of entertainment.

Amplified Billions of Times

Imagine a man big enough to haul at one time all the freight moved in the United States in a year! But an average man could perform that super-Herculean feat if his strength were amplified as much as is the tiny flow of power from a radio-telephone microphone before it reaches the transmitting antenna.

In the studio of WEAf, the American Telephone & Telegraph-Western Electric radiophone station in New York, is a microphone of the condenser type. The minute capacity change which occurs when voice

"The Mystery of the Weird Music."

In which Miranda and Si solve the mystery of the eerie noise that arose nightly over the countryside, startling the woodland animals and the barn yard pets, will be featured in "LISTENING-IN" Magazine in the issue of May 26th. The tale is of special interest to the farmer.

waves impinge upon the exposed plate of the condenser microphone causes a change in potential on the grid of a three-element vacuum tube.

This tube and others amplify the feeble output of the microphone and overcome the resistance of the wire line from the studio to the Western Electric Company's building on

West Street. Here other tubes increase the power to such magnitude that they control the output of WEAf's high power oscillating tubes. From studio to antenna the power is amplified three thousand billion times.

To help you conceive this figure, imagine what an average man could do if his strength were amplified to that degree! Imagine all the locomotives in the United States working at their highest capacity, moving the largest haul in our history, as they did in 1918. That year our total freight movement was 408,011,453,783 ton miles.

Radio Lessons for Beginners

The Aerial or Antenna Circuit

THÉRE are radio waves of many different lengths or frequency travelling over the earth's surface and through everything except steel and metal framework. They are little affected until they meet a wire stretched out in space, or concealed in any wood or stone buildings. All wires and steel structures absorb some of these waves. If they are of a certain length so that they can tune in the waves they will absorb more.

To obtain the best results an aerial should be a good distance from any metal work having a length about the same as the aerial. Especially if it runs parallel to the aerial. Any wire or steel structure over our wire, or forming a net work around it will stop much of the waves. So the length of our aerial should be such that it's natural meter wave length is almost as much as the shortest meter wave length which we wish to receive.

By many careful tests, it has been found that an aerial about 100 to 130 feet long gives the best results. The lead-in should not be much over 30 feet when the flat top, or main part of the aerial, is 130 feet long.

If an aerial is 50 feet high, it will probably have a lead in about 45 feet long, so the flat top should not be much over 95 feet. This makes the total 140 feet and is about right. If an aerial is too long it causes the receiving outfit to tune more broadly. When the aerial is too short it does not bring in the signals as loud. For receiving, a single wire aerial is very satisfactory and more wires add very little to the results.

The flat top of the aerial may be in the form of a right angle and give excellent results. If the lead-in is from the center and there is about 90 feet both directions from it, the results will be very good.

To bring in the waves the best, we put a variable inductance or a

fixed inductance and variable condenser in series to tune our antenna circuit, this brings the strongest electric impulses through our circuit. These are radio frequency currents of electricity, and we must convert these into electric currents which will operate our head sets, and give us audible signals. We have two standard circuits to transfer the energy from our antenna to the detector, this in turn changes the radio waves to a form which are heard in our receivers.

In our next issue we will consider the single and double circuit outfits, using diagrams and giving complete descriptions of their use.

Radio Road Service

Automobile clubs in the future will become centers of advice to traveling motorists. They are such now, but the future will see them sending out advice as to roads and directions while motorists are speeding along the highway. It will be done by radio.

One inventor has designed an instrument for the automobile by which the driver can keep on the right track to whatever town he desires to reach by means or methods of radio signalling.

Wires strung along the road, carry the signals which are caught by the instrument on the dashboard while the car travels ahead.

This is only a crude beginning to what automobile manufacturers expect eventually to install in their cars. Radio receiving and telephone transmitting sets, compactly mounted on the right side below the dash, can be made to carry on conversations with the nearest automobile club.—“Radio Merchandising.”

We did not get out a “perfect” magazine with the first number—but we will improve with age.

A Frequent Question

"What is the actual value of a potentiometer, and how can it be connected into the circuit?" is a question that has come up hundreds of times.

When the ordinary type of B battery, tapped in the last few cells is used, the difference in the voltage can be varied only by $1\frac{1}{2}$ volt steps. A potentiometer makes a finer adjustment possible.

To hook one into a standard circuit, it is necessary to connect the negative of the B battery with the moving member, or slider, and the negative of the storage battery with the positive pole is connected with one end of the potentiometer, while the other end of the resistance element of the potentiometer.

The plate voltage can then be varied within small limits by moving the slider of the potentiometer from one end of the resistance element to the other.

Do not be annoyed if signals die away and then come back. It is probably due to fading and it cannot be remedied.

While a receiving set may be made to go inside a safety match box, such things are merely toys, and are not for household use.

Radio cabinets are now constructed in modern homes with a close-fitting door so that the set is entirely inclosed when not in use.

Neal Clement of Rochester, is a member of the students' orchestra at Rensselaer Polytechnic Institute, Troy, which has been broadcasting from the institute station WHAZ. Favorable comments on the work of the orchestra have been received from listeners in many parts of the United States.

If you like this magazine, tell your friends about it. If you think it can be greatly improved by adding certain features, why then, tell us. We will welcome constructive criticism and sensible suggestions from everyone who is sincere.

Get the Memorial Day Number.

Points to Remember

Forget everything you ever knew about the art, doubt anything that is told to you, light up your tubes and turn everything that is turnable. You will probably get just as good results as the expert, while they last, but if you want steady, consistent reception, get busy and work for it.

No detail is too trivial to overlook. Study the theory of Radio, find out just what each part does when you give the knob a turn to the right or left and why it does it. If you assemble your own set, solder everything tight.

Shield your set, not just on the back of the panel, but each separate piece of tuning apparatus, every transformer, and, to make it compete, every tube.

Then shield the top and sides of the cabinet. Keep the A and B batteries in perfect condition. Install the aerial high and make connections to the ground as deep and wet as possible.

Place the set on a solid foundation to prevent vibration, then and not until then can you invite your friends in for a given concert and give it to them—J. Hovey, Sylvan Beach, N. Y.

A microphone connected to the radio transmitting equipment of WGY, the General Electric Company station, was two feet in front of the speaker and picked up the words in 0.002 seconds.

Time required to transform sound waves into electrical energy, 0.002 seconds.

Time required for electrical vibrations or waves to pass from Schenectady to San Francisco, 0.0137 seconds.

Time required at receiving end to convert electrical vibrations into sound vibrations—0.001 seconds.

Total elapsed time from the speaker in Schenectady to the radio listener in San Francisco—0.0187.

Listener in hall heard words in 0.1332 seconds.

Watch us grow bigger with each issue.

Chemistry and Radio

By Smithson

AT first sight chemistry and radio seemed rather far remote but on closer examinations it will be seen that such is not the case. Radio is said to encircle the world. Chemistry may be said to pervade the world. Since signals start on this sphere it does not require the theory of Einstein or the philosophy of Kant to prove there may be a relation between the two.

As we enter an amateur transmitting station of the fast disappearing spark type, we note a peculiar odor, not unpleasant but rather invigorating. The answer is found in the formation of ozone from oxygen in the atmosphere. What has happened, chemically, is that two atoms of oxygen which usually form a molecule of that gas have been made to take up another of oxygen under the influence of the extremely high temperature of the spark and form the new gas ozone.

Quite frequently parts of our outdoor installation are insulated with asphaltum. This is merely a solution of the well known paving material in benzine or other solvent. Asphaltum is far superior to black shellac for in most cases black shellac is made by mixing ordinary orange shellac with lamp black, a fine divided form of carbon which is a conductor, although poor, of electricity.

Dials on variable condensers are frequently made of celluloid. Here the chemical explanation is found in a solution of nitro cellulose in camphor. Other products are added, of course, but the high explosive is made by treating cotton with nitric acid and then dissolving it in camphor.

The dials and engraving on your set would not be very clear and distinct if they were not filled with white lead, made probably by the old Dutch process whereby pure

lead is acted on by the vapors of Acetic acid.

In our storage batteries we use sulphuric acid, in a diluted form which acts as the electrolyte of our cell.

Finally we come to bakelite, whose chemical name is oxybenzylmethylaldehyde. It has a formidable name but it merely shows that it is a combination of formaldehyde and carbolic acid.

Chemically, phenol is the presence of an organic salt or organic condensing agent to produce the resinous material which we all use. It is not affected by ordinary acids or by ordinary high temperatures and still has a high dielectric strength.

Formica, another insulating material is an anhydrous (dry) redmanol fibre combining the strength of the fibre with the insulating properties of an improved bakelite.

These few instances show that the relation of chemistry to radio is more real than apparent.

In Deah Ol' Lunnon

No sooner did Jackie, proprietor of a restaurant in London, observe that many of his patrons were radio fans and that instead of sitting quietly at the table after a bit of food, they left and went "up to Romey's 'ouse, to listen to the radio," than he devised a plan.

He installed a radio in his restaurant.

It was simply unbearable to the proprietor to see his trade jog away in such fashion, so he said, said he to himself:

"Why not put up one of the bully things, and then instead of going to Romey's 'ouse, why they'll sit 'ere and henjoy a quiet cup o' tay?"

His innovation not only helped the restaurant keeper retain his old trade, but it has attracted a lot of new customers to his place, because "it's the only place in deah ol' Lunnon where you can listen in while you're having your joint and ale."

Builds Radio from Ford

"With four spools and an old tin can, he built a Ford and the darn thing ran."

Thus the man with the proverbial wooden leg built his Ford.

But in the case of Casey, it is the Ford which was used to build a little old radio—and the darn thing works too!

Frank Casey and Frank Leichey work in a garage in Plymouth Ave., Rochester, N. Y. One bright day there rambled into their garage a battered Ford.

As the Ford was nearly ready to "kick the bucket," the two mechanics decided to put it into good use, so they built from its worn out parts a complete radio outfit.

With the result of their ingenious work and a crystal set, they can get local station WHAM very clearly, and, say the "Franks", none of the squeaks or rattles possessed by the original Ford are heard in the radio set made of its "bones".



Frank Casey is shown above with his radio set manufactured from an old "tin lizzie."

Proper Aerial Location

In radio reception some means of collecting or intercepting the radio waves must be provided. There are several ways of doing this, but the most commonly used method is with the aerial or antenna.

The antenna may be one or more wires bare or covered, suspended horizontally or vertically, indoors or outdoors. In general the longer the wire (within certain limits) and the higher off the ground it is placed the better the results will be.

It is not generally known by the majority of experimenters that the lower the set is placed with respect to the aerial, the better the results are obtained, says the New York Globe.

For example, with the aerial 40 feet off the earth the best results are obtained with the apparatus on the street floor instead of in the attic. This is very strongly brought out when the experimenter tries it to his own satisfaction.

For broadcast reception a single copper wire about 100 feet long and as high as can conveniently be placed is usually as good or better than three or four wires 50 feet long.

An indoor aerial of the same length, height and distance above the instruments is not quite as good as one outdoors. This is especially true if the building has a metal roof or a large number of pipes or other grounded metal objects.

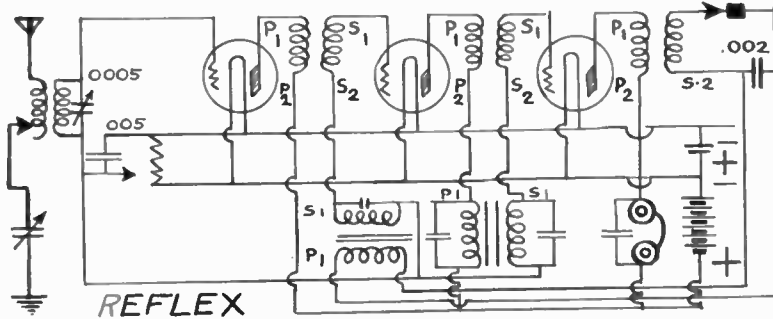
Apartment Has Radio

A new fifty-four apartment building now under construction, at St. Louis, Mo., will be equipped with complete Radio installation. A large central receiving station will be located on the roof with trunk lines to each department. In order for a resident of the building to listen in it is only necessary to push a button and they will be immediately connected.

Foreign countries buy approximately \$200,000,000 in radio supplies in the United States annually.

The New Reflex Circuit

(How it gives loud signals with less apparatus)



THE reflex circuit is one of the latest improvements in radio which is receiving attention from the experimenters. It seems to be a more efficient method of getting results with less number of parts.

The diagram which we give in this issue shows three tubes and a crystal detector. This is a very popular form of the reflex and similar to that used in the DeForest outfit with the small loop on the cabinet.

The principle involved is that the three tubes act first as radio frequency amplifiers and the output from the crystal detector is then turned back into the first or second tube so it also acts as an audio frequency amplifier. The final output is connected to the headset or a loud speaker. Of course this circuit is not the easiest to operate until one has become acquainted with some peculiarities of the reflex. Then the adjustment of the crystal detector gives a little trouble which is eliminated by the addition of another tube as detector.

The new Fada Neutrodyne receiver is a form of the reflex circuit with a vacuum tube detector. It uses only one tube reflex and has one tube extra for the second stage audio frequency amplifier.

This reflex circuit corresponds to three stages of radio frequency amplification, detector and two audio frequency amplifiers. The "B"

battery is 80 volts. The potentiometer resistance is 400 ohms. The tuner is a vario-coupler.

The secondary tuning condenser has a vernier attachment. Three radio frequency amplifying transformers are shown in the diagram between the tubes. A crystal detector rectifies the signals. The other two amplifying transformers are of the radio type.

The by-pass mica fixed condensers across the audio transformer windings and the phones are .002 microfarads. This can be used with a loop antenna and with a loud speaker. All wires should be as short as possible and none run close together or parallel.

"Everette True"

A friend of ours dropped in the other day and after we had a cup of tea, we naturally started in to talk "radio." She was very much interested, but couldn't understand "what all those little do-funny little dihinkys are twisted for." Then I knew I was in for it, because there is nothing that I dislike more than explaining the theory of tuning to a novice, because they always say, "Oh! I see, then this is that and that is this," or words to that effect, and then I have to go all over it again and explain that this is not that but that that is that, and this is this. Am I right?

R. W.

Rum Runners Use Radio

Already handicapped by a far-flung boundary line, and countless roads suitable for travel, the prohibition forces of Ontario and Quebec are now face to face with the newest problem science has to offer.

Radio, according to latest advices, is being used to pilot booze cars down the trail from Quebec to New York State.

Each smuggler, on starting his trip, communicates by telephone with "Headquarters," notifying them of his location and the time of his start.

"Headquarters" in turn spreads the glad tidings to its various stations, here lookouts are in readiness to assist the runner on his way.

Fishing on Sunday

And the little radio makes fishing a pleasure, more so than ever before because one may be hauling in a catch even while receiving the parson's sermon via radio.

Fred Mueller, of Fort Worth, Tex., has rigged a complete radio set on his power launch, and every Sunday Fred is out fishing, at the same time getting radio-ed church services.

Not only that, but campers about the shores of Lake Worth, near the city, are able to enjoy the services, which are broadcasted from Fort Worth and amplified by means of Mueller's receiving apparatus. Mueller is pictured here operating his receiving set on his motor-boat.

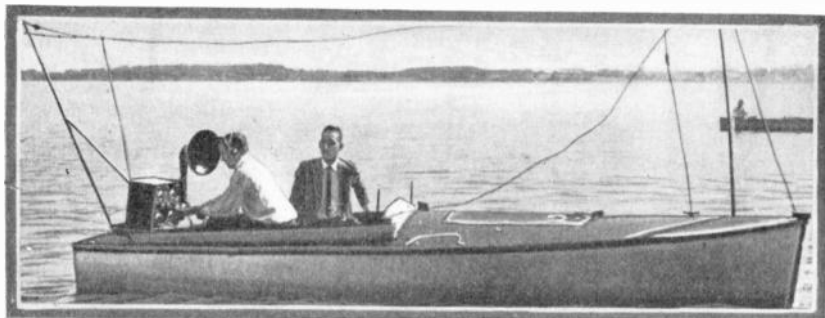
Hotel Statler To Broadcast

As a fitting celebration of the first birthday of Radio Broadcasting station W G R, the entire station will be moved to Buffalo's new Hotel Statler. This marks the end of the first year of W G R's useful and entertaining service and ushers in another year which will probably see this station become even a greater factor in the welfare and happiness of the community immediately surrounding it, and will make available its entertainment and news services to even larger areas than it has previously reached.

The new location is of especial interest in that, by being located in the new Hotel Statler, it will not only be in the very heart of Buffalo's extremely active center and therefore allow of the broadcasting of all of Buffalo's interesting activities, but it will make available to the radio listeners of the nation all the especially fine entertainment which the Hotel Statler will offer its guests.

Talking Automobile

Automobile row in Birmingham has a mystery. It is a talking Studebaker car. Crowds have been attracted by the novelty. Supposedly the owners have it hooked up with a radio set. But it is invisible and can't well be found on inspection. Still it talks, sings, tells all about the weather and gives the latest quotations in Standard Oil, preferred, etc.



International Newsreel

News from all Corners of the Earth



Raidio Aids in Capture

Little Verner "Dodo" Alexanderson, the six-year-old son of E. F. W. Alexanderson, chief engineer of the Radio Corporation of America, reported in last week's issue of "LISTENING-IN" Magazine as kidnapped from his home, was found unharmed in a cottage on the Indian River, near Theresa.

Verner had been lured from his yard by two men who promised the little fellow some "bunnies."

Descriptions of Verner and latest clues were broadcast continually from hundreds of stations throughout the United States. Radio owners were asked to flash immediate clues to station WGY, located at Schenectady, N. Y.

This incident only illustrates the great importance radio is to play in police circles in the very near future. Already it is filling an important part in locating hunted criminals.

Urges Limited Radius

Samuel Spitz, of Oakland, California, inventor of the new sea-depth-sounding apparatus and the new subway nickel tester, who is at the Hotel Pennsylvania, declares that the carrying quality of radio sets should be limited to a certain radius. Mr. Spitz is director of the Spitz Electrical Laboratories which have produced numerous unusual apparatus and inventions.

Waste Paper Over Radio

The use of radio for the dissemination of information about the collection of waste paper, and of its importance to the paper industry, is the latest step taken by the book, paper and board manufacturers of the country toward relieving the present shortage by informing the public that there is now an active market for this waste.

The editor of the Western trade journal gave a talk from a Chicago broadcasting station recently, and the same message, at the suggestion of the Michigan division of the American Paper Mill Superintendent's Association, was broadcast from several other stations in different parts of the country a few days later.

Directs Aeroplane from Ground

Radio enthusiasts living in the North Park section of Buffalo have had the novel experience of observing the directing of an air-craft from the broadcasting station of the Federal Telephone and Telegraph Company.

The plane, operated by L. L. Irvin, picked up signals from the station during its flight and Mr. Irvin enjoyed the music from the station.

Orders to "turn right," or "Turn left," were obeyed by the pilot to the surprise of the watchers on the ground.

We will be glad to receive articles of interest to radio fans.

To Broadcast Exercises

The June graduating class of the Palmer School of Chiropractic, of Davenport, Iowa, will have the unusual honor of being the first one from that school and probably the first one in the world whose commencement exercises will be broadcast. Arrangements have just been perfected whereby the commencement exercises of this class will be sent out to the listeners-in on Station WOC on Thursday evening, June 21, and radio fans will hear the program just the same as those sitting in the stadium that evening.



The exercises will be conducted in a large stadium located on the school premises, where the large class will be congregated and receive their diplomas. The special feature

of the evening is "The Spirit of the Crusaders," a commendable production symbolizing their interest in professional life.

Many unusual features have marked the advent of radio. The marriage ceremony has been performed at a distance of hundreds of miles the dead have been buried at sea and the services read by a chaplain aboard a distant vessel; weather forecasts and market quotations which are invaluable to all classes of people, are sent daily from coast to coast by means of radio broadcast stations.

Radio Speaker Entertains

David Cameron Clark, who is better known as the WHAM announcer, entertained at the home of Mr. and Mrs. Henry Kohlmetz, in Seneca Parkway, Rochester, recently with Miss Georgina Speare whose Bed Time Stories are also enjoyed nightly over the WHAM broadcasting station in the Eastman Theatre Building.

Free Music a Question

A question that was bound to arise sooner or later is that of payment for music. It was natural for companies manufacturing sets to offer, in free programs, inducements to buyers, but it is now asked if these companies can be reasonably expected to go on furnishing free entertainment.

Without doubt there will always be some free music broadcast by municipal bands, department store organizations and the like. This is on the side of mere transmission.

But what are they going to play?

If modern copyrighted music is used, royalties are justly demanded by its owners. Use of copyrighted music for profit, unless compensation is given, is an infringement which reputable companies will avoid.

This factor of royalties does not enter into the use of most of the classics. Yet the question does arise. Who is going to play these classics, and upon what terms?

It is obviously not to be expected that highly paid performers, whose fees often run into the thousands, will permit their concerts to be broadcast or that they will often be tempted into radio studios without getting well paid.

Two conditions will have to be met: The mechanics of reproduction must be greatly improved and the performers must be compensated. But the efficacy of the whole system will rest with Government control and the inventors of secrecy devices.

Church and Radio

That the broadcasting of religious services has increased church attendance, that radio has been a real help to the work of the church and has brought satisfaction and comfort to hundreds and thousands of people, is the opinion of the ministers of Schenectady who have been co-operating with M. P. Rice director of broadcasting of the General Electric Company in the transmission of church services.

Prohibition Debate Broadcast

"Should the Volstead Act be Repealed?" was the subject of a debate between Wayne B. Wheeler, representing the Anti-Saloon League and Colonel Ransom H. Gillett, General Counsel of the



Association Against Prohibition, recently staged before the microphone of Station WEAF.

It is estimated that half a million people heard the debate. Fifty-seven per cent of the radio audience believed that the Volstead Act should remain on the statute books and 43 per cent. wanted it repealed or modified.

Replies were received from Iowa, Georgia, Canada and all states between. Eighty people "listened in" at one New York receiving station. Seventy-eight of them voted wet and two for the dry side.

Fights Royalty Claims

Sixty radio broadcasters from 12 states organized the National Association of Broadcasters and prepared to fight to prove their right to broadcast copyright music.

The American Society of Composers, Authors and Publishers, controlling copyrights to many of the musical hits of the past decade, recently demanded that broadcasting stations pay a royalty for using the music. The Producing Managers' Association, which stages most of the musical shows requiring popular songs, protested against broadcasting the songs, royalty or no royalty, asserting they had purchased many of the songs and did not want them "worn out" before the shows were through with them.

Malicious Propaganda

Propaganda of various opposing interests is being spread daily. You are told that radio business is only in its infancy and that radical improvement will soon make the present machine obsolete. Let us see how much truth there is in this propaganda.

Do you realize that Armstrong's invention is the last radical improvement that has been made in radio and his patents were granted in 1914? In the eight years since it has only been a process of refinement.

Fifteen years ago you were told that the Talking Machine was crude yet how many improvements have been made in the talking machine in the last fifteen years.

If in 1906 an autoist said: "I am not going to drive an automobile until it is perfected," and waited until 1923, what improvements would he get—an electrical self-starter only and a few refinements. Think of the dollars of profit and the pleasure he would have lost in the meantime.

Radio in N. Y. Taxis



Several New York taxis are equipped with radio, not for the entertainment of the passengers, but for the driver of the cab. While waiting for a theatre to close last week

one taxi driver dropped a wire out of the car and attached it to a hydrant. Other drivers enjoyed the music picked out of the air. The hydrant furnished the necessary ground connection. Lamp posts are second choice as ground contacts. If some one calls for a taxi the ground is quickly reeled into the car and the concert ends.

Out of the Air

Listening over her radio, Mrs. W. W. Harding of Elizabeth, N. J., learns that she is the heir of \$25,000. Lawyers have been unable to locate her, so they asked a radio sending station to help.

The other night we picked up WWJ and heard the Detroit police broadcasting a description of a man, wearing a red mackinaw, wanted for murder.

He had fled from Windsor, Ontario, across the river from Detroit, a few hours previously. Many a farmer, hearing this, must have hunted up his shot-gun and began watching the road.

Radio eliminates distance. It makes the world smaller, especially for the fugitive.

First Radio Christening

Little Winifred Coker of Atlanta, Georgia, is the first infant on record to have utilized the wireless for christening ceremonies.

Mrs. J. B. Coker is her mother. The baby was named with full religious rites during baptismal services sent out from Atlanta broadcast station.

Kissing Over Radio

John Phillips, a coal miner, near Wilkesbarre, Pa., swore he "listened in" on a telephonic conversation between Mrs. Atha and Dr. Dias in which telephonic kisses often furnished most of the conversation.

Now we read about kissing via radio.

When modern Romeo living several miles away from Juliet wishes to express his love to her on odd nights he goes to his set and sends her an osculation via radio.

If he happens to leave town on a business trip in the year 1930, why there'll be, no doubt, special stations into which he can step and send to his fond sweetheart expressions of his devotion in the form of an electric kiss.

As to the kick received from such a kiss, why who'd want a kick greater than those given by electricity?

Which Side is Positive

The positive side of a battery is that from which current flows to the external circuit. Negative is the return circuit to the battery. This applies only in direct current.





Kudel & Herbert Photo
**Little "Buddy" Marshall Radio Bug.
 Prefers Radio to His Numerous
 Toys.**

"Buddy" Marshall is only three years old, but is a very promising radio fan, if we are to judge from this picture. This is the way his father found him when he came home one evening.

A Strange Truth

Words spoken in a public hall in Schenectady reached a radio listener in San Francisco, Cal., 2550 miles away, before they were heard by a listener 150 feet from the speaker.

That statement looks a bit fantastic but it is mathematically true. The apparent absurdity becomes reasonable when it is realized that the speed of sound is 1126 feet per second at a temperature of 68 degrees Fahrenheit and the speed of electrical vibrations or radio waves is 186,000 miles per second.

The listener in the back of the hall in Schenectady, 150 feet from the speaker heard the words in 0.1332 seconds.

San Francisco man heard words 0.1145 seconds sooner.

Because of the broadcasting of market news, radio has developed more rapidly in the Middle West, in the corn, wheat, and live stock growing regions, than in any other farm sections of the country.

Sunday Concerts Suspended

Announcement has been made by Station WOC, owned and operated by The Palmer School of Chiropractic, of Davenport, Iowa, that the Sunday afternoon concerts from 1:45 to 2:45 will be omitted from May 1st until the first Sunday in September.

During the summer months the great majority of "listeners in" will be away from home Sunday afternoons and will not have the opportunity to enjoy those concerts, and for that reason WOC has suspended this schedule.

All other schedules will be broadcast as usual during the summer.

The Radiophone is becoming a serious "menace" to the safety of the Swedish coast. The fishermen out at sea soon will be told from the Gothenberg Radio central the exact location of the herring schools, which will tend to eliminate wasteful waiting on the part of fishermen and doubtless mean a considerable increase in the catches of herring.



McGregor and His Radio

When the newsboy failed to deliver his morning paper the other day to Malcolm McGregor, actor in Metro pictures he decided to get news anyway. The photograph shows how he did it. McGregor says it was satisfactory enough, but he regretted that he couldn't hear what Mutt and Jeff said.

Amateurs' Round Table



Radio Reception During the Summer Months

By H. C. Siller

Many people believe that during the summer months their Radio sets should be packed in moth balls and put away with their woollens and furs until the coming winter. Could anything be more absurd? Radio fans of a year ago would say so.

Do not put away your set during the summer months for at this time some of the best reception is possible. With the many high-powered stations now broadcasting, radio is here to stay as an all-year-round affair and when the radio owners realize this, much pleasure will be theirs.

The radio fan of a year ago has found that he can use his set during the summer months with practically the same results as he had during the winter months. Summer static will be no worse than it has been on many nights during the past winter and unless there is a thunder storm in the immediate vicinity, you may use your set any time with good results. The old-fashioned bugbear of the thunder storm has long ago been dissipated, although every owner with an outside aerial should have a lightning arrester and a lightning switch installed. This will meet the requirements of the local Fire Underwriters and your Insurance Co. When you have installed them have your insurance company insert a clause in your policy permitting

same, which they will be glad to do.

Radio owners in Porto Rico, Cuba and South America use their sets the year around and weather conditions are never as good as in New York state, so why should you not enjoy your set as well.

Many people have believed that because sets were not used as much during the summer that radio reception was not possible. This they have found is not so which you will learn if you use your set freely during the months to come.

There are many uses for your radio during the summer. The baseball scores are a daily feature of the broadcasting programs in addition to the many other interesting features. For instance, band concerts in our parks, speeches of public men, services of different churches, to say nothing of the programs broadcast by the Rochester Radio Dealers' Club, thru station W H A M. With the many high powered radio stations now operating during the summer months, one can have continuous programs from one station or another every evening.

At the summer cottage or lakeside camp what would be more restful and entertaining than to sit and listen to good music.

With a two step amplifier added to any set, it will be possible to use a loud speaker and not have to use the head phones which some think too warm to wear during the warm weather. The present day loud speaker, reasonably priced, is within

the reach of almost anyone owning a radio set. With it one can enjoy dance music at the lakeside cottage, the mountains and in the camp.

There are many enjoyable evenings to be had, if you will tune in during the summer. Use your set as freely during the summer as you do in the winter. Don't "moth-ball" your set.

The crystal and dry-cell tube sets will play an important part in all our vacations this summer. The development of super-regenerative sets, reflex circuits, radio frequency and many other new and simple circuits, make it possible for the hiker, camper and those spending their vacations in out of the way places, to keep in touch with the outside world.

Many small cruisers are now equipped with radio sets and people owning canoes are substituting radio for the phonograph. The water is an ideal place for a radio outfit and much better reception is possible than on land. The development of the dry-tube cell make it possible for a set to be used for such purposes at a reasonable price.

Many things might be said of radio reception during the summer months and pleasure one may have if he only cares to tune in. Try it and convince yourself.

Again I say, don't "moth-ball your set" but save the moth-balls for your wollens and furs' or other things needing them.

Novel Set for Amateurs

Now the amateur can learn to operate his set by watching the parts in action. He can repair set by the same method.

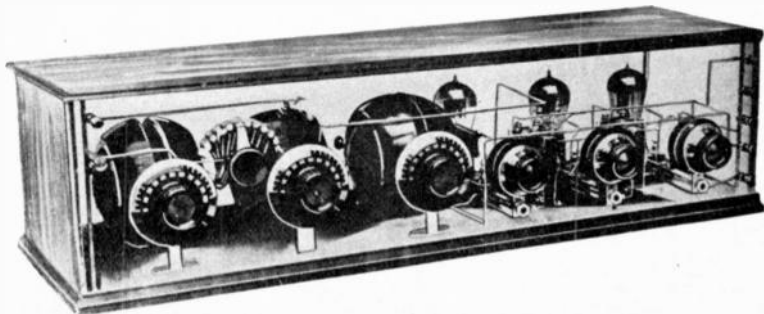
For the convenience of the amateur, the glass encased radio set has been put on the market. The works of the set are enclosed with glass panels instead of wood.

It is said that the glass panels eliminate body capacity, the bug-a-boo of the radio owner. Others disagree with this statement, but all agree that the glass paneled set is handy to work with.

All the parts of the set are visible to the amateur who can quickly learn the work of each part of his set in the functions of transmitting and receiving.

Neatness is a feature of the set, for the reason glass is readily cleaned by damp cloths and does not mar easily.

Locating trouble with the glass encased radio set is quite simple.



A Radio Set Enclosed in Glass

Radio in the Country



FARMERS, now a days, are as progressive as any one class of people you can name. They are strong for up-to-date methods of doing things, especially if they are running their farms on a business basis and making a successful living therefrom. They use tractors, trucks, gasoline engines, cream separators, milking machines and many other kinds of equipment and machinery required these days on an up-to-date farm to take the place of hand work and horses.

Radio in the country is appreciated by the farmer and his family both as an amusing hobby and as a practical source of information.

The farmer is miles away from the theaters and other places of amusement which the city man has nearby and, although he may have a car and slip into town and right back, after a hard day's work it is not particularly inviting to either he or his family.

Radio, bringing as it does the cream of the country's entertainment to the aerial of the phone listener, can be made into a very big factor in helping solve the problem of keeping the young folks on the farm contented and happy.

In the country, radio is an every day or evening proposition and not being surfeited with other forms of entertainment as is the city dweller, the farm folks have even much more to gain from the use of a radio receiving outfit than their city cousins.

Many of our metropolitan brothers

are not even remotely interested in what wheat and oats may be bringing in the respective markets but it is the farmer's bread and butter to know what his commodities are doing. Weather reports are of little practical value to the city man, who is not generally inconvenienced by rain or cold, however they are essential to the farmer to enable him to plan ahead, to protect his young trees from late frost and to do the hundred and one things that the average city man would never dream about.

The educational programs broadcasted from various stations are of tremendous value to the farmer and his family, because they are often denied the educational facilities with which city dwellers are blessed.

Radio works at least twenty-five per cent better out on the farm than it does in the city because there are no great masses of structural steel, no tremendous network of power lines and telephone and telegraph wires to absorb energy and create disturbances which cannot be controlled. Many people in the country who should have radio outfits offer three principal objections all of which are easily removed. We mention these objections below:

1. "I couldn't operate one of the daw-goned things!"
2. "They cost too much."
3. "What if it goes wrong or gets out of kilter?"

This objection is easily overcome. The modern single circuit set, with only one critical control, is easier by

far to operate than a Ford—and every farmer can run a “lizzie.”

The cost of a radio outfit which is sometimes offered as an objection need not prevent anyone in the country from enjoying the benefits of radio. Now a good crystal outfit will receive programs within a radius of about fifteen miles or if there is no broadcasting station in that territory the purchase of a tuner and detector and a few of the absolutely necessary parts will enable the farmer to get a simple but good outfit and he can add other parts later on as desired.

The third objection is easily overcome when one understands how simple and easy it is to operate a radio outfit. The modern radio set is not nearly as complicated as a gasoline engine.

Must be Americans

Announcement by J. G. Harbord, formerly major general in the American Expeditionary Forces and now president of the Radio Corporation of America, that all employees of the company must be American citizens and that those who do not want to be naturalized are at liberty to leave has made a profound impression here, where it is recognized as a significant sequel to the stories that have been afloat ever since the war that the British controlled the radio facilities of the world directly or indirectly.

There's an interesting tale behind these rumors. Congress passed its present laws taking the American navy out of the radio business and encouraging private capital to take over the stations built during the war largely in the belief that America's military and naval interests could be protected by insisting that the radio companies operating here must be American owned.

Originally the American Marconi Company was a British concern and when it was recognized under the name of the Radio Corporation of

America, it is true that the majority of the stock was held by American citizens; in fact the American Telephone and Telegraph Company and the General Electric Company together exercised the control, but it so happened that many of the officers of the company were English or Canadian. Many of the original Marconi employees were retained.

A Stunt from Painted Post

It might take the city fellers to sell gold bricks, but when it comes down to brass tacks the good old farmer ain't so slow after all, as proved by a novel scheme being worked at Paint Post by ingenious farmers.

According to our old friend, Walt Langworthy, SAYE, who recently installed several sets at Painted Post and started the idea, the owner of every third house has a vacuum tube set; the radio fans in between possessing inexpensive crystal sets.

As the vacuum tube sets have the Armstrong retransmitting circuit, which automatically transmits all calls and music received by it, the owners of the crystal sets can get the calls and music of the distant stations from the vacuum owners, just as though the stations were next door.

There is only one disadvantage to the clever stunt, says Walt, and that lies in the fact that crystal owners can not choose their own calls or music, but have to “listen in” to whatever program neighbors of the vacuum tube sets like—but this only illustrates further Emmer-son's Law on Compensation, eh?

So large was the Paragon set at the Third Annual Convention of the Second Radio District, held at the Hotel Pennsylvania, New York City, that Miss Rosalie Deveve, sat upon it when she “listened in.”

The set resembled a casket made for a giant of huge stature. It was black and eight feet in length.

Broadway— On the Farm

By James Edward Hungerford

The old place is changed, since the radio came,
 A bringin' us joy through the air;
 It's given us somethin' not easy to name—
 Like Heavenly blessin's to share;
 The old place was gloomy an' lonely before
 Pa went an' subscribed for a "set".
 An' now "dear ol' Broadway is right at our door—
 We're hittin' the "high-spots", you bet!

Whenever we're blue-like, we just "listen-in";
 Adjustin' that little ear-cap;
 An' first thing you know, we are wearin' a grin—
 A hearin' the good things on tap!
 The opery songs, an' the vaudyville jokes;
 The speeches those "air-speelers" spring;
 We're gettin' to feel like real "etified" folks—
 Just hearin' 'em yodle an' sing!

"Way down on the farm", where the busy bees buzz
 About in the clover all day,
 An' cacklin' chickens are raisin' a fuss,
 A-buildin' their nests in the hay,
 We clap the receiving set onto our ears,
 An'—presto! the farm is forgot!
 One minute we're laughin'—the next we're in tears,
 Or gettin' "wised-up" a whole lot!

Yep, things have sure changed, since the radio came,
 A-bringin' its music an' joy;
 Ma acts like a girl, an' ol' gran-pappy, lame,
 Is no longer old—he's a boy!
 Pa dances an' jigs to the jazz that he hears,
 An' me? Well, I'm willin' to stay
 Right here on the farm, with those songs in my ears—
 They're singin' "on dear ol' Broadway"!

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Radio in Bath Tub



Radio, a Bath Tub, and Hawaiian Music Transports Pretty Miss Estelle Keanton, to Honolulu.

WHY spend a small fortune for the pleasure of loitering round the sandy shores of Honolulu or the bathing beaches at Havana, when with a bath tub, a radio, and plenty of suggestion, one can enjoy the same pleasures in one's own little apartment?

Pretty Miss Estelle Keanton, even though she is no advocate of Coucism or Christian Science, can imagine herself upon the hot sands of Havana "listening in" to the wild sea waves.

This is how she does it.

Miss Keanton, an attractive brunette, gets her bathing water lukewarm, like the cooling waters at Havana or the coral seas washing upon the shores of Honolulu. Then with her dainty cigarette and the 'phones of her Apex set over her ears, she tunes in on Havana or Honolulu and closes her eyes and dreams.

The enhancing voices of Gallagher and Shean save her from a ducking,

preventing her from falling asleep. And the strumming of Hawaiian orchestra transports her, body and soul, to the land of the Honolulu dancer.

Radio Battling Cable Companies

If radio companies make further cuts, the cable companies will be confronted with the necessity of meeting the cut, or permitting a still greater volume of traffic to go to the radio companies. Cables between the United States and Europe at the present time are working at less than sixty per cent capacity, officials estimate.

With the radio companies constantly making headway in the campaign for business and with the future clouded with uncertainty because of the rate war, cable companies are hesitating to go on with their construction campaign, previously determined upon at least tentatively.

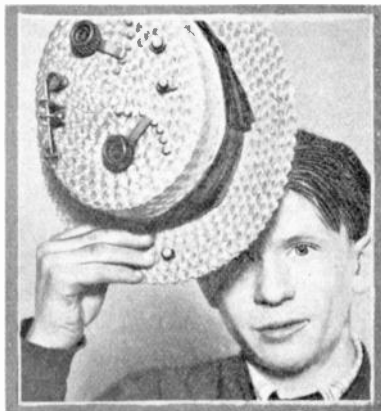
Carries Set in Straw

"How do you do", says Nathan Fleishman, a 15 year old Philadelphia lad, as he tips his hat and at the same time displays his unique new radio set. The whole receiving set is contained in the straw kelly and with this, an umbrella for an aerial, and a piece of wire trailing along behind him for a ground, he strolls about the Quaker City, getting all the concerts by local and suburban broadcasting stations wherever he goes.

The set cost him 40 cents and the coil, which consists of about 200 turns, tapped at every eleventh turn is hidden by the hatband.

There are eight turns on the primary and eight on the secondary of the coil. The leads from the taps are brought through the hat and connected to the switchpoints on top that are controlled by two switch blades for tuning purposes.

Of the four binding posts, two are used for phone connectors and two for the aerial and ground wires.



Underwood & Underwood Photo

The crystal detector was purchased for ten cents in a nickel-dime store.

Fleishman has only been in this country for two years, having come from Poland. He is in the seventh grade at school and has frequent talks on radio to his schoolmates.

Receiver by Phonograph

Placing the radio receiver in a phonograph cabinet is the novel stunt of G. E. Hampton of 921 Woodburn St. By this arrangement Mr. Hampton can have radio or phonograph music as he desires and at a minimum of effort.

The receiver is placed in the cabinet just under the victrola part or near the first shelves. Obviously, arranging the set as this one is done necessitates some extra work as the shelves in the cabinet must be removed and extra fittings put in to support the receiver.

The receiver is made so that it slides in and out of the cabinet and when not in use shutting the doors hides it from view. Mr. Hampton's set consists of the following apparatus:

Vario-coupler, 43 plate variable condenser with a five plate Vernier attachment, three rheostats, three audio frequency transformers, four

sockets, four vacuum tubes, one anti-capacity switch, one A- Battery cut-out switch, four 10-point tap switches, two telephone jacks, three 22½ volt B-batteries, one Baldwin phone with Westinghouse Victrola attachment.

The apparatus is mounted on a wood base of suitable dimensions to enter the phonograph with a bakelite panel attached to the base.

While Mr. Hampton hears radio concerts all over the country he states that the concerts broadcasted from KDKA, the Westinghouse Electric & Manufacturing Company's pioneer station please him best of any he has yet heard.

A. N. Bloom, writing from Pine Bluff, Ark., "The Capital of the Garden Spot of the World," says:

"Your concert is like the bottom of a stove—grate."

Making Music Clearer

One of the principal troubles of radio broadcasting is overcome by this new "glowing discharge" microphone, which eliminates the mechanical diaphragm and a stream of electric energy between the two terminals is substituted for it.

Since this stream possesses no perceptible inertia and has no vibration period of its own, it will transmit perfectly all sounds reaching it. By using this transmitter, therefore, broadcasted music is sent out with all its original purity and without distortion.

This new invention is the work of Dr. Phillips Thomas, research engineer for the Westinghouse Electric & Mfg. Co. This microphone has been in use by the broadcasting station KDKA for the past several months, which explains the unusual clarity of this station's voice. It will soon be installed in all the other Westinghouse stations.

Photo shows D. Phillips Thomas' newest invention in "Radio-glowing discharge" microphone.



Kadel & Herbert Photo

Reducing the Whistle

Every radio receiving station consists of an antenna of some description connected to some type of re-

ceiving apparatus. The antenna intercepts and absorbs from the passing magnetic waves a certain amount of energy. This amount will vary with the type of receiver used, the operation of receiver, the size of the antenna and over all the efficiency of the receiving set.

Listeners employing crystal sets can do a great deal of good for other listeners by detuning their sets when they are in use. It is not necessary to disturb the adjustment of the crystal to do this. Merely turn your tune dial or knob, or place your tuning coil sliders to either end of their scales and your set will not absorb the energy that other "listeners in" wish to pick up.

Most regenerative receivers become miniature transmitters when the regeneration control is placed at a point where the receiver will oscillate. Waves radiated from a station using a receiver in this way can be picked up several blocks away by other regenerative sets.

Every radiophan has heard the faint whistles and squeals moving over the scales of their sets, spoiling the reception of distant concerts. These whistles are caused by thoughtless fans receiving signals while their sets oscillate. These listeners find the station with their detector tube oscillating and then, by careful adjustment, lower the "beat note" to zero.

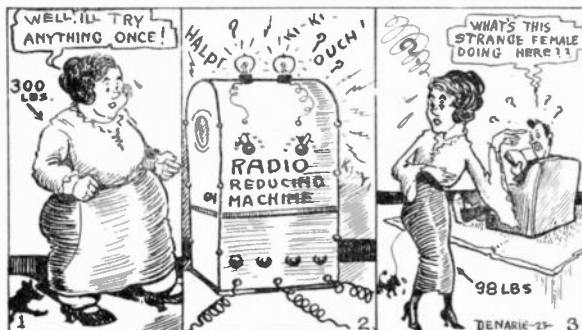
By keeping the receiver at this central adjustment it is possible to receive signals with the detector tube oscillating. Since the slightest change in either the transmitting station's wave length or the receiving station's antenna or adjustments will cause a growl or squeal, this method is to be discouraged as most impolite and unsportsmanlike.

Elman B. Myers of the Radio Audion Company, who is establishing new factory headquarters at Montreal, Canada, announces the discovery of a filament which will be used in a tube for radio purposes that will be guaranteed for five years.

New Tube Has 9 Lives

A vacuum tube, which consumes 70 per cent less current than any of the small or so-called peanut variety now being sold; and the first to operate with the filament current supplied from the ordinary flashlight battery, has been perfected by the General Electric Company. It will be known as the UV-199.

This new type tube has a tungsten filament, which is considered as



great advance over the old filament for vacuum tubes in radio work as the tungsten incandescent lamp is over the carbon lamp in the field of electrical illumination.

The filament wire in the new tube is extremely small. However, this is not an indication of any weakness for this tungsten wire has the strength of the best steel piano wire.

This tube might almost be termed "the tube with nine lives" because if the filament is operated at too high a temperature the electron emission falls off and the tube becomes inoperative.

The UV-199 should be mounted in a vertical position. When operated as a detector the maximum plate voltage should not exceed forty volts. Critical adjustment of the plate voltage is not required. When used as an amplifier it is important that the filament rheostat be connected in the negative fila-

Continued on page 50

Another Radio Bath

A radio wave bath which looks like the hood of a snappy white motor car with nickeled trimmings, and which its inventors claim will reduce obesity, stimulate metabolism and benefit sufferers from pneumonia neuritis and rheumatism, was exhibited recently at the New York Edison Electrical Show. Dr. William S. Benson and Frank B. Shanne developed the machine.

One end of the bath is open to admit a sliding cot on which the patient lies while he is bathed in electro-magnetic waves.

"The patient at no times comes in contact with a primary current, said J. V. Cark, spokesman for Doctors William S. Benson and Frank B. Shanne, who developed the machine. It has been tested for more than three years and more than a thousand patients have been treated with satisfactory results."

Among the most important uses of the apparatus, says its inventors, is the treatment of heart troubles. The electro-magnetic waves can be tuned down to the weakest human heart beat, thus eliminating the danger of overpowering shocks.

They can be speeded up to the point where the mere introduction of an electric light bulb into the apparatus will cause the bulb to glow. Inside the hood is a carnival of electric lights, all the colors of the rainbow occasionally flashing at the patient as he takes his electric bath. The baths can be taken fully clothed as the electro-magnetic waves go right through the clothing.

Discovery that the treatment would aid fat persons to reduce was made accidentally. An obese woman

Continued on page 50

Heard Over Our Radio

In Which our Office Force Gets Radio Razzed

Andy the cartoonist who draws Wireless Willie, got the writer's cramps the other day and while resting his fingers he tuned in on a dry humorist, one of whose jokes was:

"A friend of mine read in the paper that I had died. I, too, had read the error and phoned to my friend and asked:

"Say, Burke, did you read about my death?"

"Yes," replied Burke, "Where are you wiring from?"

A few snickers were heard from the "stenog" and the typist.

Soon the humorist cracked another wise one. He said:

"Mrs. Flannigan took her children into a photograph studio to have their pictures taken. Upon inquiring the cost of pictures the photographer said to her:

"They's cost, madam, ten dollars a dozen!"

"Mrs. Flannigan then counted her children and finding she had only eleven, she said:

"Sure then, but I'll have to come back again! Oi've only eleven!"

Needless to say Andy ended that humorist's "line" with scratches and shrieks. The Boss eyed him severely. Andy forgot his cramps and resumed his illustrating.

And then the Boss decided to "listen in." After prowling around the air for a time, he finally settled upon an announcer speaking on poultry. This is what we heard:

"Poultry experts of the world have announced that hens of the country are all set for a big season.

Only the other day as I was wandering aimlessly about my farm, I saw a chicken peering around a corner of the barn. Now as I know chickens thoroughly—I've made a special study of chickens, that is, poultry—I'm sure I heard that evil-looking chicken remark to her friend:

"That's the guy I'm laying for!.. And from——"

But just then Director Schilling came into the office. Director Schilling is also an expert on chickens with feathers.

Our business manager is married. She has a fine little boy, Frankie, who came into the office the other day and said:

"Mama, do you know what I am going to give you for Christmas when it comes again?"

"No," said his mother smilingly; "but I should like to."

"Want a fine dressing-table tray with flowers painted on it," said the child.

"But, Frankie," was the reply, you know I have a nice tray of that sort already."

"No, you haven't mother," said Frankie, "I've just dropped it on the floor."

A few snickers were heard from the region inhabited by our "stenogs."

An Expensive Outfit

Mr. Aloysius Sissenschwистер, Mulberry Bend, N. Y. C., asks:

Question—I want to make an eight-tube receiving set, but have no money to buy any of the parts. How can I secure them?

Answer—Inquire at Registry Department, N. Y. C. Postoffice.

Answer—Study prestidigitation.

Answer—Sing just once like Martinelli. He gets \$30,000 a performance we are told. This amount would give you a good start toward the set you mention. R. N.

Duty on Tubes in Ireland

Vacuum tubes are included among the articles on which the Irish Free State has just decided to impose an ad valorem duty of 33 1-3 per cent if imported into southern Ireland. The regulation went into effect as from April 1.

Radio In Mines

Miners trapped hundreds of feet below the surface of the earth will be able to communicate with their rescuers, to advise them regarding their location, and to be cheered by friends, according to wireless experiments just completed in the United States and in England.

Tests conducted at the experimental coal mine of the Bureau of Mines at Bruceton, Pa., hold out hope that wireless waves may be used in the future as a means of effective communication between rescuers on the surface and entombed miners.

While failing to develop any practical method of using wireless waves for underground communication, nevertheless the tests there indicate clearly that electromagnetic waves may be made to travel through solid strata.

In the Bruceton experiments, signals were heard distinctly through 50 feet of coal strata, although the inaudibility of intensity with distance is very great for the short wave-lengths used.

Experiments in England were conducted by the Sheffield Wireless Society at the Blue Johns Mine, which is, in reality, a huge natural cave. An aerial of a single strand of

copper wire was suspended in the cave 280 feet below ground level and $2\frac{1}{4}$ miles from the broadcasting station.

Audible messages were transmitted and received at both ends. An ordinary spark transmitter was used in the cave, while a short wave tuner with a reaction coil and a three-stage detector amplifier were used for reception.

In all experiments vertical antennae were used; horizontal antennae gave no results. It is believed this is due to the fact that the strata of the mine lies horizontally, influencing radio waves.

There is a certain code of action in every sport, one that is intended to permit the greatest number to enjoy that sport. In the theater hats are removed. The person who stands in his seat at a ball game is soon requested with "down in front," and if he does not "down" he is apt to be downed. Persons who are noisy during a symphony concert are asked to leave. If you think the matter over for a moment you will appreciate that corresponding features exist in radio broadcast reception and that "listening in" must be played as a gentlemen's game.



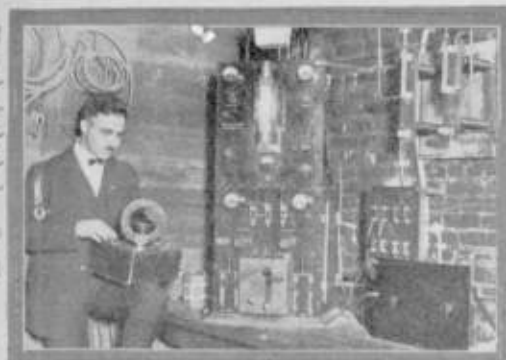
RADIO · WEEKLY · EVENTS



The exact amount of material that goes into one transformer. On the left are the Silicon steel laminations. Then the primary & secondary coil, the frame, screws, bolts and completed transformer. Miss Gertrude Jirachien, posed for the photographer.



Winding the primary and secondary coil. The wire used for this purpose is #40 enameled. It is smaller than the width of a human hair.



E. H. Lee, US Radio Inspector, testing New Station, WSAP for wave length. This station is the latest church to adopt radio as a religious aid, in New York City.



Above shows Miss Gay Garrity soldering the leads of an audio frequency transformer.



Assembling an audio frequency transformer. Miss Francis Miller has broken all records for speed in assembling transformers.



Louise Wilson, Paramount Star, Listening In.



Testing transformers. A radio set and loop aerial are used. They are then placed on a little frame and connected to a receiving set.



How many of you Radio Fans have heard the station CIG Havana, Cuba. CIG is the most powerful and modern station on the island.

WGY Orchestra, Studio of the General Electric Co. broadcasting station at Schenectady, NY.



It's B.G. Field Broadcasting and Receiving Station of the 101st Signal Battalion, N.Y.C. It is located at Herald Square, 34th St and Broadway New York City.

Uses Human Body as Aerial



Kadel & Herbert Photo

An interesting radio experiment may be tried by anyone who possesses a radio receiving set, is shown in the accompanying photo, by wrapping several turns of wire around Helen V. Plunkett, and using her as an aerial and William Hennessey was able to hear concerts, almost as loud as with a regular outside aerial.

Radio Movies

The latest of several means devised for transmitting pictures by radio is the invention of C. Francis Jenkins, who, not satisfied with this accomplishment, is working on an invention to transmit moving pictures by radio.

The method of sending pictures by radio consists in cutting a photograph into hundreds of small pieces and in moving the projected image of each piece across a photo-electric cell, thus impressing the picture point by point on the cell. The cell converts light variations into electrical variations which are amplified and transmitted from an antenna. The process is reversed at the receiving end.

Radio Controlled Airplanes

Radio controls an airplane in a six-hour flight. Not a soul on board, but yet the ether waves from the ground turned the trick. Does this seemingly unimportant news dispatch from France have any meaning to you?

Major General Patrick, chief of the U. S. Air Forces, recently stated that Radio controlled planes would be common in this country before long. That being the case, the lives of many U. S. Military Pilots will be lengthened considerably.

Nowadays, eight years is about the maximum life of our military fliers. They are often maimed for life long before the eight years are up. Radio will prolong the lives of the pilots and make military aviation a more attractive career for youths looking forward to imitating Methuselah.

Radio Fan Lectures Bear



World-Wide Photo

A tiny radio fan in England lectures his slumbering companion after hearing "Little Red Riding Hood" over his set before retiring. The youngster is going to make sure that his young Teddy never commits any such outrage as the bear in the old fairy tale.

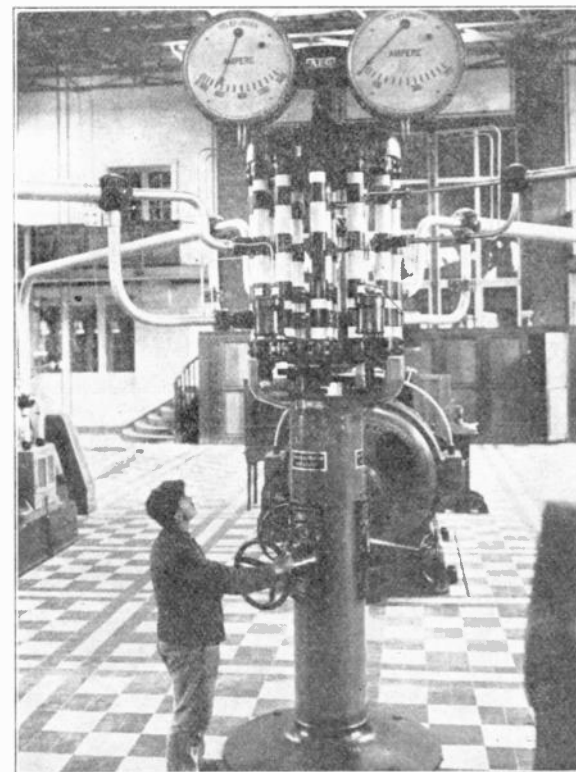
Every issue of this magazine will be better than its predecessor. "LISTENING IN" is far from being perfect, but our constant efforts will be devoted to improving it.

Foreign Radio Facts

In compliance with a number of requests the following information is supplied by the Department of Commerce for the benefit of all concerned: Nauen, Germany, call letters, POZ, range 6,500 miles; w. l., 3100, 4900, 5600, 6300, 8700, 9800, 13000. Kootwijk, Sambeek, Holland

call letters, PCG; range, 5000-6000 miles; w. l., 6250, 8400, 12500, 16800. Stavanger Norway, call letters, LCM, w. l., 12,100. Bordeaux-Lafayette, France, call letters, LY; power 500 KW arc. Lyons, France, call letters YN; power, 60-200 KW. Eiffel Tower, France, call letters FL; power, 40 KW. Basse Lande (Nantes), call letters, UA; power, 200 KW.

Germany's New Station



International Newsreel

Berlin's Radio Station

From Neuen, German, to Riverhead, Long Island, in the wonderful time of 1-20th of a second—such is the record of the radio station near Berlin. The photographs are the first ever made of the interior of the great station.

Photo shows one of the giant radio appliances.

See photo of monster coils on page 56.

Subscribe for "LISTENING IN" \$2.00 per year.

Hall Balconies Removed

A drastic step in squealing campus "Romeos" who serenade co-eds with guitars was taken in North-western University. The balconies of Willard Hall, the largest co-ed dormitory, were removed.

Being a college graduate himself, the editor of "LISTENING-IN" Magazine sympathizes sincerely with the poor inmates of that college and all others advocating a no "Romeo love balcony."

Conspiring with the technical advisor and with the aid of the art editor, he has suggested that the idea in the illustration below be used by arduous lovers to "out-smart" priggish school ma'ams.

?

Will there be a scramble of all radio interests to get in on the once supposedly worthless ether band below 150 meters length?

The onward march of radio transmission has undergone so many changes within a period of mere months that even the most expert hesitate to express an opinion for fear of being called upon to retract. This has been true of most all predictions about the value of short waves.

Radio Saves Life

First and last, the role for which radio is preeminently fitted is that of saving life at sea. The freighter *Montello* met with such terrific storms on her trip out from Philadelphia on her way to Marseilles that in mid-ocean it became necessary to abandon her. An SOS call, giving the location of the sinking vessel, was picked up by the Italian liner *Giuseppe Verdi* and in half a day she had located the sinking ship and started the rescue work. Ultimately, she was able to save the entire crew. The life boats of the *Montello* had been smashed by the mountainous seas and it seems certain that all on board would have been lost, had it not been for radio.

Martin P. Rice, manager of publicity for the General Electric Co. has been investigating the possibility of installing a 1,000-watt broadcasting station at San Francisco or in the vicinity. This station is to be similar to the G. E. Station at Schenectady and will constitute one of the nine stations to be operated by the Radio Corporation, the Westinghouse Company and the General Electric Company.



\$1.00**\$1.00****\$1.00**

One Dollar is the Cost of the New
Triumph Crystal Receiving Set

GUARANTEED to receive as clearly as
 any crystal set made!

This wonderful set enclosed over all in a neat and
 attractive leather case.

A timely and valuable article for merchants to
 give as premiums. We place your imprint on the
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 matter and other advertising suggestions are fur-
 nished by this department to old and new and
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This service enables our patrons of the advertis-
 ing columns to reach readers by a route of sure
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Trouble Finders

Operating Regenerative Sets

Users of regenerative radio receiving sets should be very careful in regulating the filament current on the detector tubes of their receiving outfits.

A regenerative receiver acts as a miniature transmitting station and a great deal of troublesome and needless interference can be created in a neighborhood by a user of this type of receiver who is not acquainted with the facts regarding their operation.

The wailing, howling noise sometimes heard on a receiving set is, in many instances, due to the users of a **regenerative set** tuning their dials in an effort to tune in a broadcast station.

Much of this interference can be eliminated by burning the filament on the detector tube at a minimum brilliancy necessary to receive the desired signals. Users of this type of equipment, after tuning in their station, should reduce the filament current as much as possible. By observing this rule they will not only prolong the life of their tubes and batteries, but will make receiving conditions much better for their neighbors who may be trying to tune in at the same time.

The amount of energy radiated by a regenerative receiver is directly proportionate to the brilliancy of the filament in the detector circuit.

—B. W. S.

Solder the Joints

Any aerial, more especially the outside ones, should have the joints soldered, or in the event that this cannot be done the wires should be scraped bright, twisted securely together and wrapped tightly with tin or lead foil at the joint. Cover the tinfoil with friction tape in such a way as to keep the water from entering the joint. By this method the wires are kept from corrosion caused by the elements, and if properly done this is as good as a soldered joint.

The ground connection should be of No. 14 copper wire, preferably covered. Connection should be made to the nearest waterpipe, always bearing in mind that a long path to the earth is to be avoided. A wire from the front of the house to the pipe in the rear is not as good as a wire from a set down the side of the house to a pipe near the water meter.

We could have made a big splurge on the first issue of "LISTENING IN"—and then "weakened" on the subsequent issues. However, we preferred to get out as good an initial number as possible and improve its contents with each appearance. To prove that we are accomplishing this, we ask you to compare this number with our first issue of May 5th. Our third appearance will be still better. Watch us grow.

Scenic Highway Described

As part of its work disseminating information about National Parks and other places of interest in the United States, the next number on the program of Station WOC, owned and operated by the Palmer School of Chiropractic, at Davenport, Iowa, will be a lecture describing the "Custer Battlefield Highway," Omaha, Nebraska, to the Glacier National Park, in Montana. The lecture will be given on Monday evening, May 14th, and will be delivered by W. D. Fisher.

Among the many places of scenic or historic interest along this highway may be mentioned the scenic Bad Lands of South Dakota; the Black Hills and Harney National Forests; Wind Cave; Home Stake Gold Mine; Roosevelt Monument at Deadwood, South Dakota; Custer State Park, the largest State Park in the United States; the famous Sundance Mountains; the Devil's Tower; Big Horn National Forests; Custer Battlefield, Yellowstone Park; Beartooth National Forests; Jefferson National Forests; Lewis and Clark National Forests; Blackfeet Indian Reservation and Glacier National Park.

The Highway is nearly 1,475 miles in length, it is claimed that it has no sand or heavy mountain grades, and the almost extinct longhorns and cowboys of the old West may still be seen along this interesting highway. This lecture will interest the "listeners'in" particularly from the standpoint of the historic value which it will contain, and will be very pleasing to those "listeners-in" who have heard the series of lectures which have been broadcast by Station WOC relating to the National Parks.

To radio amateurs, Baltimore is known as the deadeast spot in the country. Its broadcasting stations are not even heard in Westminster, which is less than 25 miles away.

Amazing Radio Growth

The marvelous increase in the use of radio in the United States was strikingly revealed in a recent announcement from the Federal Bureau of Navigations that the number of broadcasting stations jumped from three in October, 1921 to 564 in November 1922. Amateur stations during the same period increased from 11,000 to 16,465. Receiving stations throughout the country are numbered at 1,000,000.

The distribution of special amateur licenses by districts, is as follows:

| District | Headquarters | Total | M | st |
|----------|---------------|-------|---|----|
| 1 | Boston | 2,490 | | |
| 2 | New York | 2,589 | | |
| 3 | Baltimore | 1,919 | | |
| 4 | Norfolk | 420 | | |
| 5 | New Orleans | 825 | | |
| 6 | San Francisco | 2,019 | | |
| 7 | Seattle | 863 | | |
| 8 | Detroit | 2,749 | | |
| 9 | Chicago | 3,729 | | |

Total Special Amateurs 17,703

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Specialist on Reflex and
Radio Frequency Circuit

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Have us design a portable set for your summer trip.

— FREE —

Copies of the ERLA
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The most powerful one tube circuit ever built.

J. Lawrence Hill Co.

2 Plymouth Avenue, S.
Rochester, N. Y.

Stops Copyright Music

The Westinghouse Electric and Manufacturing Company, operating four of the largest broadcasting stations in the world, KDKA, the pioneer, at East Pittsburgh, Pa.; KYW, at Chicago; WBZ, at Springfield, Mass., and WJZ, at Newark, co-operating with the Radio Corporation of America, recently made the following statement in regard to the activities of the Society of Authors and Composers in the radio telephone field:

"An organization representing a considerable number of the authors and publishers of copyrighted music has notified us that the purchase of their sheet music does not carry with it any right to a public performance thereof for profit. Although this station gives free performances and makes no charge of any kind to the vocal and instrumental artists

who participate in its programs, they claim they are, nevertheless, conducting a performance for profit and therefore have no right to use their copyrighted music without permission. It has been and will continue to be—our constant endeavor, to furnish the public without charge the best program that we can devise but the conditions under which permission to broadcast the copyrighted music of this organization would involve a considerable addition to the already very heavy burden of expense under which we are operating. These conditions are further fraught with possible future complications which might readily become so embarrassing as to interfere with the continued successful operation of this station, so that after the most careful study of the subject from all points of view, we have decided to eliminate from our future programs all copyrighted music."

RADIO SUPPLIES AND SERVICE

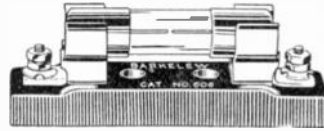
Quality Apparatus for the Best Results

If you want to build an outfit let us show you how.

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Lightning Arresters

Barkelew are the best
New Model, Gap only 2.00
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are giving good service
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Member of Radio Dealers' Club

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Main 6352

Opposite Security Trust Co.

The Question Box

We will be pleased to give all the information and assistance possible thru this department. If you are having difficulty with your outfit, kindly send the wiring diagram or sketch of your



circuit when possible, as it greatly assists us in locating trouble. Also give size of condensers and number of turns of wire in the co's. Address—

The Question Box Editor

WD-11 TUBE

What is the proper sized grid leak and grid condenser for the Westinghouse "WD-11" tube? Does the negative wire from the "A" Battery go to the rheostat?—J.H.B.

Answer—A grid condenser of .00025 mfd. is correct. The grid leak should be about 3 megohms or a little less. Different tubes require different grid leaks to get the best results.

Yes, to have the negative wire from the "A" Battery to the rheostat is the best arrangement, and connect the grid return wire on to the positive lead going direct to the filament.

RADIOTRON UV 201-A

Question—How does the new tube UV-201-A compare with the former tube UV-201? Does this tube operate satisfactorily with a standard rheostat? N. V. C., Buffalo.

Answer—This new tube requires only one-fourth of an ampere and five volts on the filament. It gives clearer amplification over a wide range of tune frequencies and will carry a high voltage better when used as a power amplifier. The use of a negative grid potential is often necessary with this tube to get the best results. This tube gives very good results as an amplifier when used with a common rheostat which should be turned on about one third the way.

ON THE WR-21 TUBE

Question—I have a Westinghouse

WR-21 1 $\frac{1}{2}$ volt tube set, but it does not seem to work. I have a WD-11 which I took out and inserted this new tube in its socket. It lights but does not work. The WD-11 works. I am sure I had the right prongs in the right holes and am sure they made contact.—E. D.

Answer—With regard to the Westinghouse WR-21 tube: This is the tube which was originally designed for the Aeriola Grand. It was withdrawn from the market by the Westinghouse company as being unsatisfactory. How it got back on the market again, I could not say. It is not a dry cell tube, but a storage battery tube.

AERIAL OUTSIDE

Question—I have an aerial, three wires 45 feet long, in our attic. Would it be better outside? How long should it be?—A. E. B.

Answer—If you can stretch one wire about 100 feet long as high as your aerial in the attic and at least three feet over trees, if near them, you would probably have better results. An outside aerial requires an approved lightning protector to satisfy your insurance company.

A CR-9 SET

Question—I have just tried out my CR-9 set at Blue Point, L. I., and find considerable interference at times from two distant sparks. One of these, I presume is at Sayville, five miles away, and the other at Rocky Point, fifteen miles away. Is there any way I can cut out or

minimize these sparks? If a wave trap will help will you be kind enough to tell me just how to construct it—that is, circuit, size of wire, etc.—A. L. M.

Answer—The probability is that the interference you are experiencing at Blue Point is due to the harmonics from the two big trans-Atlantic stations. What I would suggest is that you employ a wave trap, consisting of a duo-lateral coil, with a twenty-three plate condenser shunted across it. This trap will be connected into your aerial circuit, the aerial going to one side of the coil, and the lead from the other side of the coil to the aerial terminal of your (R 9. The trap will be tuned to the interfering station, and then your receiver tuned to the broadcasting station in the ordinary way. I would suggest that you experiment with fifty, seventy-five and 100-turn coils.

FIELD FEED WITH R. F.

Question—Am enclosing an schematic drawing of my regenerative hook-up. I should like to add one stage of radio and still retain the feed-back to the plate.—P. C. M.

Answer—Radio-frequency amplifier is in itself regeneration. I doubt very much whether you will be able to get any additional value out of the feed-back coil when you add one stage of radio-frequency to the circuit.

GROUND CONNECTION

Question—I've been told that adding an extra ground wire to a crystal set makes it possible to hear more distinctly. Is that true? If so, why?—C. E. R., Batavia, N. Y.

Answer—One ground wire securely fastened to a water pipe which runs many feet under the ground in our city is very satisfactory and probably could not be improved. One ground wire to a radiator generally works well but not equal to the water pipe. Connecting to both would be of little value except for transmitting stations.

CRYSTAL OUTFIT

Question—Is there some sort of an attachment that can be used with a crystal set which will enable one to hear out of town or is it a "freak" set which sometimes picks up outside stations?—H. H. B., Rochester, N. Y.

Answer—There is no particular attachment which enables one to hear out of town with a crystal outfit. With a crystal outfit in excellent condition one often hears music very faintly from WGR or KDKA, but when it is heard loud it must be a freak condition. It is recently explained that a strong tube set receiving music from a distance can re-radiate or reflect this music to a crystal outfit near.

BUZZING

Question—If three or four headpieces are attached to one crystal set, will it be less distinct than with only one attached? Can more than one set be attached to one aerial? What causes the disconnected buzzing or vibration which I sometimes hear over my crystal set? (I am not referring to the distinct code which I occasionally hear.)—E. R. B., Scottsville.

Answer—Yes, each headset uses part of the signal strength. It is not practical to hear broadcasting by two sets on one aerial. Buzzing in a radio set which is not code messages is induction from the electric wires in the house, generally a steady hum. It is probably grounding trouble or the electric power lines in your section of the city.

Radio Heats Water Bottle

Something brand new in the line of domestic comfort is now on the threshold of appearing on the market. Built along the scheme of the electric bottle, it will derive its power from wireless waves, which will heat it to the proper temperature as soon as you press a button.

No, we are not yet as big as we will be when we "grow up"—but, watch us grow!

Ether Vibrates with Words

Little do people realize that the air is continually vibrating with words traveling along through the homes of all at the speed of 186,000 miles a second.

The naval communications service transmitted about 4,500,000 words the first quarter of the fiscal year 1923.

The navy's part of this number was 3,000,000. The next largest user was the Department of Agriculture with nearly 500,000 words.

One of the latest discoveries is a for-element vacuum tube for radio receiving which operates from an ordinary light socket without requiring either "A" or "B" batteries.

Important points on the borders of the United States, Canada and Mexico are now linked with radio communication.

Life boats on the Leviathan, America's greatest passenger liner, are being equipped with radio apparatus. The sets are as powerful as those on the average cargo carriers.

What Do You Need For Your Home Workshop?

Home workers who must buy special parts, materials, or tools, will usually save themselves time and trouble by looking up the display and classified advertising in this issue of "Listening In."

If items desired are not listed in the advertisements, send a letter of inquiry to the Information Department, inclosing a stamped self-addressed envelope. You can depend upon a prompt reply to your communication.

Battery Connections

When connecting to other radio units, troubles may be avoided by connecting the wires to the battery last and then just touch the last wire before making permanent connection. There is always a possibility of having wrong connections.

Radio Supplies

Our Line of Radio Sets and Parts is most complete. Your inspection is invited.

Now is the time to install that Lightning Arrester and Switch.

"ARGUS" **\$1.50**
Lightning Arrester

"TRUMBULL" **\$2.65**
Lightning Switch

Let us demonstrate

**Warder, Clark & Chaplin
Electric Co., Inc.**

**362 East Main Street
Rochester, N. Y.**

Member Radio Dealers' Club
Main 1283

Mr.

If

Your Announcement was in this space thousands would see and read it.

If interested write or phone for particulars. You incur no obligation.

Will W. Zimmer, Inc.

Publishers "LISTENING IN"

47 North Clinton Avenue

Rochester, N. Y.

Phone, Stone 5798



Remember This About Advertising

Concerns, now-a-days, do not grow big before they begin to advertise. They have to begin to use advertising and then grow great. This advertising of course, must be backed by merchandise of good quality and sold at a fair price on a basis of satisfaction and service to the customer.

Honest advertising intelligently and persistently used will establish better relations between the manufacturer, the merchant and the public.

The publishers of "LISTENING IN" Magazine believe in advertising and practice what they preach!

We used large display advertising space in all the Rochester Sunday and daily newspapers and in Western New York papers, for two weeks before the appearance of the first number of our publication with the result that on Saturday, May 5th, many of the news stands in this part of the state sold more copies of "LISTENING IN" Radio Illustrated Magazine in one day than they sold of the other well established radio periodicals in a week!

We intend to keep on advertising in order to inform the general public about our magazine and to back up this publicity with a periodical full of helpful, interesting matter and attractive illustrations.

Millions of Americans are nightly plucking a whole evening's entertainment out of the very air we breathe.

Are you getting your share?

Dull evenings will be a rare thing in your home after you install a radio receiving set.

Think what it means to sit in comfortable chairs in your own rooms and "listen in" to grand opera, to symphony concerts, to splendid programs of vocal music, to enjoy the latest jazz or vaudeville hits, to get the latest scores from the baseball games and other athletic and sport events, to receive the daily market quotations, weather forecasts and interesting news from everywhere.

Think of enjoying right at home among your friends, the

speeches, lectures and sermons by famous men, orators, lecturers and preachers—enjoying yourself and improving your mind in many different ways.

Over five million dollars per week was the amount invested by Americans during the past year for radio equipment.

During 1923 this amount will be much greater, as more people are beginning to realize the advantages and pleasure derived from a radio receiving set in the home.

The radio is here to stay. It is not a fad but a permanent utility, and will rapidly become as necessary in the modern home as the telephone.

Radio is a home developer. It develops a friendly, neighborly spirit. "Radio parties" are popular things in town or country, at the sea shore, or in the mountains.

Money spent for a radio set this year will prove a good investment. Those of our readers who have not yet installed an outfit will do well to look over the advertising pages of this publication and patronize these concerns when buying any equipment. All the advertisers in "LISTENING IN" are responsible people who will treat you fairly and be glad to give you valuable advice and service regarding radio matters.

No questionable advertising matter will ever be accepted by the publishers of this magazine.

The Summer Static Bug-a-boo

We read a very interesting article recently in "Radio Merchandising" on the subject of Summer Static. We thought it so timely and important that we reproduce extracts for the benefit of our readers.

"There is static in the air summer and winter and the past winter there was a lot of it, but it does the most harm when it attacks the human in the region above the neck."

"Static is, after all, a good deal like the little bundle of feathers and scalp ends which the savages worshipped in the belief that such crude symbols held a great power. Such were their fetishes, which they found were of precious little benefit when new ideas broke into the jungle. This static fetishe should be slammed sky high, for its influence, as all of us will realize when we consider it for a moment from a technical point of view, has been greatly overplayed. To complain about static is equivalent to being sorry for the equator. There have always been certain electrical conditions in the atmosphere, and they obtain in winter and in summer."

"Static is no more to be feared than is interference, and yet who has ever heard of any radio fan refusing to use his radio equipment because of this interference. The radio enthusiast

goes blithely about correcting the conditions and generally he does it."

What is Static?

"What are the facts of Static? Static consists of strays or of certain electrical disturbances which must be counteracted if we would have perfect transmission. It furnishes a means of relieving the tedium of success, just as engine troubles keep the automobilist from drifting into the calm of a snug complacency. It is not well for a radioite to be too sure of himself, and static is an antidote to inflation, which is just as good in winter as it is in summer. There is static where there is snow and rain—and plenty of it when the thunder rolls. As there is usually more lightning in the hot months than in the cold ones, we are likely to have a little more static in warm weather. In the tropics, especially in the wet season, the electrical conditions are more productive of static than they are in the temperate zones. The reduction of static, in all climates and in all regions, is a process which has its own technique and is as much a part of the game as the meeting of storm conditions is an essential factor of navigation. By making more use of the 3 electron bulb, by tuning receiving instruments more sharply, by employing directional receiving antennae so that the loop is turned toward the point from which the message is coming, static may, and is, reduced and even eliminated. It has merely become the custom to speak in awe-struck tones about this condition as though everybody would be deeply affected if it were not regarded as something to be dreaded and feared. All the talk about summer static is largely bunk and the radio fan has come to consider radio as much an outdoor sport now as an indoor one."

One can now take radio receivers with them outdoors as well as in. A radio outfit in camp, on the porches or summer homes, at the seashore or lakeside, in the mountains and in the country, will give as much entertainment this summer to radio fans as it does in their city home in the winter.

Just as soon as early summer gets in the air, human beings begin to think about vacations and the great out-of-doors. The "Isaac Waltons" will find their fishing more agreeable with a portable radio set—so will the camper, the canoe-er, and the lucky person who vacationates in the mountains.

The New Broadcasting Schedule

About one year ago the number of Broadcasting stations on 360 meters was giving trouble.

Congress selected the first Radio Conference of experts representing all interests in radio. Within one month they returned

with a new schedule much as it is now going into effect. However nothing was done until the White Bill was introduced and passed the House of Representatives, then it moved to the Senate and died there in December.

By this time all interested in radio were greatly annoyed by the interference and the failure of this legislation. Secretary Hoover, who is faithfully interested in radio, secured special authority to put into operation a revised schedule of wave-lengths presented by the Second Radio Conference, which recently convened in Washington. Beginning May 15th, all broadcasting stations are expected to operate on their new wave-lengths. Since the schedule of wave-lengths extends from 250 to 546 meters for three classes of stations, we expect that interference will be largely eliminated. It will soon be possible to pick out most any station in the country and have no serious interference from other broadcasting stations.

Grand Opera Via Radio

More people have heard Grand Opera this winter than in any period covering many years. To be sure, they have been "listeners in," but the educational advantage offered through the radio has made possible this musical opportunity.

For the fourth time this winter Boston and the surrounding towns and cities will be able to listen to Grand Opera through the courtesy of the management of the Wagnerian Festival. This has been prompted by the enthusiastic reception of "Die Meistersingers."

Speed

The railroad train increased speed to sixty miles, the airplane doubled that, and now we have the wireless wave, which travels so fast it can encircle the earth seven times in a single second.

Some say that the Radio telephone will never be of practical value, because it is not private. Remembering what miracles science has already wrought, none dare predict that even this disadvantage will not be overcome.—*C. C. Dill.*

The ringing of three silver chimes announces programs from KFI.

Teaching Her Electricity

"Jack," said his best girl, one night when they were alone in the parlor, "you are so wonderful and you know so much about electricity, won't you tell me all about it?"

"Sure thing. What do you want to know?"

"Well, what is insulation?"

"Insulation? Now let me see; how shall I illustrate? Oh, yes! Please put on a glove—so! I take your hand in mine. IT IS NOW INSULATED."

"I see. And what is a connector?"

"Take off your glove. Our hands touch. THEY CONNECT."

"Why how simple! What is an ampere?"

"That's a little harder to explain. I take your hand—it is the power that makes me do it. See?"

"Perfectly. But what is a volt?"

He squeezed her hand tighter. "That is voltage electrically speaking."

"Why everything is so easy and nice. What is induction?"

"Hum! That's a sticker. Well, I take your hand. The power and pressure makes it beat harder; they INDUCE IT to speed up."

"How easy."

"Anything else?"

"Why yes. What is resistance?"
Author's Note: Maybe some day I'll finish this.

A Charger—One Dollar

Only too often does the amateur or novice find his storage battery down and in need of a charge. This usually necessitates the lugging of the battery, a mere matter of fifty pounds or so, to a battery station and the expenditure is from fifty cents to one dollar for the actual charging.

Many wish to avoid this work and expense by using a battery charger but as many balk at the price I am going to tell you how to build your own charger for less than a dollar.

The only materials necessary for this charger are:

4 quart fruit jars.

Some strip aluminum (purest you can get.)

Some strip lead.

A few sockets.

Some carbon lamps.

In opposite sides of the fruit jars place a strip of aluminum and lead, an inch or so wide, leaving about an inch or an inch and a half clearance at the bottom for sediment.

Connect them and fill the jars with a saturate solution of borax and water.

They will require cleaning about every month but will charge your battery as well as any battery station.

Caution:

1. Don't forget to put water in your battery.

2. Be sure you connect the positive to the positive and negative to the negative or else you'll spoil the battery.

3. Charge until about five hours after the battery gases freely or until the hydrometer reading is the same as the battery manufacturer recommends.

4. Be sure to use pure aluminum.
R. W. A, Jr.

"IOWA" IS DEAD

The U. S. S. Iowa first radio controlled battleship in the world, has gone to its death in the deep reaches of Panama Bay. Although she still was an American vessel, Coast Battleship No. 4, she was sacrificed in the interests of radio control and naval gunnery by gunfire from her sister ships.

Within a short time another ship will be fitted out. The radio secrets carried aboard the "Iowa" were not lost, say experts of the navy, nor the valuable and confidential radio control instruments.

Plans for the new radio controlled ship are under way with the equipment ready awaiting installation. The ship will be controlled by a mother craft by radio and maneuvered while under fire.

WIRELESS WILLIE
HOW THEY DO IT! IN HOLLAND!



BY ANDY
HOW WILLIE DOES IT!





Just Out

New Apparatus, Devices and Patents

A New Word—Radario

A "scenario" is a symposium of a photoplay.

A "short story" is a literary product for the magazine.

But what is the play produced in the broadcasting station called?

That was the question that confronted Fred M. Smith, studio director at station WLW, and Robert F. Stayman of the same organization, until they devised the word: radario!

It was after a long discussion with officials of station WLW that Mr. Smith conceived the word, "radario."

The word according to Mr. Smith and the officials is a composite of the word radio and scenario.

A "radario" is very different in arrangement from the ordinary play for presentation on the acting stage. It is an especially written and prepared piece of work for use in the radio broadcast studio.

When the radario is written, the author must bear in mind at all times that his audience is of the listening variety and without recourse to the scene of the theater.

No preliminary introduction is necessary, but a brief outline of the scale of the play as well as the characters must be prepared for reading.

Thus arises another new word: descriptionist. He is the man who tells the listening audience of the locale of the play to follow. Not only does the "descriptionist" do this, but he tells the action of the players at the points where it is necessary to keep the action of the play moving.

An Idea

Sometimes, when a "ham" has made his set, and feels confident that it embodies the utmost of everything, he sees another circuit that captivates his fancy, and he is inclined to rip out the one he has just finished and build the new one.

This can be eliminated in the following manner, when worked out neatly: Make up your panel, incorporating all the apparatus you can use, such as variometers, vario-couplers a couple of variable condensers, transformers and tubes.

Then, instead of wiring them directly, bring each instrument out to small jacks, such as are sold in the stores and take up about an eighth of an inch of panel space. Now make up a series of small bridging cords with the plugs on either end. It will then be very easy for you to incorporate any number of hook-ups just by changing the connections.

It is of course understood that all the apparatus is to be mounted on one panel, and that the panel will be large enough to accommodate everything. This is discounted by the fact that you can try out any number of queer circuits, just by shifting your cords.

Try it out fellows. It works marvelously well and you can change your hook-up to suit your mood. If you feel like trying out an Armstrong, all you have to do is to switch your leads, insert your plugs, turn the juice and listen.

Then if you decide that you would rather listen to the tune of a single circuit, it is a matter of five minutes to change your circuits through the agency of your jacks and plugs.

Radio Makes us Immortal

(Continued from page 5)

the "push" of ether and not the "pull" of cosmic attraction that constitutes the phenomenon of gravitation.

He holds that the impingement of ether vibrations tends to push all masses of matter toward one another, because a body casts an ether shadow in proportion to its mass toward another body to which it is apparently attracted.

Bodies differ in weight and mass, he further has determined, because all bodies do not resist the ether exactly according to their mass, with resultant proportionate gravitative force.

If gravitation is a push instead of a pull, then when on the side of the earth away from the sun, we are under an ether pressure of forty tons to the square inch and do not know it!

Almost time for recess now, isn't it?

But one more look at this funny and mysterious ether.

Every thought we think, take it from those supposed to know, shakes the ether, just as every particle of matter, every living thing on the earth, by reflected light, send their images out into the ether.

We may die, but the impressions we make on the ether go on forever. Everything we think or do is thus registered on the vibrating scroll of the firmament!—Something to think about.

Thus ether makes us immortal. What vistas of thought this opens up to us! What a corollary to Shakespeare's apostrophe to Man. What—but there goes WHAM. We have to leave off here and tune in.

"Rome was not built in a day". So, please have a little patience with us. We have had many difficult things to contend with, here in Rochester, in attempting to manufacture a high quality magazine, but we are sticking to the job and believe you will like "LISTENING IN" better as each new issue comes off the press.

Another Radio Bath

(Continued from page 28)

treated for neuritis, discovered she lost a pound. Further treatments brought more reduction. Then persons suffering from no other complaint were treated, with the result that it was found the apparatus was a consistent weight remover, Mr. Clark said.

New Filament Has Nine Lives

(Continued from page 28)

ment lead and that the return lead from the grid circuit be joined in the negative terminal of the "A" battery and not to the negative side of the filament.

As an amplifier the UV-199 requires from forty to eighty volts "B" battery. The base of the tube is the same general design as the standard four-prong base. It is of smaller diameter, necessitating an adapter which has been developed so the tube will fit the standard sockets. There are also new sockets, just put on the market, which will take this tube.

This tube is superior to the UV-201 A as a radio frequency amplifier because of lower capacity between the elements. Of course the UV-201-A is superior as an audio frequency amplifier because it can produce a greater wattage.

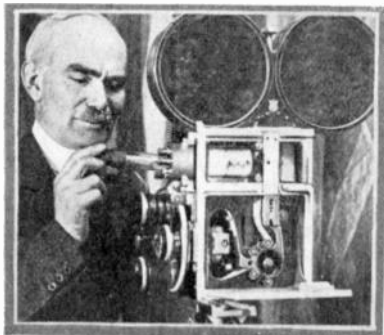
The connections in this base of the tube differ slightly, the plate and grid being diagonally opposite in order to facilitate wiring in multi-tube sets. Care must be exercised in the wiring of this tube to observe this change.

The Association of Composers, Authors and Publishers threaten legal action against broadcasting stations using their compositions without authority. Steps are now being taken to compel stations to pay from \$200 to \$500 a year for the use of their copyrighted music.

Dr. Lee DeForest with His Invention

This shows Dr. Lee DeForest inserting the "Thotion" tube in a motion picture camera in the first public exhibition of his remarkable invention which he calls the phonofilm. This instrument records sound waves on the same film with light waves.

In recording both light and sound waves on the same piece of standard moving picture film, the inventor



Underwood & Underwood Photo makes use of a regular motion-picture camera to which is added a device for recording the sound waves.

The sound waves are first changed into electrical vibrations and thence into light waves, by means of a photo-electric cell and also by means of the famous DeForest audion lamp used in a long distance telephone and radio communication.

Dr. DeForest has already successfully photographed, or rather "phono-filmed" several dances with incidental music, an operatic selection with the singer appearing in the film, and other tests.

WNAC Shifts Wave Length

As a result of the radio conference held in Washington relative to new wave length allocation, Station WNAC, Boston, Mass., shifted its wave length from 360 to 286 meters.

Marion Davies, the movie actress, thinks that radio will eventually be used to acquaint people all over the country with events of importance transpiring in the motion picture world.

Facts To Remember

In building an ideal set it well to remember:

1. Not to use a grained panel in even a slightly damp place.
2. In wiring it is better to wire in curves rather than the right angled bus bar wiring.
3. For efficiency use no spaghetti tubing or a varnished cabinet.
4. For maximum results mount your panel on a brass angle strip. This avoids the use of cabinets. It is also advisable to use a thin panel.
5. Place detector in the tuner. This will shorten up the leads.
6. Do all soldering with good, clean, hard solder.

QUALITY RADIO APPARATUS

AT REASONABLE PRICES.

Sets Made to Order.

Expert Repairing.

Tenth Ward Radio Shop

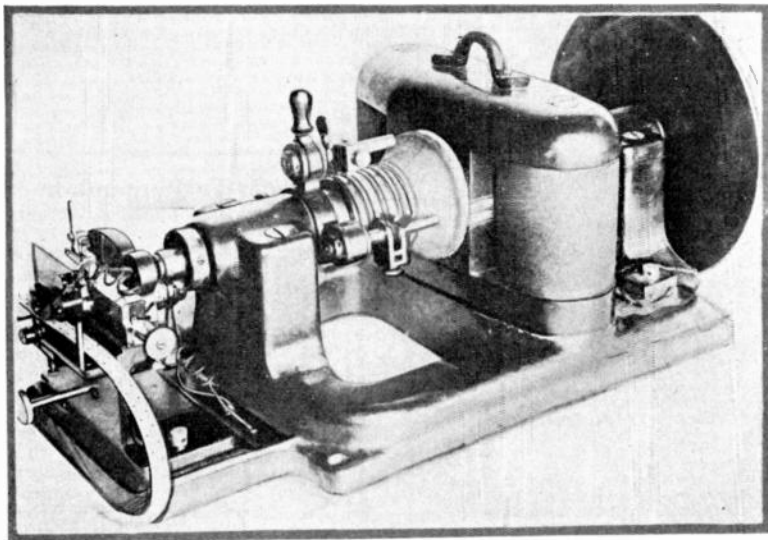
Ridgeway and Dewey Avenues

Ester Block

Rochester, N. Y.

Phone—Glenwood 966

Tell them you saw their ad. in "LISTENING-IN" Magazine.



World-Wide Photo **This Machine Sends the New Alphabetical Code**

NEW ALPHABETICAL CODE

The Chief Signal Officer of the Army, Gen. George O. Squires, announced at the annual meeting of the National Academy of Science, the invention of a new Universal alphabet which applies to radio land lines and 7 submarine cables. It is 2.65 faster than the present Morse Code which was invented 80 years ago.

Radio Uniting Home

Marion Gary, general secretary of the Vermont Council of District Y. W. C. A. 's believes that the radio is helping to bring the home back as the center of attraction for both young and old, girls and boys alike.

On Sunday afternoon in one rural home of which Miss Gary knows, there is standing room only as the radio proves far more attractive than any of the former forms of amusement. This is a good thing, for their one thought seemed to be to get their pleasures away from home.

No Change in Time

Station WOC will continue to broadcast all musical programs, market quotations, weather reports and lectures according to Central Standard Time, the same as heretofore, and those living where Daylight Saving Time is being used will have to be governed accordingly.

New Waves for New York

The New York district has been assigned twelve wave lengths under the Department of Commerce's latest plan to reduce interference in the ether lanes. There are seventeen stations in the New York area which must be accommodated by the twelve new wave lengths.

John Osborne of Philadelphia, Pa., receives radio messages while riding his horse in Fairmount Park. A loop antenna is strapped on his back and the set is attached to the side of the saddle.

Daily Broadcasting Programs

WOC—DAVENPORT, IA.

Central Standard Time

Sunday, May 20

- 9:00 A. M.—Sacred Chimes concert.
 6:00 P. M.—Pipe Organ Recital—
 Erwin Swindell, organist.
 6:30 P. M.—Baseball scores.
 7:00 P. M.—Church Service—Rev.
 W. M. Boaz, Pastor First Presby-
 terian Church, East Moline, Ill.,
 "The Fleeing Shadows."
 8:00 P. M.—Musical program (2
 hours)—P. S. C. orchestra.

Monday, May 21

- 10:55 A. M.—Time Signals.
 11:00 A. M.—Weather and River
 Forecast.
 11:05 A. M.—Opening Market Quo-
 tations and Agriograms.
 12:00 Noon—Chimes concert.
 2:00 P. M.—Closing Stocks and
 Markets.
 3:30 P. M.—Educationa Talk.
 by C. A. Russell.
 5:45 P. M.—Chimes concert.
 6:30 P. M.—Sandman's visit.
 6:50 P. M.—Baseball scores.
 7:00 P. M.—Artist Musical Pro-
 gram—Erwin Swindell, musical di-
 rector. Program furnished by the
**High School Orchestra of Sixty-
 five, under the direction of Julius
 Schmidt.**
 8:00 P. M.—Educational lecture—
 "America and America's Women"
 by Walter D. Milligan, Manager
 Crook Bros. Laundry, Davenport,
 Iowa.

Tuesday, May 22

- 10:55 A. M.—Time Signals.
 11:00 A. M.—Weather and River
 Forecast.
 11:05 A. M.—Opening Market Quo-
 tations.
 12:00 Noon.—Chimes concert.
 2:00 P. M.—Closing Stocks and
 Markets.
 3:30 P. M.—Educational Talk, by
 A. G. Hinrichs.
 5:45 P. M.—Chimes concert.
 6:00 P. M.—Weather and Baseball
 Scores. (No broadcasting on
 Tuesday evening by agreement of
 Tri-City Stations.)

Wednesday, May 23

- 10:55 A. M.—Time Signals.
 11:00 A. M.—Weather and River
 Forecast.
 11:05 A. M.—Opening Market Quo-
 tations.
 12:00 Noon—Chimes concert.
 2:00 P. M.—Closing Stocks and
 Markets.
 3:30 P. M.—Educational Talk by
 D. K. Kirk.
 6:30 P. M.—Sandman's Visit.
 6:50 P. M.—Baseball Scores.
 7:00 P. M.—Musical Program—Erwin
 Swindell, Musical Director, Grace
 Harer, Gertrude McKinsey, Elsie
 Dack and Roscoe Williams.
 8:00 P. M.—Educational Lecture.
 "Electricity on the arm," by
 Jos. Kimmel, of Deleo Light Co.
 10:00 P. M.—Artist Musical Pro-
 gram—Erwin Swindell, Musical
 director, J. Dwight Clark, John
 McGreevy, Mrs. John McGreevy,
 and Banch Whitecomb.
 Immediately following the late mu-
 sica program, "Tourists Road Re-
 port."

..... Thursday, May 24

- 10:55 A. M.—Time Signals.
 11:00 A. M.—Weather and River
 Forecast.
 11:05 A. M.—Opening Market Quo-
 tations and Agriograms.
 12:00 Noon—Chimes Concert.
 2:00 P. M.—Closing Stocks and
 Markets.
 3:30 P. M.—Educational talk by
 Karl G. Stephan.
 5:45 P. M.—Chimes concert.
 6:30 P. M.—Sandman's Visit.
 6:50 P. M.—Baseball scores.
 7:00 P. M.—Artist Musical Pro-
 gram—Erwin Swindell, musical di-
 rector. Program furnished by the
 Washington Band, of Washing-
 ton, Iowa.
 8:00 P. M.—Educational Lecture—
 "Chemistry and its By-Products,"
 by Prof. J. P. Magnusson, Chem-
 istry Department Augustana Col-
 lege, Rock Island, Ill.
Friday, May 25
 10:55 A. M.—Time Signals.
 11:00 A. M.—Weather and River
 Forecast.

- 11:05 A. M.—Opening Market Quotations.
 12:00 Noon—Chimes concert.
 2:00 P. M. — Closing Stocks and Markets.
 3:30 P. M.—Educational talk by C. E. Wilent.
 5:45 P. M.—Chimes Concert.
 6:30 P. M.—Sandman's visit.
 6:50 P. M.—Baseball Scores.
 7:00 P. M.—Musical Program by the P. S. C. Orchestra.
- Saturday, May 26**
- 10:55 A. M.—Time Signals.
 11:00 A. M.—Weather and River Forecast.
 11:05 A. M.—Opening Market Quotations
 12:00 Noon—Chimes Concert.
 2:00 P. M.—Closing Stocks and Markets.
 3:30 P. M.—Educational Talk, by C. C. Hall.
 5:45 P. M.—Chimes Concert.
 6:30 P. M.—Sandman's Visit
 6:50 P. M.—Baseball scores.
 7:00 P. M.—Musical Program—Erwin Swindell, musical director. Appollo Mandolin Club; Henry Dismar and Louis Crowder.
 9:30 P. M.—Dance Program (one hour.) P. S. C. Orchestra.
- WWJ—DETROIT NEWS—580**
Saturday, May 19
- 9:30 A. M.—“Tonight's Dinner” and a special talk by the Woman's Editor.
 10:25 A. M.—Weather.
 11:55 A. M.—Time.
 12:05 P. M.—The Detroit News Orchestra.
 3:30 P. M.—Weather.
 3:40 P. M.—Markets.
 5:00 P. M.—Markets and Baseball scores.
- Sunday, May 20**
- 7:30 P. M.—Church Services from St. Paul's Cathedral.
 2:00 P. M.—The Detroit News Orchestra.
- Monday, May 21**
- 9:30 A. M.—“Tonight's Dinner” and a special talk by the Woman's Editor.
 10:25 A. M.—Weather.
 11:55 A. M.—Time.
 12:05 P. M.—The Detroit News Orchestra.
 3:30 P. M. —Weather.
 4:00 P. M.—Markets.
 5:00 P. M.—Markets and Baseball Scores.
 7:00 P. M.—The Detroit News Orchestra; Anne Campbell, Detroit News Poet; The Town Crier; Mrs. Francis Shamp, contralto; Mrs. Nellie Gorsuch, soprano.

Perfect Radio Enjoyment

When You Use

WEB BRAND BODY CAPACITY REDUCER TUNING IN

MADE EASIER, LESS INTERFERENCE, BETTER RESULTS

At your dealer or send 35c in stamps for package containing
enough for one set.

WEB MANUFACTURING CORPORATION

61-65 ELIZABETH STREET, ROCHESTER, N. Y.

Tuesday, May 22

- 9:30 A. M.—Tonight's Dinner and a special talk by the Woman's Editor.
 10:25 A. M.—Weather.
 11:55 A. M.—Time.
 12:05 P. M.—The Detroit News Orchestra.
 3:30 P. M.—Weather.
 3:40 P. M.—Markets.
 5:00 P. M.—Markets and Baseball Scores.
 8:30 P. M.—The Town Crier; The Detroit News Orchestra; Walter Bates, tenor; Miss Edith Pickles, soprano; Harrison Burch, pianist.

Wednesday, May 23

- 9:30 A. M.—"Tonight's Dinner" and a special talk by the "Woman's editor."
 10:25 A. M.—Weather.
 11:55 A. M.—Time.
 12:05 P. M.—The Detroit News Orchestra.
 3:30 P. M.—Weather.
 3:40 P. M.—Markets.
 5:00 P. M.—Markets and baseball scores.
 8:30 P. M.—The Town Crier; The Detroit News Orchestra; Constance Mattes, soprano; Victor LeBlanc, baritone; William H. Wetherbee, grand commander Knights Templar, speaker.

Thursday, May 24

- 9:30 A. M.—"Tonight's Dinner" and a special talk by the Woman's editor.
 10:25 A. M.—Weather.
 11:55 A. M.—Time.
 12:05 P. M.—The Detroit News Orchestra.
 3:30 P. M.—Weather.
 3:40 P. M.—Markets.
 5:00 P. M.—Markets and Baseball Scores.
 8:30 P. M.—The Town Crier; The Detroit News Orchestra; Mattie B. Lamphere, Soprano; Belle Mangold, contralto.
 11:00 P. M.—The Detroit News Orchestra; Mattie B. Lamphere, soprano; Belle Mangold, contralto.

Friday, May 25

- 9:30 A. M.—"Tonight's Dinner" and a special talk by the Woman's editor.

10:25 A. M.—Weather.

11:55 A. M.—Time.

12:05 P. M.—The Detroit News Orchestra.

3:30 P. M.—Weather.

3:40 P. M.—Markets.

5:00 P. M.—Markets and Baseball Scores.

8:30 P. M.—The Town Crier; The Detroit News Orchestra; Mabel Osborne, soprano; Herbert Lamb, baritone, Mrs. Gus. Sorge, soprano.

Saturday, May 26

9:30 A. M.—"Tonight's Dinner" and a special talk by the Woman's Editor.

10:25 A. M.—Weather.

11:55 A. M.—Time.

12:05 P. M.—The Detroit News Orchestra.

3:30 P. M.—Weather.

3:40 P. M.—Markets.

5:00 P. M.—Markets and base ball scores.

Sunday, May 27

11:00 A. M.—Church Services from St. Paul's Cathedral.

4:00 P. M.—The Detroit News Orchestra.

Miss Ethel Newcomb, nationally known concert pianist and probably the best known radio pianist, will be featured on the Monday evening program of WGY, the General Electric Company Station at Schenectady, N. Y., May 21. On the same program will appear William Demorest, boy soprano, and Edward Rice, violinist.

As a result of a great many requests for another evening by the Georgia Minstrel Boys, the studio manager has prepared an entirely new program for these entertainers for Tuesday night, May 22.

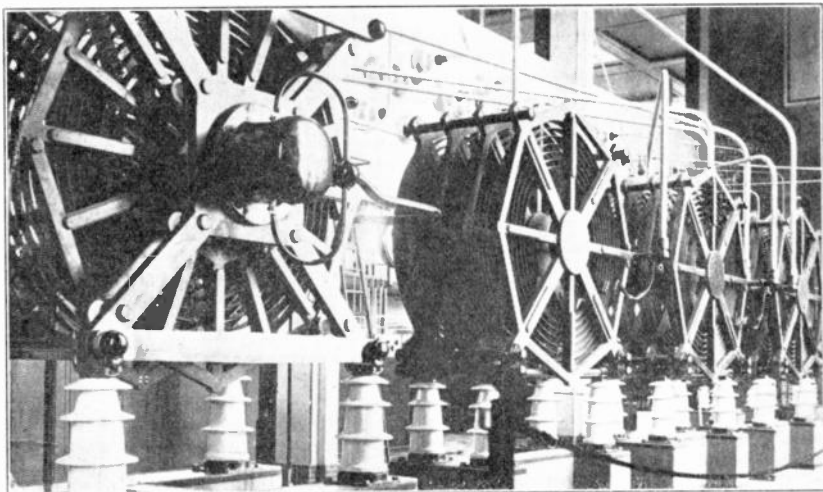
Wednesday night is "silent night" for WGY Players will produce the rollicking Broadhurst farce, "What Happened to Jones."

Major Edgar C. Leonard will deliver an address on Friday night, May 25, on "The Citizens' Military Training Camp."

Sunday, May 20

10:00 A. M.—Service of Frst Presbyterian Church, Schenectady, N. Y. Prelude, "Legende" by Zim-

(Continued on page 57)



International Newsreel

Monster Coils in Berlin Radio Station

Vacuum Tube Survey

A national survey of the vacuum tube supply in this country has been undertaken by the National Radio Chamber of Commerce, it was announced at headquarters of the chamber, 165 Broadway.

This survey, the first to be made and said to be well under way, "vitally concerns every one in the radio industry as well as the public," according to the announcement issued after a meeting of the Board of Governors, at which numerous groups were represented.

Tresham D. Gregg, one of the engineers and managers of the Chamber, said that the survey aims to disclose the actual situation nationally with regard to the tube supply.

Specifically, the supply of the following tubes is concerned: 200, 300, 201, 301, 201-A, 301-A, DV-6, DV-6A, WD 11 and WD 12.

"It is more blessed to give than to receive" is a good motto for a broadcasting station.—Spider Web.

Radiograms can be exchanged between vessels and Syria by means of the Alexandria Radio station. The rate is the same as the rate for Egypt increased by an additional rate of 30 centimes per word.

Federal officers raided a gang of bootleggers in Virginia and heard prices being quoted by means of a Radio set maintained for the purpose.

Church Gets Music by Radio

Many churches have become broadcasting stations, but one at least has turned receiver. First George Presbyterian Church has neither chimes nor organ. Yet each Sunday its congregation is called to church by chimes. At service no organ is visible, but one is distinctly heard.

Both effects are accomplished by means of a radio. An amplifier is attached to a receiving set just above the pulpit. By timing the service just right an organ prelude broadcasting from another church is picked up.

(Continued from page 55)

- menman—George J. Abbott; Bass solo "O God, Have Mercy," from "Saint Paul" by Mendelssohn—James Crapp; Offertory—Anthem, "How Lovely are the Messengers" from "Saint Paul" by Mendelssohn—Mrs. Fred Goetz, Mrs. Harold James Crapp; Junior sermon; Serold Clarke, Thomas Hopkins, mon, "The Ministry of Suffering," Rev. Robert W. Anthony; Postlude, "A. D. MDCXX" MacDowell—George J. Abbott.
- 3:00 P. M.—Symphony concert. Orchestra suite, "Indian Love Lyrics" Finden; Part I (a) "The Temple Bells" (b) "Less than the Dust"—WGY Symphony Orchestra, Leo Kliwen, conductor; Tenor solo, "Where e'er Ye Walk," from "Semele" Handel—Royal Dobson; Orchestral suite, "Indian Love Lyrics" Finden; Part II—(a) "Kashmiri Song" (with Tenor solo) (b) "Till I Wake", Orchestra, Royal Dobson, tenor; Orchestral selection, Excerpts from "Faust" Gounod—Orchestra; Tenor solo, Recitative, "Ye People, Rend your Hearts;" air, "If with all your hearts" from "Elijah", Mendelssohn, Royal Dobson; Orchestral tone poem, "Erlenhugel" ("Hill of the Elves") Kuban—Orchestra.
- 6:30 P. M.—Service of First Presbyterian Church, Schenectady, N. Y. Prelude, "Evensong," Johnston—George J. Abbott; Anthem, "Now the Day is Over", Targett—Mrs. Fred Goetz, Mrs. Harold Harold Clarke, Thomas Hopkins, James Crapp; Offertory, Soprano solo, "The Ninety and Nine" Campion—Mrs. Fred Goetz; Ser-Fred Goetz; Sermon, "A Message from Dwight L. Moody"—Rev. Robert W. Anthony; Postlude—"Sortie in F" Rogers—George J. Abbott.
- Monday, May 21**
- 11:30 A. M.—Stock market quotations
- 11:45 A. M.—Weather report on 485 meters.
- 11:55 A. M.—U. S. Naval Time Signals.
- 1:00 P. M.—Music and address, "Citizenship," Mrs. F. K. Taylor, Schenectady Women's Club.
- 5:00 P. M.—Produce and stock market report and quotations; news bulletins; baseball results.
- 7:40 P. M.—Baseball scores.
- 7:45 P. M.—Musical program—Piano solos, (a) "Perpetual Motion" Weber; (b) "Song without words" Mendelssohn—Ethel Newcomb; Boy soprano solo "The Swallows", Dell'Aequa—William Demorest, Mrs. K. Chamberlayne, accompanist; Violin solo, "Andante movement," from "Symphonie Espagnole" Lalo—Edward Rice, Earl Rice, accompanist. Piano solos, (a) "Scherzo in C Sharp Minor" Chopin; (b) "Two Etudes" Chopin—Ethel Newcomb; Selection for piano and violin, Second Movement of "Kreutzer Sonata" Beethoven—Ethel Newcomb, pianis, Edward Rice, violinist; Boy soprano solo, "The Kiss Waltz," Arditi—William Demorest; Violin solos, (a) "En Bateau" Debussy; (b) "Serenade" Valdez—Edward Rice; Piano solos, (a) Chanson Triste" Tschaiakowski; (b) "Humoresque" Tschaiakowski — Ethel Newcomb; Selection for piano and violin, Finale Presto Movement of "Kreutzer Sonata" Beethoven; Ethel Newcomb and Edward Rice; Piano solo, "Prelude in G minor" Rachmaninoff—Ethel Newcomb.
- Tuesday, May 22**
- 11:30 A. M.—Stock market quotations.
- 11:45 A. M.—Weather report.
- 11:55 A. M.—Time signals.
- 1:00 P. M.—Music and address, "Care of the Electric Range" (courtesy of Modern Priscilla).
- 5:00 P. M.—Produce and stock market quotations; news bulletins; baseball results.
- 7:35 P. M.—Address, "Those Ceathers on Your Hat," by Helen R. Haines, New York State Conservation Commission.
- 7:40 P. M.—Baseball scores.
- 7:45 P. M.—Musical program by Georgia Minstrel Boys. Part I—

Grand Opening Number, Medley of Old Southland Melodies, Clarkson—WGY Orchestra; Introducing some Darktown Humor, Georgia Minstrel Boys; Male quartet selection, "I Wish I was in Dixie" Foster — Orchestra introduction with the Radio Four; Humorous Dialogue, William Jackson and Washington Lee; Baritone Solo, "Georgia Cabin Door" Young-Squires—Washington Johnson Lee Orchestral selections, Finale to Part I, Medley to Recent Popular Southern Songs, including "Swanee Smiles," "The Heart or Virginia," "Lonesome Mamma Blues."—Orchestra; Olio—Part II —Orchestral selection, "My Southern Home" Polak — Orchestra; More "Black Trash"— Georgia Minstrel Boys; Tenor solo, "Mah Mandy Lee" Hiller—Tumbo Jones; Male Quartet selections, (a) "Kentucky Babe" Geibel; (b) "Massa's in de Cold, Cold Ground" Foster—Radio Four; Grand Finale, including "Hot Time in the Old Town Tonight"—Minstrels and Orchestra.

Wednesday, May 23

- 11:30 A. M.—Stock market quotations.
 11:45 A. M.—Weather report.
 11:55 A. M.—Time Signals.
 5:00 P. M.—Produce and stock market quotations; news bulletins; baseball results.
 SILENT NIGHT.

Thursday, May 24

- 11:30 A. M.—Stock market quotations.
 11:45 A. M.—Weather forecast.
 11:55 A. M.—Time signals.
 1:00 P. M.—Music and address, "Foods for Growth—Milk," by Mary G. McCormick, Supervisor of Nutrition, New York State Department of Health.
 5:00 P. M.—Produce and stock market quotations; news bulletins; baseball results.
 7:40 P. M.—Baseball scores.
 7:45 P. M.—Radio Drama "What Happened to Jones." Instrumental selection from the musical comedy "You're in Love". Friml-

Schirmer — WGY Instrumental Quartet; Farce, "What Happened to Jones" by Geo. Broadhurst—The WGY Players; The Cast—Jones, who works for a Hymn Book House—Edward H. Smith; Anatomy—James Mullarkey; An-Ebenezer Goodley, a Professor of thony Goodley, D. D., Bishop of Ballarat—Frank Oliver; Richard Heatherly, engaged to Margery—Edward E. St. Louis; Thomas Holder, a policeman—Courtland Hopkins; Williams Bigsbee, an inmate of the Sanatorium—Burton Anthony; Henry Fuller, Supt. of the Sanatorium—Herman Schulman; Mrs. Goodley, Ebenezer's wife—Ida Myrick; Gissy, Ebenezer's Ward—Margaret V. Smith; Margery, Ebenezer's daughter—Ruth Schilling; Minerva, Ebenezer's daughter—Lola Somers; Helma, a Swedish Servant Girl—Viola Karwowska. Place New York city; Time—Present; Act I—In the home of Ebenezer Goodley; Time, 7:15 P. M.; Instrumental Selection, "By the Side of the Streamlet" (Request) Boisdefre—Quartet; Act II—Same as Act I. Time—Fifteen minutes later. Instrumental selection, from the musical comedy, "Maytime" (Request) Romberg-Schirmer—Quartet; Act III—Same as Act I; Time Ten minutes later; Instrumental selection "Scene de Ballet" Bendix—Quartet.

Friday, May 25

- 11:30 A. M.—Stock market quotations.
 11:45 A. M.—Weather forecast.
 11:55 A. M.—Time signals.
 1:00 P. M.—Music and talk, "Furnishing the Bedroom (courtesy of Modern Priscilla).
 5:00 P. M.—Talk for the children.
 7:35 P. M.—Health Talk, "Feeding the Baby during Hot Weather," State Department of Health.
 7:40 P. M.—Baseball scores.
 7:45 P. M.—Musical program—Instrumental selection, "Estudiantino" Waddtenfel—The Red and White Trio, C. Ceglarski, violin, Or'and De Masi, violin, Isabel

Sturgoleski, piano; Soprano solo, "Little Azure Rings" Cameron—Marjory Barnes, Myra Scott, accompanist; Piano Solo, "Valse Chromatique" Godard—Raymond Heindorf; Address, "The Citizens' Military Training Camp" Major Edgar C. Leonard; Instrumental selection, "Baccarolle," Offenbach—The Red and White Trio; Reading, "Cohen on the Radiophone" (Request) Anon.—Lillian Fisher; Piano solo, "Kamenci Ostrow" Rubenstein—Raymond Heindorf; Soprano solos, (a) "Such a Lil' Fellow" Diehlmont, (b) "The Call of Love" Ward—Marjory Barnes; Instrumental selection, "Waves of the Danube" Ivanovici—The Red and White Trio; Reading, "Goblins" Anon.—Lillian Fisher; Piano solo, "Adagio," from "Moonlight Sonata" Beethoven — Raymond Heindorf; Soprano solo, "Where the Sad Waters Flow" Lieurance—Marjory Barnes; Reading, "Three Winners" Anon.—Lillian Fisher; Piano solo, "Liebestraum" Liszt—Raymond Heindorf.

Friday, May 25

(Late Program)

10:30 P. M.—Concert program. Instrumental selection, "Intermezzo" Brooks—WGY Instrumental Quartet; Quartet selections, (a) "Marching" Nevin; (b) "Until the Dawn" Parks—Crack-A-Jack Four Male Quartet, George Stoehr, Samuel Shepherd, Arthur Van Patten, W. Albert Anderson, Mrs. George Rose, accompanist; Piano solos, (a) "To a Wild Rose" MacDowell—Joseph Walsh; Instrumental selection, "Scherzetto" Pabst—Quartet; Quartet selections (a) "Kentucky Babe" Geibel; (b) "Honey I Want Yer Now" Coe—Crack-A-Jack Mae Quartet; Piano solos (a) Song from the "Sea Pieces" MacDowell; (b) "Twilight" Friml-Schmidt — Joseph Walsh; Instrumental selection, "Serenade" Rollinson—Quartet; Quartet selections, (a) "Story of a Tack" Parks; (b) "Fishing" Parks—Crack-A-Jack Male Quartet; Piano solo "Polonaise in A"

Chopin—Joseph Walsh; Instrumental selection, "Entre'aete Valse" Hellemsberger—Quartet.

Saturday, May 26

11:30 A. M.—Stock market quotations
 11:45 A. M.—Weather forecast on 485 meters.
 11:55 A. M.—U. S. Naval Observatory time signals.
 8:00 P. M.—Dance music by Cain's Castle orchestra.

KSD—ST. LOUIS—546

Monday, May 21

8:00 to 9:45 P. M.—Broadcasting music program from Grand Central Theatre. Overture "Firefly" (Friml) Grand Central Concert Orchestra, Gene Rodemich, conducting; Larry Conley, trombone soloist, Michel Gusikoff, violinist.
 11:30 P. M.—Broadcasting program of Gene Rodemich's Orchestra at Hotel Statler.

Tuesday, May 22

8:00 P. M.—Marguerite Wessels, soprano; Adelaide Blase and Genevieve Seibert, violinists; Ruth Haynie, O. R. McHughes, and Brittie Lee McGee, pianists. Address, "Veterans of the Allies" Capt. Francis L. Tottenham, O. B. E., Royal Navy, Naval Attache' to the British Embassy in Washington; Address, "Municipal Opera" Nelson Cunliff, Chairman Executive Committee, Municipal Opera Association of St. Louis.

Wednesday, May 23

8:00 to 9:45 P. M.—Broadcasting music program from Missouri Theatre, Overture "Egmont" (Beethoven) "The Saw Mill River Road", Missouri Concert Orchestra; Organ recital, Stuart Barrie, Vocal specialty by Cliff Nazaro; Band Specialty by George Hall and his society orchestra.

Thursday, May 24

SILENT.

Friday, May 25

8:00 to 9:45 P. M. Program from Grand Central Theatre, Michel Gusikoff, violinist; Larry Conley, trombone soloist; Arthur L. Utt, organist. Gene Rodemich's Concert orchestra.

Saturday, May 26

8:00 to 9:45 P. M.—Broadcasting music from Missouri Theatre, organ recital by Stuart Barrie; Program by Isadore Cohen's Orchestra and vocal selections

KDKA—PITTSBURGH—350**Saturday, May 19**

9:00 A. M.—Music.
 11:30 A. M.—Music, Weather Forecast, United States Bureau of Market Reports.
 2:00 P. M.—Concert.
 2:15 P. M.—Score by innings of the baseball games played today.
 5:00 P. M.—Baseball scores.
 5:05 P. M.—Organ Recital from the Cameo Motion Picture Theater, Pittsburgh, Pa., Howard R. Webb, organist at "The Giant Wurlitzer."
 6:00 P. M.—Baseball scores, Current events.
 6:15 P. M.—Addresses.
 6:45 P. M.—The Visit to the Little Folks by the Dreamtime Lady.
 7:00 P. M.—Baseball Scores, National Stockman and Farmer Market Reports.
 7:30 P. M.—Concert by Mearle W. Forney and Choral Club of Butler St. Methodist Episcopal Church, Pittsburgh, Pa. Program: "In plamatus," Rossini; "Rigoletto," Verdi; "The Lass with the Delicate Air," Arne; "Do not Go, my Love," Hageman; "The Year's at the Spring," Beach; "Largo" Handel; "My Faith Looks up to Thee," Schaecker; "I Heard You Pass by," Woods; "I Dreamed I Heard You Singing," Marshall; "Lucia di Lamermoor," Donizetti; "Fairy Bark," Ware; "Day-Fanning; "Minor and Major," Spross; "The Lost Chord," Sullivan; "By Babylon's Wave," Gounod.

KYW—CHICAGO—400

Daylight Saving Time

Saturday, May 19

9:30 A. M.—Late news and comment of the financial and commercial market.
 10:00 A. M.—Market reports.
 10:30 A. M.—Late financial news and comments.

10:58 A. M.—Naval Observatory time signals.

11:00 A. M.—Weather reports.

11:05 A. M.—Market reports.

11:30 A. M.—Late news and comment of the financial and commercial and commercial market.

11:35 A. M.—Table talk by Mrs. Anna J. Peterson of the Peoples' Gas Company.

12:00 M.—Market reports.

12:30 P. M.—Late financial news and comment.

2:15 P. M.—Late financial news and news bulletins.

2:30 P. M.—Closing stock quotations, Chicago Stock Exchange.

3:00 P. M.—Late news and sport bulletins.

4:15 P. M.—Stock report and late news bulletins.

4:30 P. M.—News and sport bulletins.

5:00 P. M.—Latest news of the day.

6:30 P. M.—News, financial and final market and sport summary.

6:40 P. M.—Children's Bedtime story.

8:00 to 8:58 P. M.—Musical program, courtesy of the W. W. Kimball Company. Program will be phoned from Kimball Hall, Chicago and will include selections on the Kimball Pipe Organ.

Program will be announced by Radiophone.

8:58 P. M.—Naval Observatory time signals.

9:00 P. M.—Weather reports.

9:05 to 9:25 P. M.—"Under the Evening Lamp" service including stories, articles and humorous sketches. This service is furnished by the Youth's Companion.

Sunday, May 20

11:00 A. M.—Central Church services broadcast from Orchestra Hall, Chicago, Ill., Dr. F. F. Shannon, Pastor. Musical program under the direction of Daniel Protheros.

3:30 P. M.—Studio Chapel Services will be broadcast from the Westinghouse station KKY at 3:30 p. m. Rev. Ernest Bourner Allen, Pilgrims Church, Oak Park, Ill.

7:00 P. M.—Chicago Sunday Evening Club Services Broadcast from Orchestral Hall, Chicago. Special musical program will be given by the choir of One Hundred under the direction of Edgar Nelson. The speaker of that evening will be Cornelius Weolfkin of New York City.

SPRINGFIELD, MASS.—422

Eastern Standard Time

Saturday, May 19

7:30 P. M.—Bedtime story.

7:45 P. M.—Literary Evening "Under the Evening Lamp," from the Youth's Companion.

8:00 P. M.—Baseball scores. Concert by John L. Thompson, baritone; Miss Grace Thompson, pianist.

9:00 P. M.—Baseball scores.

Sunday, May 20

8:15 P. M.—Church services conducted by Rev. R. B. Lisle, pastor of the Highland Methodist Church of Holyoke, assisted by the church quartette.

Radio, Restless Mystery

By WILL CHAMBERLAIN

I had dreamed that quiet atmosphere
 screened lips of such surpassing song,
 I had not known that love and hope
 and fear
 From hearts afar could this same
 stillness throng.

I had not dreamed that oratorical
 pleas
 Peak-touching flights of forums
 elsewhere,
 Could flash, as on a silver-pinioned
 breeze,
 To me across the ocean waves of air.

But now I know, and knowing,
 pause to think.
 O restless hand that picks from sky
 and cloud
 The gems of mystery, and with them
 spaces link—
 You have high fellowship with God.

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Summer Outlook

Almost every business and industry reaches a peak and a low point of activity during the year. The high tide of radio is midwinter and the low tide summer. The outlook for the coming summer is a great deal better than it was at this season a year ago.

Last April 1 there were only 137 broadcasting stations and the majority of low power. There were large areas where concerts could only be received from stations a great distance away. The result was that the long hours of sunlight hindered the radio waves from reaching the localities where long distance reception had to be depended upon for entertainment. A station may have sufficient power to blanket several thousand miles during the winter, but its radiations may be limited to only a few hundred miles in the summer.

Patronize our advertisers.

Novelty to be Broadcast

A novel form of radio entertainment will be broadcast from Westinghouse Station KYW, Friday Night at 10 o'clock, when the entire cast and chorus of the men's theatrical organization, Blackfriars, at the University of Chicago present their 1923 production, "The Filming of Friars" in the KYW Studio. All of the parts in the musical comedy, including the feminine roles are played by men.

Among the song hits of the show, to be presented by the cast and chorus are, "Is Isabelle In," "Hollywood Bound," "Jungle Nights," "Maid of the Moon" and "Row Me Romeo."

A special feature in connection with the revue will be additional musical selections of the "Filming of Friars" played by the Phoenician Jazz Band.

The music for the entire production was written by three members of last season's production, Leslie Rivers, Russell Pierce and Knowles Robbins.

The leading feminine role will be played by Robert Jenkins, son of Dr. E. W. Perkins, president of the University of Omaha. John Longwell of Oak Park, Ill., a freshman, will play the movie hero lead.

"Filming of Friars" was written by Earle Ludgin, a junior at the

University. Hamilton Coleman, a prominent theatrical manager in Chicago, is the director of the production and will aid W. J. Wetherbee, director of KYW, in presenting the comedy to the radio fans of the United States.

Following is the cast:

Fanchion Charamain, the heroine.
—Robert Jenkins.
—Bil Hardy, the hero—John Longwell.

Ethelind Neilson, the movie vamp.
—Clark Shaw.

Roland Bushnell, a matinee idol.
Robert Allen.

Dixon, the drector—Lester Westerman.

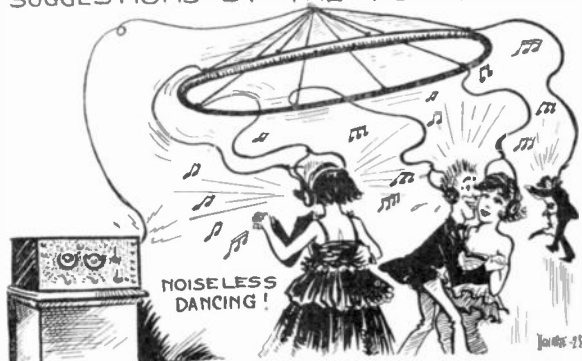
Mr. and Mrs. Rutherford, parents of the heroine—Ralph Helperin and James Kemp.

Jean Marie, an ingenue—Archie Trebow.

Gately, assistant director—Porter Burleigh.

All London is in the throes of wireless telephony, according to W. E. Wroe, of San Antonio, Texas, who arrived last week in New York after a long stay in England. One of the novel uses to which the new marvel has been put is the radio sandwich man who parades up and down the Strand and Piccadilly with a complete radio outfit. He is able to pick up all the stations, and all passers-by get an earful.

SUGGESTIONS BY THE "NUT" EDITOR.



Dancing to Jazz which Does Not Disturb the Neighbors

Hints to the Amateur

Study your drawings with the greatest care. Learn to read them and understand just what they mean. This is the secret of rapid, efficient and satisfactory work.

Be sure you understand both drawings and specifications before you touch a tool. An observance of this rule will not only save time but prevent the waste of material and temper.

"Order is Heaven's first law." Nature is the best example of the truth of this saying. Have a place for everything and keep everything in its place. This means not only tools, but materials such as screws, nuts, bolts, connectors, binding-posts—in fact all small parts.

Perform every task to the best of your ability—as if it were the only chance you would ever have to do this particular bit of work and do it right. "That's good enough" has no place in the good workman's vocabulary.

"It's a poor workman who complains of his tools." Many amateurs cannot afford a full set of tools are obliged sometimes to make one tool do the work of several. It is surprising how few tools are required.

Neatness and care in every operation performed will pay big dividends in results. Good work cannot be hurried even by a skilled mechanic. The principal advantage of a professional workman over the amateur is due to experience. After you have drilled as many holes as the man in the shop around the corner, you may be able to drill as many per hour as he; but if you take plenty of time, you can do each job now as well as he can.

Especial care should be exercised in making electrical connections and in following directions explicitly wherever they have to do with parts which transmit electric current. A half-soldered joint, a poor electrical contact or using too much flux when soldering will cause the failure of

the best piece of electrical apparatus ever built.

When designing a panel, lay it out on paper first. This is a good way to save material and disappointment. Keep your tools sharp and clean. An oilstone, a rat-tail file and a three-cornered file are sufficient to keep your tools in first class working order. All tools, especially those not in constant use, should be wiped at least once a week with an oily rag. This prevents rust—the sign of a careless workman.

Clean up the dirt and chips when you have finished work. This prevents a possible fire hazard, helps your standing with the family and gives a personal satisfaction such as only can be enjoyed by one who has learned to do things

U. S. Broadcast Stations

WLAF—Johnson Radio Co., Lincoln, Nebr.

WLAG—Cutting & Washington Radio Corp., Minneapolis, Minn.

WLAH—Samuel Wordsworth, Syracuse, N. Y.

WLAJ—Waco Electrical Supply Co. Waco, Texas.

WLAK—Vermont Farm Machinery Corp., Bellows Falls, Vt.

WLAL—Tulsa Radio Co., Tulsa, Okla.

WLAM—Morrow Radio Co., Springfield, Ohio

WLAN—Putnam Hardware Co., Houlton, Me.

WLAO—Anthracite Radio Shop, Scranton, Pa.

WLAP—W. V. Jordon, Louisville, Ky.

WLAQ—A. F. Schilling, Kalamazoo, Mich.

WLAR—Mickel Music Co., Marshalltown, Ia.

WLAS—Central Radio Supply Co., Hutchinson, Kans.

Each week a portion of our list of broadcasting stations in the U. S. will be printed here until the list is complete.

Be Sure To Get The May 30th Issue

(THE MEMORIAL DAY NUMBER)

—of—



The RADIO Illustrated MAGAZINE

Special Features

Timely articles on radio subjects and the latest news illustrated by many interesting photographs and original drawings.

Underground Radio — Modern Miracle of Broadcasting—How Weather Affects Radio—Radio in the Country — Amateur's

Round Table—How To Do It—Trouble Finder Department—Questions and Answers—Radio Lessons for Beginners—Complete Daily Broadcasting Programs as far in advance as we are able to obtain them from the principal stations in this country.

Just as this week's issue of "LISTENING IN" is much better than the first number (May 5th edition) so will our next magazine—**Memorial Day Number**—be an improvement over this.

"LISTENING IN" keeps you posted on the latest events in the radio world. It gives interesting articles, helpful advice concerning radio subjects.

You do not have to be an electrical engineer or radio expert in order to comprehend and enjoy every issue of this weekly magazine.

"LISTENING IN" is published every other week and is on sale Thursdays. Price 10c a copy; six months one dollar; one year for two dollars.

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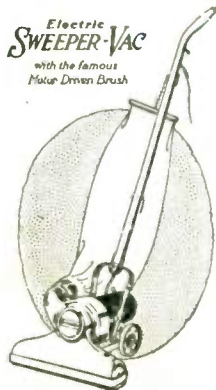
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