May 30, 1923 Price 10 Cents

LISTENING-IN

The Illustrated Non-Technical Radio Magazine

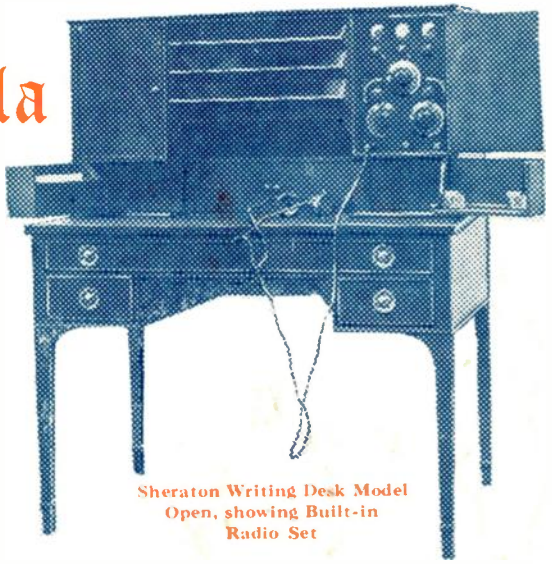
Vol. I No. 3

Latest Radio News, Interesting Features, Illustrations, Helpful Information

The Clayola

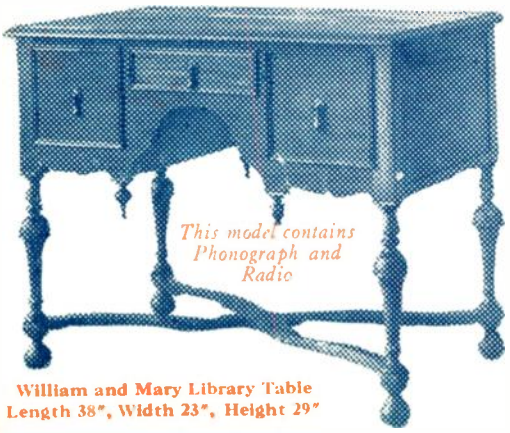
Radio-Phonograph-Library Table

Three-In-One Combinations



Sheraton Writing Desk Model
Open, showing Built-in
Radio Set

Designed by America's oldest and most famous cabinet-makers, Irving & Casson of Boston. The tone chambers are constructed of spruce furnished by Steinway & Sons from the fine stock used for their wonderful sounding boards. *The tops of* "CLAYOLA" Library Tables *do not raise.* An exclusive patented arrangement provides a "*swing-out*" turntable at the end for phonograph and changing of records. A high quality radio set may be enclosed in the desk as shown above and one is enclosed in the Library Table shown below.



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Length 38", Width 23", Height 29"

You cannot afford to miss seeing this line. The finest made in the world today.

Write now for illustrated brochure showing different models and styles of "CLAYOLA" Combinations.

Attractive terms and territory now open to dealers.

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Rochester, N. Y.

LISTENING IN

RADIO · ILLUSTRATED MAGAZINE

Devoted to the welfare of everything connected with radio

Vol. I | May 30, 1923 | No. 3

CONTENTS

"Listening In" is published every other week by Will W. Zimmer, Inc. Subscription rates: six Months $1.00; one year $2.00. On sale at news stands and radio equipment stores at ten cents per copy.

Application made for entry as second class matter at United States Post Office, Rochester, N. Y.

For advertising rates and other information address Will W. Zimmer, Inc., Publishers, 47 North Clinton Ave., Rochester, N. Y. Stone 5798

PUBLISHER'S PAGE

This edition of "LISTENING IN" is only the third issue of our RADIO Illustrated Magazine, yet we believe you will agree with us that it is a vast improvement over the first issue.

In this edition we present many instructive articles of practical help as well as the latest radio news and interesting illustrations. It is crammed full—from cover to cover—with text matter which should appeal to every radio fan as well as others who are just beginning to become interested in the subject.

We must be pleasing our radio public, because our news stands sales are increasing with each issue of "LISTENING IN" and every day we receive new subscriptions from different parts of the country where an earlier copy of the magazine has fallen into the hands of some radio fan.

We especially call your attention to the welcome freedom from printer's errors and the general improvement in typography, printing, binding and trimming of this third issue of our magazine, due to a change in printers which we made in time to produce this Memorial Day Number. It is with great relief we announce that at last we have secured a printer in Rochester fully capable of turning out a magazine which comes up to our demands and expectations. If our readers could realize the printing conditions we have experienced during the past five weeks, they surely would be surprised that we were able to produce the first two issues as well as we did!

To make every future issue of "LISTENING IN" helpful and interesting to our radio friends, we are constantly increasing our staff and getting in touch with new sources of radio news and instructive information.

We have already secured many special news correspondents located in the most important centers throughout the state and country who will provide us promptly with the latest radio news for each issue of "LISTENING IN".

Our magazine is profusely illustrated with human-interest photographs, drawings and practical hook-ups. We realize that there is still much room for improvement and trust our readers will not hesitate to send in any suggestions or ask us questions regarding their radio problems.

Our staff of technical editors are at your service to render all the help they possible can.

The next number ("LISTENING IN" is published every other week during this summer) will be dated June 16th and will contain many articles showing the advantages and the entertainment to be derived from radio receiving sets during the summer months and on vacation trips. You will find every issue of this magazine full of timely news and easy-to-understand radio information.

Will W. Zimmer
Publisher

Artists and Music Publishers Lack Vision

While the commercially-minded song publishers, properly organized to protect their copyrights on popular songs, are agreed they should receive royalties from broadcasting stations using their songs, the artists themselves are not entirely in accord with the publishers.

Many theatrical artists are taking part in radio concerts, firmly believing that their broadcasting activities make for increased prestige and popularity.

One of the most prominent young stars of Broadway fame, Miss Vivienne Segal, is the leader in expressing the opinion that no theatrical person is hurt by being heard over radio.

Miss Segal, who has starred in numerous productions, maintains that radio broadcasting heightens one's popularity and she insists that much is gained by singing to radio fans.

"Not only does singing over radio make one more popular," declares Miss Segal, "but it is a means of giving enjoyment to those who, by reason of their distance from New York and other play centers, cannot hear the artists from the stage."

Of course, Miss Segal is correct in her attitude and the attempts on the part of song publishers to deprive a lot of people of interesting features are to be criticised. These music publishers are unjust and selfish but really are losing a regal opportunity of exploiting new song offerings.

Artists are aided by publicity. Without recognition they are lost and business men who have studied psychology maintain that radio fans are ever interested in the radio entertainers. Whenever the opportunity arrives, therefore, they will want to see the radio performer in person.

Music publishers, like professional show men, seem to fear radio. They saw disaster in sight when the phonograph began to become popular and (in those days) forbade their artists to enjoy the fame and fortune that was awaiting them.

Professional theatre folks — meaning the managers—deride the prevalent radio enthusiasm and yet in the same breath admit its "pulling" qualities by placing restrictions upon their employees, the artists.

Those theatrical performers who are defying the theatrical magnates and are in radio, are blazing a trail and some of these days, when artists are engaged for radio work, those who will receive financial rewards can thank the present volunteers.

Radio broadcasting can damage no one, not even the music publishers, for if their new offerings sound pleasant to a radio listener, what is more natural than the acquisition of a copy of the music enjoyed?

Gloria Is An Enthusiastic Radio Fan

Gloria Swanson, popular motion picture star, has been inoculated with the radio germ and as a consequence she has developed a serious case of radioitis.

In the photograph Gloria is seen displaying one of the most pronounced symptoms of this new malady, which, it is reported, is rapidly spreading throughout the film colony in California.

After the first stage of the attack, which manifests itself in the form of the patient expressing a desire to "listen in" most of the time, the next stage results in the afflicted one desiring to build their own receiving sets, and in fact, become a genuine "bug" on the subject of radio.

Gloria says she has not reached the later stage as yet, but she believes the privilege of being able to listen in is one which affords excellent entertainment.

HER MAGIC CABINET

Gold Star Mother Says it is Connecting Link Between Her and Departed Hero; Hears Same Musical Compositions He Played for Her before War Service Ended His Career

There are few individuals who have not at some time heard of various types of miracles taking place, some of which sounded plausible and excited only causual interest, while others were so tremendous in scope and significance as to seem actually incredible, despite the fact that they were vouched for by persons whose reputations are above reproach.

Regardless of these facts, however there are few of us indeed who have lived to witness the actual passing of such incidents in our lives as that which was disclosed recently in the life of a Rochester woman.

Bowed down with a double sorrow brought about through the death of her husband in an automobile accident which was followed soon afterward by that of her only son, who was killed in action during the Argonne offensive this little gray motherly woman apparently withdrew entirely from outside associations and buried herself within the veil of sadness which enveloped her. For several months this was her outward attitude on life in general. Former intimate friends hinted openly that this little woman's heart and soul had been lost with her loved ones and that nothing but the most dire and bitter existence remained for her upon this earth, despite her cozy little apartment in the southeastern part of the city.

Then the miracle happened. One morning with no apparent reason to justify her action, considering the broken-hearted demeanor she had displayed for so long a period, this little woman joyfully hailed a neighbor who was passing and confided to her the secret of the change which had taken place.

"I shall mourn no more the loss of my boy and the brilliant career which was before him as a musician and composer. I am convinced that he is not entirely lost to me, as I believed at first, for last evening I heard the same wonderful compositions he used to play for me, right here in this room and while he was not here in person, I am sure I felt him in spirit—and the music—just as he used to play it, was wonderful."

The friendly neighbor was at a loss to understand the remarkable change which had come over the lonely, sad-eyed little woman. She hastened to question her regarding the strange influence which had brought about such a surprising difference.

The little woman led the way into the room in which her son had always played his selections before he enlisted in the cause of democracy. On a table, beside the life-size, flag draped picture of her boy, stood a mysterious black cabinet.

"That is the magic box," declared the little woman, her eyes glowing as she proceeded to relate how she had regained the almost unbelievable privilege of again hearing those wonderful compositions her son had played for her so often. "By means of that box, a gift to me by a nephew, I have been able to hear the same selections and soothing symphonies which had been so dear to me. The box is usually referred to as a radio receiving set, but to me it will always be my magic cabinet."

The neighbor departed, eager to spread the news of the little woman's apparent reincarnation among her friends.

No more did the motherly little woman sit in that front room and mourn her fate. With the exception of his earthly presence, there was little difference observed by

the mother now that she could again hear her boy's compositions played.

And after the nation had finished paying tribute to its dead heroes on Memorial Day, she had the relief of seeking refuge again in the enveloping strains of her son's music from the renewed sorrow the customary exercises held on that day invariably bring to those mothers who made the greatest sacrifice on the altar of humanity.

This is How You Do It

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 complete, 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.

Pays Homage to "Tut"

Radio, as usual, is abreast of the times. Ever since the discovery of Tut-ankh-Amen's resting place and the treasures buried with him, there has been a mad rush to make everything we wear and do correspond to that period in ancient Egypt. So Station WJAX, of Cleveland, broadcasted a radio night in Egypt and made quite a hit. This is the first time, I believe, that radiophony has been used to pay homage to King Tut, who, if he could see and hear again would find just a few things of which his age could not boast—Radio among them.

A Warning to the Youth

Recently a boy of 16 years rose early one morning to fasten his wires to the rear porch of his home and in doing so he tossed the ends across an electric light service wire, the ends of the antenna falling to the next door yard. He ran down and grapsed them. The wires stuck and he tugged and twisted them. This tugging wore the insulation from the electric light wires and there was a flash. The boy fell to the ground screaming —his hands and arms were burned by the high voltage which had run through his antenna wires. He was started for the hospital but he died en-route.

Radio experts can draw a lesson from the tragedy, pointing to it as a warning to youthful Radiophans for exceptional care in the preparation of their sets in the city and the dangers of permitting antenna to be too close to power and light wires.

Outdoor Antenna

By driving a nail into its top and bottom and making connections, any tree may be converted into an antenna that will actually work. And this antenna is the one kind that will be more efficient in summer than in winter, for the very foliage that is regarded as an "unfavorable" radio condition will make it absorb more energy

Fine Results

Radio is of great value for the sick, especially in stubborn, chronic cases. Its interesting programmes and the vital healthy way in which they are given have a highly beneficial effect on patients.

NEW EQUIPMENT FOR NAVAL MILITIA

Three Rochester Units to Have Powerful Sending and Receiving Sets Installed at Summerville Armory and on Board Sub Chaser 433; Amateur Radio Operators Can Obtain Special Training with this Equipment

With the advent of warm weather and the reopening of the Summerville Armory of the three divisions of the Rochester Naval Militia, comes the announcement of the installation of four sets of powerful radio equipment to be utilized during the summer activities of these units.

The Submarine Chaser 433, which was acquired last summer for training purposes, will be equipped this season with both sending and receiving sets. It was learned the sending equipment to be installed on the chaser will have a range of approximately 180 miles.

The receiving sets will be regulation DeForest honeycomb coil sets, of the two-step amplifier type, thereby giving them unlimited receiving range insofar as distance and wave length are concerned.

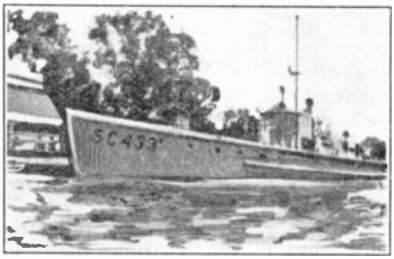
In this connection it was stated that the sending station to be consructed at the Summerville Armory will have a broadcasting range of more than 1,200 miles.

This equipment will be the most modern and up-to-date obtainable, and will mark a long step forward in establishing the Rochester units of the Naval Militia as being one of the most progressive and efficient body of men stationed on the Great Lakes.

The work of supervising the installation and construction of the stations on both the Summervile Armory and the sub chaser will be under the direction of Rudolph Schmidt, chief machinist's mate, Seventh Division and A. B. Frankel, electrician, first class, of the Second Division.

The first bit of radio equipment to be utilized by the Rochester Naval Militia units was in the form of a transmitting set installed in the naval headquarters, Rochester State Armory, a year ago last winter.

Since that time the matter of obtaining and installing more modern and efficient equipment has gradually progressed to the point now where the Rochester units will have the use of the very highest radio outfits on the market.



Sub Chaser 433

It will be recalled that on several occasions last summer when the sub chaser was on cruise, the possession of a radio sending set on board would have been of great assistance in overcoming difficulties which were encountered before the home port was reached.

On one of these occasions when the chaser was about to "shove off" from Olcott Beach on the last lap of its return cruise, it became necessary to take several parts from the auxiliary engine in order to make the main engines function properly.

The sailing time from Olcott Beach was set for 5:00 p. m. As a result of the repairs which had to be made the chaser did not leave Olcott until about 11.00 p. m.

After the chaser had been underway for a short time, making little progress because of the unusually

rough weather which was encountered, the carbureter on one of the main engines back fired and blew that most essential bit of mechanism into bits.

This resulted in another lengthy delay for repairs and the chaser finally limped into her home port on two engines about 2 o'clock the following morning. Because of the late hour the station man and his assistants at Summerville had retired, all lights were out and the sub chaser had to proceed with the utmost caution in tying up to avoid ramming smaller craft in the river, or colliding with its own pier.

Such incidents as these point out the strong need for efficient radio equipment. For instance, it is shown that a fire could have most easily resulted aboard the chaser when the carbureter back fired, imperiling the lives of every member of the crew. Another argument in favor of the installation of complete, modern radio equipment is the time which was lost in making repairs and which subsequently resulted in the late arrival at the home port.

With a radio sending set aboard the chaser the station man at Summerville and his assistants could have been informed of the delay and would have consequently been on hand to assist when the chaser entered the mouth of the river to tie up for the night.

However, with the installation of the proposed equipment for both the sub chaser and the Summerville station, it will be readily seen that such difficulties will be overcome in the future.

In this connection, it might be well to point out that there are several vacancies in the three Rochester divisions of the Naval Militia for amateur radio operators who desire to become more proficient in the matter of transmitting and receiving radio messages.

All young men of good moral character and capable of passing the physical requirements and who are more or less experienced in radio transmitting and receiving, are requested to communicate with the Rochester Naval Militia headquarters, Rochester State Armory, or apply there in person for further details in regard to obtaining special training in this work.

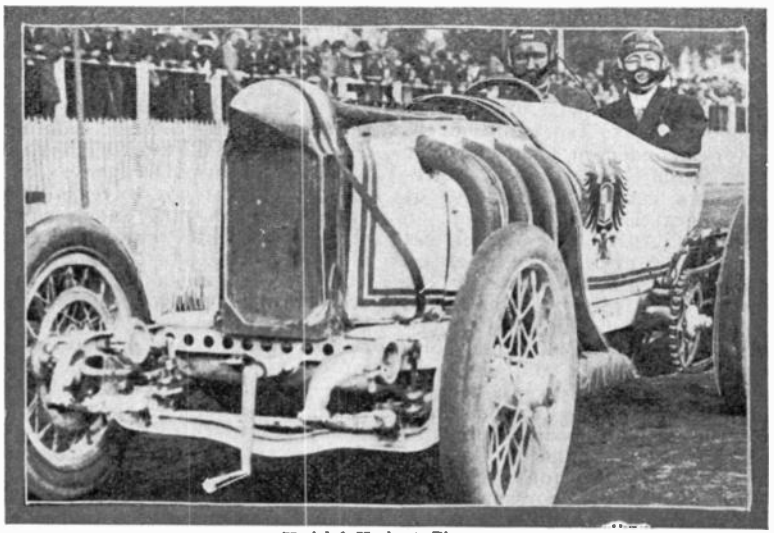
Radio Overcomes Break In Big Cable

During a recent break in the submarine cable connecting the army radio station at Fort Wood with the control and receiving station at Governors Island, the Signal Corps was able to maintain communication and the operation of the radio station at Fort Wood by use of two of the Signal Corps' latest type portable receiving and transmitting sets. This type of set utilizes a loop consisting of a single turn of three-quarter inch brass tubing for both transmitting and receiving and operates on a wave length between seventy and eighty meters, the same vacuum tubes being in use both when transmitting and receiving. The range of this set is about five miles and demonstrates the possibility of operating transmitting and receiving sets on wave lengths below 100 meters, as well as the progress that the Signal Corps is making in the radio field.

The attention of all men interested in radio work is invited to the numerous advantages offered by the Signal Corps for training and experience in the subject of radio, telephony and telegraphy. In this connection information is given that the authorized strength of Service Company No. 4, at Governors Island, has recently been increased, and this organization has several vacancies for men who would like to learn more about the subjects and would take an interest in the training offered.

Further information concerning the above vacancies may be obtained by communicating with the signal officer, Fort Jay, Governors Island, New York.

Racing Auto Equipped With Radio Phone



Kadel & Herbert, Photo

This is the first racing auto to be equipped with a radio phone. This is possible with the new Radio phone invented by Bernays Johnson. As this phone requires no aerials or grounds, communication with the grand stand and press box was easily carried on while the auto was racing around the track at a mile a minute clip.

The sensations experienced by inventor of the radio phone was described to various friends as the racing car was traveling at high speed. With this new wave no trouble is experienced from the electrical equipment of the auto and the speech was loud and clear at all times. This device will save many lives in the racing game for if a spill occurs all the other drivers can be notified and warned of the dangers ahead. In case of an accident one driver can notify the other of his trouble and thereby avoid accidents.

Bernays Johnson said after the test the entire weight of the complete apparatus is only ten pounds and all fits in a very small cabinet. The transmitters and receivers are worn in a helmet strapped on the driver's head. No tubes or complicated apparatus is used. Only a few special batteries supply the current. All those who witnessed the tests were highly pleased with the results, which will be a great factor in safeguarding the race drivers in the future

Photo shows Bob Burnam, the speed king in his Blitzen Bentz and Bernays Johnson, the radio phone inventor, with the new radio phone.

Eiffel Tower Wrecked

The Eiffel Tower wireless transmitting station was put out of commission by lightning when a bolt struck the antennae, a thousand feet above ground and the entire apparatus crashed to the earth.

The officials expect to have the repairs finished by Saturday. Meanwhile the tower is silent and thousands of radio fans will miss their daily broadcasting program and evening concert as well as the time signal which is given every noon.

Radio Pays Its Debt

In Restoring Happiness to Home of Dr. Alexanderson, Radio Returns Big Dividend to Electrical Genius

Radio has paid part of the debt which it owes to the genius of E. F. W. Alexanderson, chief engineer of the Radio Corporation of America and a consulting engineer of the General Electric Company.

Monday, April 30th, Verner, six year old son of Dr. Alexanderson, was lured from his home by the promise of a gift of rabbits and kidnapped. The police had practically no clues to work on; in spite of the active work and close cooperation of newspapers, police and radio broadcasting stations the case appeared to be at a standstill and the whereabouts of the boy remained a mystery for three days.

Bert Jarvis, of Theresa, Jefferson County, N. Y., a village of one thousand inhabitants, listening in Monday night on his home-made radio set heard WGY, the Schenectady radio broadcasting station of the General Electric Company, announce the kidnapping of Verner Alexanderson. Jarvis rents boats to fishermen and acts as caretaker for numerous summer cottages in the vicinity of Theresa. A few days before the kidnapping he had rented an isolated cottage to a man who was bringing his family up from the city for the season.

After hearing the radio description of missing boy and kidnapper, Jarvis's suspicions were aroused. Tuesday he met the owner of the cottage and asked him who had taken possession. The owner explained that it was only an old woman, a little boy and one man.

It so happened that the man, when renting the cottage, had said that he was going to bring his daughter. Jarvis's suspicions grew and Wednesday he decided to ride out to the vicinity of the cottage in his motorboat. He stopped at the cottage and asked the old woman who came to the door for a drink of water. He entered the house and saw a child on the bed. Jarvis returned to the cottage later and asked for candle-wicking for his motor. On this visit he waved to the boy and the boy waved at him.

Thursday morning Jarvis saw a photograph of the kidnapped child in the Syracuse Post Standard and this picture tallied with the boy of the cottage. Now sure of his ground, Jarvis reported to the Deputy Sheriff and a few hours later Verner Alexanderson talked over the long distance telephone to his father and mother.

The successful use of radio in the Alexanderson case has convincingly proved the value of radio broadcasting as a publicity factor when far-reaching results are desired in a short time. WGY announced the kidnapping within two hours after it had been reported to the police. Other broadcasting stations joined their voices to the voice of WGY and the story with descriptions of the missing boy and kidnapper went out over the entire country. Radio fans everywhere were enlisted in the search. The newspapers kept them posted on the progress of the case and also furnished them with pictures of the boy. Through Hudson Maxim the members of the Amateur Radio Relay League took up the case and hundreds of spark sets flashed the story through the air.

Dr. Alexanderson made a personal appeal from the Schenectady broadcasting station. After the boy had been found he again addressed the radio audience thanking everyone for their respective interest, sympathy and assistance. He placed special emphasis on the co-operation of press and police.

Dr. Alexanderson has done much for radio, the engineer feels that radio has more than repaid him for his work for it has restored happiness to his home.

Movie Shows How Concerts Are Broadcast

In a recently produced Mack Sennett comedy, entitled "Bow Wow," featuring John Henry, Jr., popular juvenile actor, there are several scenes, of which the above photo is one, showing the interior of a modern broadcasting station. John Henry, Jr., the boy star, is seen on the extreme right.

Selective Reading For Radiophans

There are thousands of persons in the United States who, in their daily life, are bestowed with spare time to devote to reading, but in many cases this time is not sufficient to use, in part, for a search of the best works of contemporary literature. With this fact in mind, the directors of Westinghouse Station KYW arranged during the medium of radio broadcasting, authentic advice on the selection of literature as a weekly feature of the stations' schedule.

As a result, the regular Thursday evening feature "Twenty Minutes of Good Reading," was devised by Rev. Claude J. Pernin, S. J., of Loyola University, Rogers Park, Ill. Rev. Mr. Pernin, who for many years has been dean of the department of English at Loyola and a well known authority on the short story, is well qualified to conduct this service. Because of his elocutionary abilities selective readings from the finest works of prose and poetry are now tuned in by thousands of radio fans throughout the United States and he has, through his unceasing effort, developed the feature far beyond the expectations of the station directors.

The popularity of this service is but another conclusive proof of the broadening influence of radio. The fact that the cowboy on the western plains and the New York banker both share in it, is sufficient evidence that, like the increased popularity of classical music developed by opera broadcasting, radio has instilled a love for better literature among all classes of society.

First Portable Radio Set Using Flashlight Batteries

A compact, self-contained portable radio receiving set requiring only flashlight batteries for the filaments of the tubes and weighing less than 18 pounds, has been perfected by the General Electric Company for the Radio Corporation of America. An outstanding feature of this set adding its portability and desirability for camping trips is the fact that the new radio trons, UV-199, are used which require only 60 milliamperes (.06 amperes) filament current per tube.

This new outfit, known as the Radiola II, will receive radio messages over a range from 200 to 600 meters for a distance as great as any set having a detector and one stage of amplification. It is housed in a mahogany cabinet with hinged front and rear covers. Head telephones with plug attached are clamped on the inside of the front cover. Provision is made in the rear cover for batteries in such a way they can be easily exchanged.

The set is so designed as to make a neat appearance in the home. The front cover can be easily detached.

Radiola II comprises a regenerative receiver with a vacuum tube detector and one stage of audio frequency amplification. The circuit is very efficient and will operate a loud speaker on signals received from nearby stations. With an additional amplifier, it can be used to secure loud speaker signals from distant stations.

For portable use the filament current is supplied from two 3-cell, 4½ volt flashlight batteries in parallel and the plate or "B" battery current is supplied by two 22½ volt batteries connected in series. For home use, when weight and portability are not essential, larger batteries both for filament and plate current can be used. For such use it is recommended that three 1½ volt dry cells in series be used for the filament and two larger size 22½ volt batteries in series be used for the plate voltage.

Line Switch Saves Charge and Tubes

Practically all filament rheostats are constructed with a zero point or "off" position which serves the purpose of a switch between the vacuum tube and the storage or A battery. However, it oftentimes happens that in the hurry of cutting off for the night, the rheostats are not turned completely off. Under these circumstances, the filament battery is left connected in the circuit discharging all night long through the resistance.

To prevent this, it is advisable to connect a separate battery line switch, which through practice and force of habit, should be opened first before the filament rheostats are turned back to zero. Then, if the latter operation is not performed, the battery circuit will be opened anyway by means of the line switch.

Rochester Radio Club

The Radio Club of Rochester is an organization composed entirely of the dyed-in-the-wool amateurs of Rochester and its vicinity. The club has done much toward reducing interference with broadcasting caused by amateurs. The local enforcement made by the members of the Radio Club states that no transmitting of any nature shall be done between the hours of seven and ten-thirty P. M. These hours have been set aside for the persons wishing to listen to broadcasting. The regulation is strictly enforced and all violators are taken care of by the Radio Club of Rochester.

During the summer the club meets the first Friday of each month in the Central Y. M. C. A. Club Room E, at 8 P. M. At the club meetings any violations of the silent period are taken up, the violators warned and if necessary further action taken to stop any interference by local stations. New radio developments, tests and other matters of interest are discussed. A paper is generally read by one of the members on some technical subject.

News from all Corners of the Earth

Wisconsin Baby Named W. G. Y.

WGY, the Schenectady broadcasting station of the General Electric Company has been honored by a Wisconsin family. A brand new baby, according to the father, has been named after the Schenectady station. He is Wallace Gordon Yadon and he lives in Delavan, Wis. M. E. Yadon, advertising manager for the Bradley Knitting Company, writes as follows:

"We have a baby called the 'radio boy' because we have named this child after your station, which indicates that not only the child is a favorite but that your station is our favorite. We only hope that you would broadcast twenty-four hours daily.

"The boy's name is Wallace Gordon Yadon. The receiving set has been placed at the hospital for the past five weeks and even the little fellow is getting so he can recognize his personal call letter WGY. We are proud of our son and trust that you will welcome what we think is your first namesake."

Latest Wireless Bell

German scientists, experimenting with the tendency of radio waves to follow telegraph and telephone wires, announce an invention that enables a transmitting station to call by means of a bell some individual receiving station or group of stations. It is not inconceivable that "answering the radiophone bell" will be included among the duties of the house.

Canary Song Concert

One of the most remarkable concerts ever given occurred recently when the Detroit station WWJ put six canaries in front of its transmitter and made them sing—and sing on schedule time, at that! A microphone was placed in front of the cages, which were not moved from the accustomed positions. When the programme was scheduled to begin a few notes were sounded on the piano and the tiny artists at once burst into melody.

"We have a canary," wrote in one fan, "that did not know it could sing until WWJ began. He looked into the loud speaker, twisted his head from side to side and then started out."

Life Boats to Carry Radio

Lifeboats on the Leviathan, America's greatest passenger liner, are being equipped with radio sets. Should the unfortunate occur and disaster befall the great ship, the survivors will be able to communicate with vessels sent to the rescue. The radio sets are as powerful as those on the average cargo carriers.

Rochester Youth Broadcasts

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.

Portable Camp Outfit For the Summer

With summer in the offing and the attendant waning in popularity of most indoor entertainment, the following article, written by James L. McLaughlin, manager of the J. Lawrence Hill Company radio department, should prove popular with fans. Mr. McLaughlin has constructed several compact sets for use on vacation trips and the one described below is one of the best.

This is the single tube Erla reflex circuit in which a crystal serves as detector and is the equal of two tubes, if not three.

The absence of detector amplification is more than compensated for by the increased resonance of the circuit as a whole and the double reflex effect secured, as comparative tests have amply demonstrated.

Regeneration consists of the plate current flowing from the detector back to the grid in exactly the same waveform, phase and frequency resulting in additional amplification. The disadvantage is that unless the conditions for regeneration as mentioned above are carefully controlled distortion and noise will result and will also cause radiated interference.

In reflex the radio frequency current is stepped up through a suitable transformer and detected by the crystal. It is then sent back to the tube and amplified at audio frequency.

In the Erla reflex circuit the problems peculiar to reflex amplification have been completely overcome. Through the use of a special transformer perfect stability is assured under all conditions.

The advantages of the crystal detector are a total absence of parasitic noise, freedom from distortion and pure retification. In this reflex circuit all points on the crystal will be found to give reception, but certain spots will be better than others.

To get the most out of this circuit a good amplifier tube must be used, such as the UV 201 or UV 201A. Very good results have been had with the WD 11 although the UV 201A was the loudest.

The construction of this set presents scarcely any difficulties. It is important that all leads be as short as possible. Use No. 18 or 16 soft drawn copper wire with an insulation of some sort in order that rough handling will not vibrate the wires and cause some to be shorted.

The Erla transformer is mounted in a vacuum tube socket to reduce the length of the leads.

The set is easy to tune, but sharp enough to eliminate undesired stations. A loop aerial can be used with good results for local reception.

The variocoupler is generally used with the coils not too close together and in some cases with both coils at right angles to each other.

To test the set for maximum amplification, lift the contact point of the crystal. When this is done the tube should go into violent oscillation to return to normal when the contact point is restored.

This is truly one of the most powerful single tube circuits ever built.

WHAM can be heard all over a space of 50 x 50 feet using a Baldwin type (C) phone on the end of a horn and stations such as KDKA and WGY can also be heard through the horn, but of course not so loud. Distant stations come in clear with whistling and howling.

First Station Songs

There are two station songs so far, WDAP, the Drake Hotel Chicago song, and the first, WOC, is composed by Jack Nelson, program director of WDAP. The official WOC song is a published ballad entitled "Station WOC of Davenport, Iowa—Where the West Begins." Words and music were written by Nat Ozmon, a song writer of Moline, Ill.

Scotch Songster Entertained With Song Program

The Radiocepters and others who tuned in on the program which was broadcast from the studio of the Radio Dealers Club on Friday evening, May 11th, will undoubtedly remember the variety of Scotch songs which proved to be a feature of the entertainment. Alfred J. Bowers, of No. 135 Primrose street, was the Scotch songster.

Photo shows Mr. Bowers as he appears in his Highland costume.

Alfred J. Bowers

Mr. Bowers takes particular pride in showing his friends the Harry Lauder cane, which he made himself, and which is a most essential item in his make up.

"I am willing to do my best at any time to entertain the Radio fans," says Mr. Bowers.

Radio Stimulated Him

Inspired by a talk he had just heard on the radio, given by Dr. William Alfred Sawyer, chairman of the health examinations committee of the Tuberculosis and Public Health Association of Rochester and Monroe County, a young man rushed into the health examinations in the veterans' bureau last evening about 9 o'clock and eagerly paid his one dollar fee for a diagnosis by the attending physician.

Three defects were discovered for him in connection with his vision, his teeth and one other. He was referred to his private physician for treatment, to a specialist for his eyes and to a dentist for the care of his teeth.

In his talk on the radio Dr. Sawyer stated that the time had passed when people waited until a tooth had a large cavity before trying to save it; that the up-to-date person had a dental inspection once a year.

He stated it was now coming to be the proper thing for a physical examination of the body to be given once a year and that a great deal of trouble would be prevented if this practice were followed.

Houdini Uses Radio

Manager J. H. Finn, of the Temple Theater, Rochester, received the following telegram from Houdini, known the world over as "The Escape King":

Orpheum Theater, Denver, Col.
Mickey Finn, Temple Theater,
Rochester, N. Y.:

Just learned by radio that employees are to have benefit May 18th. Am sending check for $100 for one gallery seat. While I will not be able to be with you in the flesh, I will be there in the spirit with all whistles blowing and all bells ringing.

Fraternally,
Houdini.

Receiving Set Replaces Band

A demonstration to test the reception of radio speech and music in the open air was staged at Wembley Stadium, outside of London, England. A program broadcast by station 2LO, London, was picked up by an eight-foot antenna on top of the stadium.

The lead in was attached to a receiving set, equipped with ten vacuum tubes and a loud speaker.

It is reported that people sitting on the topmost seats, on the opposite side of the stadium, 300 yards from the loud speaker, heard every sentence of the news bulletins as spoken at the broadcasting station twelve miles distant.

A striking part of the test was the reception of an orchestra. The music swelled forth as if the arena was filled with massed bands.

The receiving set was specially designed for use in parks and open spaces and it is claimed that it can easily take the place of a band if required.

Indoor Loop Limited

It is well to remember that an indoor aerial will not work for any distance with a crystal set so do not attempt it. A single wire about 100 feet long and as high as it is possible to get it, is the best aerial that can be used for receiving purposes. Three and four wire aerials will not help any in receiving, therefore, save money and time by erecting a single wire aerial.

Need License to Experiment

In an effort to encourage the scientific development of broadcasting and apparatus for that purpose, the Department of Commerce has created a new form of special license known as the "Broadcasting Development Class."

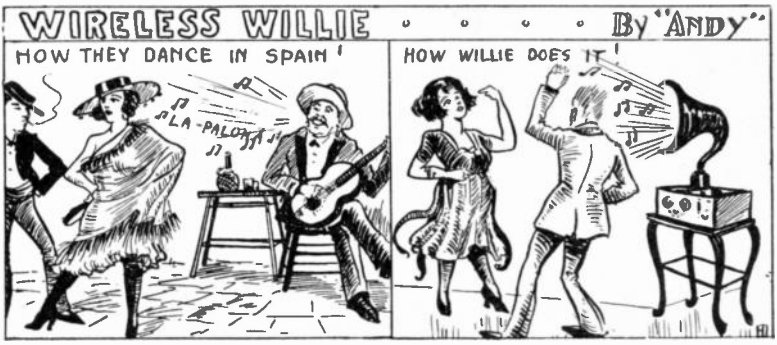
Licenses in this class will be issued to station owners having transmitting and receiving sets of their own design and manufacture, provided in duplicate where failure is likely to occur.

These stations are to be used for the improvement of broadcasting and many special requirements are demanded by the Commerce Department which will furnish detailed information upon application.

Baseball Over Radio

Baseball follows the flag. Wherever the U. S. Marines have been stationed abroad the lure of the national game has spread like wildfire. A radio dispatch from Managua, Nicaragua, reported the result of a baseball game played by the U. S. Marines against the native champions of that country, which the sea soldiers won by the close score of 5 to 4.

There are 33 Radiophone stations in the United States broadcasting religious services. The territory covered, it is estimated represents 65.2 per cent of the total area of the country.



KDKA Heard in England

KDKA, the pioneer radio telephone broadcasting station of the world and which has made radio telephone history since it was first started, November 2, 1920, by the Westinghouse Electric & Manufacturing Company, has been heard in Europe.

This information was conveyed in a letter written by Henry Field of Baggrave Hall, Leicestershire, England.

The letter follows:

Baggrave Hall, Leicestershire,
England, April 20, 1923.

Dear Sir:

It may interest you to know that I received several items from Station KDKA, on the morning of April 18th between the hours of midnight and 3 a. m.

(This would be 7:00 p. m. to 10:00 p. m. on the night of April 17th, your time.)

Interference from a High Power Press Station here rendered reception difficult but I heard your operator say the letters KDKA at about 3:00 a. m. (10:00 p. m. your time).

I have received WJZ regularly, WGY occasionally and WIP rarely, as well as seven amateurs.

I am using a tube CR-5 and 2-stage amplifier.

Yours sincerely,
HENRY FIELD.

Radio to Operate Trains

Radio power will run airplanes, trains and street cars—will be harnessed to engines of all kinds now propelled by coal, steam and oil.

Professor Hugh S. Taylor of Princeton so told the American Electro-chemical Society, during its recent convention.

While Professor Taylor made it plain that the commercial use of wireless power had not yet become a reality, he emphasized that when devices now being invented are perfected the world will see a scientific revolution. Electricity hurtled through the air at the rate of 186,000 miles a second, will be put to uses that almost surpass the imagination, he said.

Pastorless Church is Kept up by Radio

Rev. Paul G. Stevens, of the Presbyterian Board of Home Missions, reports the successful use of radio in pastorless communities in the West. As an example, at a frontier settlement 100 miles out of Los Angeles he set up a radio outfit, assembled a large congregation and all listened to a religious service for one hour broadcast from Los Angeles. The people listened with reverent attention not only to music but also to scripture reading, prayer and sermon.

Radio Set Operates On Automobile Trip

Kadel & Herbert

Radio is sure becoming popular for we find on making a trip through the mountains many of the vacationists with their radio sets right with them in the automobile.

Radio Co. Elects

The United Radio Corporation, Rochester, N. Y., manufacturers of Radio equipment and especially of the Peerless and Davis head phone, has chosen the following new directors: Selden E. May, Milton Bickford, Hugh Davis. The Board of Directors is now composed of these new members and the following: Ray E. Gleichauf, president of the Company; Alcott Neary, treasurer; Howard Case, Harry W. Edwards, secretary.

The United Radio Corporation was organized just a year ago. The headpiece, which is it's specialty, has found a very extensive market and the company is rushed to fill its orders.

John Henry, Jr., and Teddy Listen In

John Henry, Jr., and the famous dog, Teddy, who share honors in Mack Sennett's latest comedy, "Bow Wow," are shown killing a few minutes between scenes by listening in at the studio.

Best Station Awarded Cup

Frederick B. Ostman, Ridgewood, N. J., has been awarded the Hoover cup for the best amateur radio station, under the auspices of the American Radio Relay League board of directors. Announcement that Mr. Ostman's station, 20M, had been chosen as the winner was made by Hiram Percy Maxim, president of the A. R. R. L., at the league's headquarters, Hartford, Conn.

This trophy is the highest honor in amateur radio and is awarded by the Department of Commerce through Secretary Herbert Hoover to the best all-round amateur station, the major part of which is home-made. The entries are judged not alone on station arrangement of equipment, but on nine factors which the A. R. R. L. Board of Direction considers necessary in an ideal station.

The essentials considered in making the award include extent to which apparatus is home-made, ingenuity in design, construction and arrangement; efficiency of transmitter, consistent transmitting range, efficiency of receiver, obedience to United States laws and local co-operative regulations, quality of operator's sending, amount of traffic handled, accuracy, completeness and neatness of station log.

In making the award two other stations among the list of entries were considered particularly—2FZ, operated by F. Frimerman, of 740 Prospect avenue, New York, and 5ZA, operated by Louis Falconi, of Roswell, N. M. The latter was the winner of the Hoover cup last year. Any licensed amateur radio station in the United States or its possessions is eligible to participate in the contest.

Sunday Organ Recitals Are Becoming Popular

While more than 300,000 persons have been listening in every Sunday to the organ recitals being broadcast by Station WEAF, few of them realize just what type of organ is used, or the difficulty that had to be overcome to successfully broadcast organ music. This organ cost $50,000, has more than 3,500 pipes and forty-five stops, in addition to the French horn, chimes and harp.

Kadel & Herbert, Photo

The first photo shows William E. Zeuch, noted organist, at the console of the Skinner organ. Note the microphone.

Kadel & Herbert, Photo

The lower picture illustrates the manner in which the operator controls the various tones of the giant organ by the manipulating of this instrument. Organ music requires skillful operation and adjustment for soft, beautiful tones.

Neglected Aerial and Ground

Usually little thought is given to this end of the equipment. The receiver itself may be a beautiful job, carefully soldered and wired, but frequently the aerial is sadly neglected.

Here are a few things to remember. The aerial is best when stretched in a straight line or having not more than one right angle bend. Some beginners have restricted spaces for aerials and they think that by running the aerial in the form of a square all around the edge of the roof they will get better results. Others erect three poles on the roof and run a single wire in the form of a triangle. This is a waste of time and wire.

Run it straight away and not over 100 feet long. Remember that if it is too high it will pick up more static and if it is too low the signals will not be as good on long distance. A happy medium must be hit somewhere in between.

If it is not possible to erect the aerial all in one length and in the same direction, it is permissible to make a two or three wire aerial. However, it must be remembered that two wires each fifty feet in length are not the same as a single wire 100 feet long. There may be 100 feet of wire in the aerial, but the effective length will not be for the full 100 feet.

Be sure to insulate the aerial from all surrounding objects. If the lead-in wire comes into contact with any of the surrounding objects there will be a decided tendency for the current to leak off and for the best results, especially on DX signals, advantage must be taken of every little thing.

The ground connection is fully as important as the aerial, as it forms a part of the open circuit. The best ground connection is to the cold water pipe, as this is the shortest and most direct lead to the earth. The hot water pipes and the radiator system will do if

necessary, but there are many more joints in a system of this kind and as these pipe joints are made up with white or red lead there will be a high resistance, which is to be avoided. Scrape the cold water pipe until it shows a shiny finish and then use a ground clamp. Solder all connections in both the aerial and the ground for the best results.

Education By Radio Is The Latest

Radio broadcasting station WJZ and the New York High School co-operated in broadcasting the first actual radio tests ever attempted. Pupils took their examinations through the radio, the broadcasting being done by the officials of the Board of Education.

Kadel & Herbert, Photo

Photo shows the radio examination—testing the use of the computing machine (business arithmetic). At the RC receiving two stage set, is C. Bernhardt, while S. Nadelstein is taking the examination, with J. E. Mitchell, expert, checking up.

A 25-turn inductance has been satisfactory as a loading coil for the short-wave regenerative sets in order to pick up NAA on 710 meters.

Super-Station Opens At Aeolian Hall

Broadcast Central, the new radio station of the Radio Corporation of America at Aeolian Hall, New York City, which has been the subject of considerable speculation among radio listeners who have heard the station testing with call 2 XR, opened May 15.

Located in the heart of the city's musical and theatrical district, where entertainment of the highest order is ever available, this station offers to the American public the most elaborate radio programs with a degree of faithfulness in reproduction that marks the beginning of a new era in radio broadcasting.

The wires which tower 400 feet above the street on Aeolian Hall, at Fifth Avenue and 42nd Street, provide two antennas and this super-station will transmit two broadcast programs simultaneously on different wave lengths.

The closing of station "WJZ" at Newark, N. J., now operated jointly by the Radio Corporation of America and the Westinghouse Electric and Manufacturing Company, will coincide with the opening of Broadcast Central.

The well-known call "WJZ" will be retained for transmission from the Aeolian Hall station on 455 meters, while the call "WJY" will be used for the other wave length of 405 meters, both of which wave lengths have recently been allocated at the new station.

The new station is fitted with a double antenna and two independent transmitters which will permit a dual program to be broadcast, one, that of classical or serious entertainment; the other, popular airs, dance music and lectures.

The Radio Corporation of America has made a thorough analysis of the types of programs best suited to the requirements of the public and this study has revealed the fact that, generally, the radio public may be divided into two classes, those who prefer classical or similar entertainment and those desiring dance music and popular airs.

Not only will transmission be carried on from the two studios which are a part of the station,

but the main recital hall of Aeolian Hall has been connected to a switchboard in the station, thus providing at frequent intervals another source of the finest music obtainable.

To guard against interruption in programs, two spare transmitters are installed together with the necessary controlling apparatus which will enable the operator to make an instantaneous change from one set to another should any trouble develop.

Broadcast Central is a model station both in electrical design and operating facilities, incorporating the most advanced ideas of RCA engineers. One of the outstanding improvements is the "checking up" of the broadcast programs for clearness in transmission.

This is accomplished by a "moving picture" device connected with the antenna which shows at a glance the perfection in reproduction of music or voice as the radio waves leave the antenna. Any distortion occurring during a rendition may be instantly corrected by the operator who watches the electrical vibrations as they radiate into space.

How To Do It

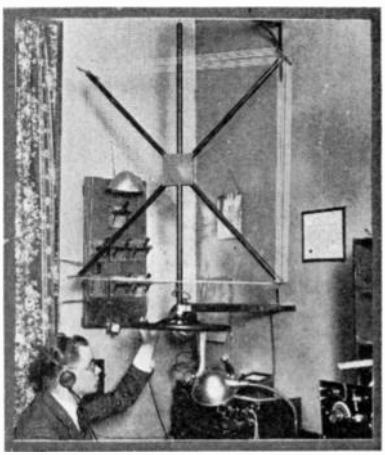
In building an ideal set it is well to remember:

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 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.
4. Place detector in the tuner. This will shorten up the leads.
5. Do all soldering with good, clean, hard solder.

At the Beach station, San Francisco, better reception is being obtained over loop aerials than has been possible heretofore when antennae were used.

Covers Great Distances By Novel Wall Loop

Now that summer is here and Old Man Static is getting busy again, the loop aerial is coming into its own, its directional qualities and the fact that it reduces static to a minimum makes it highly desirable for summer use, or in fact, for any time.



Kadel & Herbert, Photo

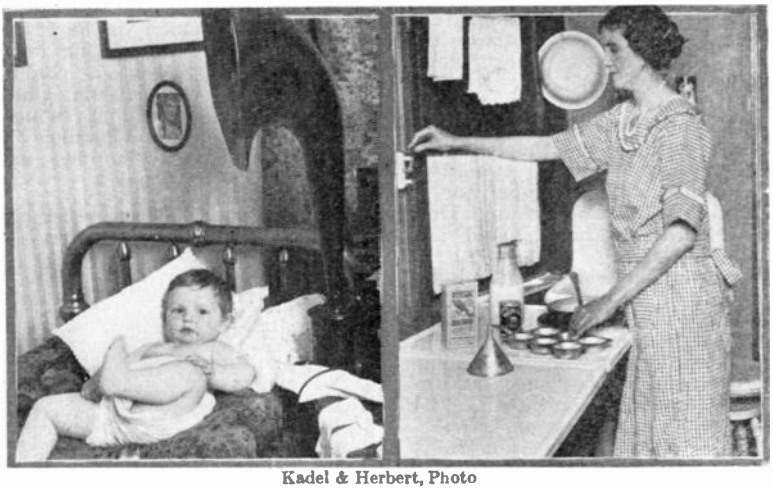
Wendall Kilmer, a New York amateur, mounts his loop aerial on the wall and turns it by means of an old automobile steering wheel. Photo shows Kilmer and his novel loop aerial.

Short Wiring

The reason for the use of short wiring and right-angle turns in connecting a set is a simple one. Every wire carrying an electric current has a magnetic field; if two wires are placed near each other, they will absorb current, but if placed at right angles they will oppose each other, which is just what they should do. If the wires are run long they will, of course, meet with other long leads, and there will be adverse inductions.

If you want to dispel those radio blues,
"Listening In," is the cure—you cannot lose.

Radio Lulls Baby to Sleep While Mother Does Housework



Kadel & Herbert, Photo

Mrs. Ralph Breslin, of No.157 West 106th street, makes use of the radio in an interesting as well as practical manner. To keep her eleven months-old baby quiet while doing her cooking and housework, she simply places her baby in bed and by means of a switch board located in the kitchen, she turns on the radio whenever baby is restless or begins to cry.

Photo shows Baby Ralph Breslin, eleven months old, very much interested in radio.

Speech is Broadcast Backward

Those who never heard English spoken backward listened to a demonstration by radio on March 30, when WGY, the Schenectady station of the General Electric Company, broadcast part of a Pallophotophone speech by reversing the film.

The Pallophotophone is an instrument which photographs or records sound on motion picture film. The film looks just like motion picture film, but the photographed image consists of a series of up and down lines of varying degrees of amplitude and frequency. Everyone is familiar with the result obtained by reversing the motion picture; falling buildings are rebuilt; the man jumping off the wall is seen jumping back when the film is reversed. The same thing occurs when a speech film is reversed, the speech is given backward.

Friday evening, March 30, WGY broadcast an address by David Sarnoff, vice president and general manager of the Radio Corporation of America, and also an address by Dr. Frank Crane, the inspirational writer. Upon the completion of the Crane address two paragraphs were broadcast backward.

How Do Weather Conditions Affect Radio Activity?

Neither wind nor rain have a bad effect upon radio transmission or reception; indeed, stormy weather is usually "good weather" from the point of view of the radio fan. Several common misconceptions on this subject are cleared up in the following article from an English correspondent:

What we commonly call good weather is not necessarily good weather for radio and what we commonly call bad weather is not necessarily bad weather for radio.

A dark, rainy day, for instance, is often an extremely good day for radio; indeed, it is during the stormy days of winter that most radio records are broken. The reason is that radio waves are entirely independent of air waves and of merely atmospheric disturbances.

Neither wind nor rain need have a bad effect on radio. The collection of moisture upon the insulators may cause a leakage of radio energy to the ground, but this is purely a mechanical fault that can be eliminated by the use of corrugated insulators.

Radio waves do not constitute an electric current which flows down to the ground on the first convenient conductor. If a wind is so strong as to shake the antenna it may cause difficulty in tuning, but that is the only trouble a wind will give.

The speed of the highest wind (one to two miles a minute) is so trifling compared to the speed of radio waves (186,000 miles a second) that even if an air wind could affect radio waves, the effect would not be appreciable.

There are three reasons why the conditions are not quite as favorable to radio work in summer as in winter:

First, the increased foliage of the trees brings about an increased absorption of radio energy, and this permits less of it to reach the actual antennas. Each tree acts virtually as an antenna, and the district becomes too "crowded" for good radio work.

Second, the brighter solar light in summer ionizes the atmosphere and causes a "dampening" of radio energy.

Third, there is more interference due to static in summer than in winter.

But even so, radio work can be carried on with success in summer. It is foolish to conclude that weather conditions at any time of the year can seriously interfere with radio. Last winter steamers off the coast of Colombia picked up American broadcasting from stations sometimes as far as 2,000 miles away! And the weather conditions in the tropics are infinitely more unfavorable all the year round than they are in the United States in summer!

Don't be discouraged about "summer radio." Take a set along with you on your vacation.

—*John Bulmer, in Popular Radio.*

Popular Universal Star

Roy Stewart, well known film star, spends many an enjoyable evening at home getting "an earful" of the day's activities throughout the world as they are snatched from the ether waves by his powerful receiving set.

Trio Use Radio On Auto

An artist, a journalist and a photographer, bound for the Orient, the land of mysteries and enchantments, where they are to seek first-hand knowledge of conditions as they really exist and thereby exchange ideas of eastern and western civilization, carry upon their automobile a complete radio outfit.

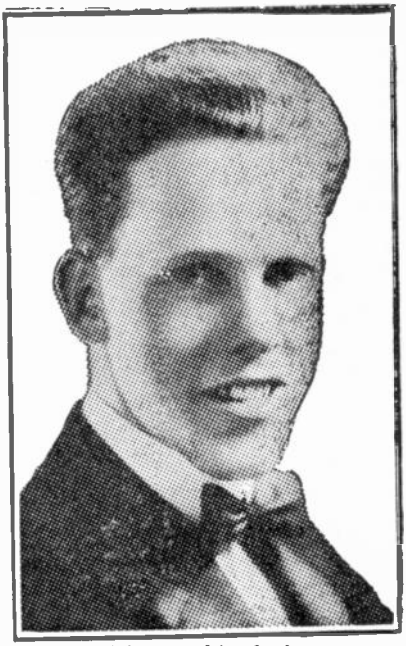
Miss Mildred Taylor, sister to the photographer, is the journalist.

The artist is Blanding Sloan, who besides being an artist is a dramatic critic. Peter Taylor is the photographer.

KYW Station Will Have Composer-Announcer

Wendell W. Hall, probably radio's most popular entertainer, is now a member of the announcing staff at Westinghouse Station KYW, where he had been previously a regular performer. For several years Hall has been a well known composer in Chicago having written such song hits as Mellow Moon, Pickinny Lullaby and My Dream Sweetheart. In addition to his talent as a composer of popular selections he is also an able artist on the xylophone, ukelele and slide whistle and sings in a pleasing tenor voice that has endeared him with all radio fans in the United States.

Hall probably is the first radio headliner to be developed and his name and voice are known by more radio fans throughout the country than that of any other entertainer. An amusing example of the proof of his popularity is shown in the following incident. While in KYW's studio one evening several months ago, he sang one of his popular selections and as he was not on the program that evening he asked that his name not be announced. He had no sooner finished singing when "listeners in" phoned the studio to have Wendell Hall repeat his selection.



In addition to his duties as announcer at KYW, Hall, who is popularly known as the "music maker" will also entertain the radio audience with his song specialties.

Safeguarding Antenna

When provided with proper safeguards, there is no more danger from the antenna being struck by lightning than there is from the telephone or electric light wires running into the house.

An antenna, properly grounded, serves as a lightning rod, gradually letting the static charges leak away to the ground before they have a chance to gather and attract an opposite charge from the clouds.

It is estimated that a radio antenna not only protects the house with which it is connected but the surrounding area equal to the size of a city block.

Renewing Dial Figures

Every amateur wants a neat looking panel, but in time the marks and numbers become darkened and yellow. This makes a panel look bad. A little white paint may be mixed thickly so that it is like a paste and then spread it over the figures on the dial. When dry the surplus may be wiped off with a damp rag, leaving the depressions full of white paint. —W. King Jenkins, San Francisco, Cal.

Its a tough world, they say, so full of knocks and sin.
Why not brighten up a bit, start reading "Listening In."

Swann to Broadcast

Ada Bessie Swann who recently addressed WJZ's audience on "Home Making a Business," delivered a lecture of her economy series "Home Making and Its Equipment," the evening of May 16 from WJZ's new quarters in the Aeolian Building.

ADA BESSIE SWANN

The fame of Miss Swann's teaching of domestic science in the Oranges, several years ago, attracted the attention of the public service officials who engaged her to initiate and superintend their Home Economics Department.

Miss Swann has constructive suggestions to offer on all phases of home making. She has appeared before Women's Clubs all over the State of New Jersey, their combined audiences totaling over 50,000.

Reinartz a Poor Man

One would think off-hand that the inventor of the Reinartz tuner, which makes radio reception easy for thousands of fans all over the globe, would be on the same quick road to fortune as the originator of the first Eskimo pie. Unfortunately, John L. Reinartz, in whose mind the famous tuner had its beginning, is still riding in a neighbor's Ford car.

Interest in the Reinartz tuner is at its peak at the present time and it is known wherever there are amateurs or novices.

Reports from France and England show that it is being used extensively in those countries. A correspondent writes that several are being used in China.

One seldom picks up a radio magazine without finding some mention of it. Radio fans are making these tuners by the hundreds and several manufacturers have begun to flood the market.

The woods are full of tuners and everybody is deriving some benefit except the inventor.

What "Kilocycle" Means

Since the Second National Radio Conference met in Washington much has been heard about the word "kilocycle." If the speed of Hertzian waves, 300,000,000 meters a second, is divided by the wave length the result is the frequency in cycles. A kilocycle is 1,000 cycles.

It has been found that a good way to rate radiophone stations is according to their kilocycles frequency because it is the difference in this frequency that will permit the listener to tune one station in and another out.

Another reason for this separation is to prevent audible heterodyning, that is, "beat notes," which result when the frequency of one station is too close to that of another broadcasting station.

When a difference below eighteen kilocycles exists between two stations the beat note is generally heard by most listeners.

The new regulations require that each station keep within two kilocycles of their assigned waves. The 360 meter wave length is equal to 833 kilocycles. The 400 meter wave length is equal to 750 kilocycles.

U. S. Army In Field Depends Upon Radio

Efficient communication in the Army is coming more and more to depend upon radio and in order to keep abreast of its development, the Signal Corps of the U. S. Army maintains a complete radio research laboratory at Camp Alfred Vail, N. J. At this modern laboratory, the development of new and special apparatus for the several arms of the service is planned and perfected. A number of America's foremost radio engineers are engaged upon radio problems. A radio school for military students is also conducted at Camp Vail, where men from the different corps are trained as experts.

Functions of the Signal Corps do not comprise radio communication solely, but include all means of signaling from visual, through the pigeon service, line telegraphy, cables, telephone work including field service to the latest methods of radio communication. The Signal Corps also include a meteorological and electric time services.

In time of war, a Signal Officer pointed out recently, victory or defeat has sometimes hung upon the transmission of a single message, and the importance of communication is so great that no engagement can be successful without a well-planned system of communication.

In the Army, efficient communication systems are maintained in time of peace as well as war. This makes it necessary for the Signal Corps to keep up-to-date, and, when possible, to be a little ahead of the times. Many commercial devices and systems now used were originated in the Signal Corps for military use long ago.

Today a network of radio stations extends to all quarters of the country, with a message center in Washington. High powered stations carry dispatches from coast to coast in record time and no military command is out of touch with Washington for any appreciable length of time.

The installation of a system of modern, vacuum-tube stations connecting all centers of military activity has been practically completed. For the transcontinental circuit, stations have been established at New York, Washington, Indianapolis, Omaha, Salt Lake City and San Francisco, with one nearing completion at Cheyenne.

Similar stations have also been installed at Atlanta and St. Louis. In addition, all the important Flying Fields will soon be connected with the radio system. Most of the big stations are equipped with apparatus permitting the reception of incoming messages by loops and six stage radio-frequency amplifiers.

Communication is maintained through these sets by means of the continuous wave telegraphy, but the stations are also equipped for radio telephony and buzzer, modulated radio telegraphy.

The importance of radio to an Army in the field was shown during the operations of the First American Army in the Meuse-Argonne battle, when six hundred radio receiving sets were used for receiving airplane reports alone.

The operation and maintenance of these sets required the services of about five thousand radio specialists, most of them recruited from the ranks of American amateurs at the outset of the war.

Radio communication between infantry regiments and battalions is the most important link in action. Front line wired telephone and telegraph communication is constantly interrupted by shell fire and bombs.

With the exception of brigade to regiment communication, which is spark radio, all ground radio within an American field army is now of the vacuum-tube or continuous-wave type.

There's more than one way to skin a cat,
But if you read "Listening In," you won't have to do that.

We're open to suggestions that are fair and just,
And in the meantime, just watch our dust.

Heard Over Our Radio

In Which Our Office Force Gets Radio Razzed

A few days ago we hired a new "stenog", one of whose duties is to answer the 'phone. She is a rather pretty girl and blushes quite easily, becoming confused at the slightest mistake made.

Well, to make a short story long, the little "stenog" picked up the receiver at her first 'phone call and said in a rather shaky voice:

"LISTENING-IN"

"Then get off the line"! ejaculated a gruff person at the other end, causing the "stenog" to drop the 'phone.

After several such calls she learned to put on "the cold shoulder", so when a rather fresh salesman came in the other day and asked if May was in, she fired back:

"May who?"

"Mayonnaise," was the quick reply.

But not to be "out smarted", as it were, the "stenog" fired pertly back:

"Mayonnaise is dressing."

We were listening to a program over the radio last Thursday. Half way down the program the name of Mr. Bert Brown figured.

When the time came for him to "do his stuff", the speaker announced:

"Ladies and gentlemen, I have to announce that Mr. Brown will be unable to sing and therefore Mr. Green will give us 'A Song of Thanksgiving.'"

Through some mistake somewhere a radio sending set had not been shut off after being used and because of which we heard the following over our radio:

"James, haven't I told you to knock before entering? You almost caught me partially undressed."

"But madam", was the reply, "I always look through the key hole first."

The Boss noticed the new business clerk had taken time off to get a hair cut, so when the clerk came back he was asked:

"Do you mean to say you got a hair cut on the firm's time?"

"Sure", returned the clerk, "it grows on the firm's time, don't it?"

It was warm in our office the other day. The windows were wide open and the little old radio was crackling from the static filled air.

Andy, who draws Wireless Willie, was doing a little experimental work. After several minutes of snaps and bangs, a thin, far away voice was heard to say:

""Tis a fine kid ye have. Oi saw him the other day. A magnificent head and noble features. Could you lend me a couple of dollars if oi calls for it?"

Several minutes later we heard:

"I could not! 'Tis me wife's child by her first husband!"

From one of our reporters we heard the following joke being circulated in the radio world around Rochester, our home town.

It seems a certain radio speaker of a certain local station had become so accustomed to his avocation of announcing programs and signing them off that one night his wife heard him say:

"—and Lord, bless my wife and children, amen; this is Ruddy signing off."

One of our advertising solicitor friends tells us his wife is the limit. Only the other day, he says, she called him on the 'phone and asked him to bring home a mouse trap.

When he told her that only two days before he had brought one home, she returned:

"But, Frank, that one is already full!"

"Listening In," is the amateur's best bet,
It smooths all his troubles, he don't have to fret.
If you want to build a set and don't know where to begin,
Just ask the newsboy for "Listening In."

Radio Reception Simplified To Telephone Subscribers

Radio reception has been greatly simplified in Backus, Minn. If the Backus resident is a telephone subscriber, he just takes the telephone receiver from the hook and the music, drama, sermon or lecture pours out.

He has no need to worry about run down batteries, weak tubes, the intricacies of hook-up or the length of heighth of his antenna.

Miss Anna Ozier, chief operator for the Backus Telephone Company, recently wrote WGY at Schenectady, as follows:

"We have a receiving station here and by putting the loud speaker close to the transmitter and connecting up the farm lines, I have a system now by which the subscribers on our farm lines, who have never had an opportunity of getting concerts direct from the air, have passed many of their evenings enjoying themselves by turn and turn about at the telephone.

"I know of several cases where three or four persons have listened-in on the same receiver at once. In one case I was materially recompensed by a lady who was so much pleased by the concert and the part she thought I took in it, that she brought me a dozen eggs."

Reason Radio Distorts The Voice

Why do not voices over a wire or in radio sound like real people while musical notes over the same instrument are frequently produced with the utmost fidelity? To understand why this problem is hard to solve we must know a little about the nature of sound waves.

Sound consists of condensations and rarefactions in the air, or waves vibrating in the direction in which they travel. They would look like ripples about a falling stone in a pool of water if we could see them, except that instead of being circular on a level surface they are spheres in the substances of the air itself.

Musical notes are simple vibrations, but noises are complicated, like water waves that are churned in every direction. Here is a device that will enable you to "see your voice":

Tie a thin sheet of dentist's rubber over the mouth of a cylindrical lamp chimney. In the other end fit a cork provided with two holes Run a gas hose into one and from the other run a tube to a special burner.

To make this burner you will require a glass drinking tube. Melt the tube slightly in a gas flame and when it is fairly plastic, light soft wax, draw it out to a fine capillary tube. The finer the hair tube is the more sensitive your flame will be from the jet. Now mount a mirror on a spindle so that it can be turned at a fair speed. Connect the gas and light the flame at the jet.

Talk against the rubber diaphragm. Do you see the flame dance up and down? Look at this reflection in the rotating mirror. When you speak the band of flame seen there breaks up into a pattern of jagged saw teeth.

Now sound a musical note against the diaphragm from the purest toned instrument you have. Notice how much simpler the note is than your voice.

In telephony, as in other mechanical arts, simple patterns are much less liable to defects than complex ones. The diaphragm in a receiver can vibrate easier to a simple sound than to a complicated one.

In voice transmission sound waves must be converted into electrical waves, sent in that form to their destination and then decoded into sound waves again.

Sounds are converted into elec-

RADIO in Filmland

Lila Lee, tuning-in for "The Message" seen in her new Famous Players' Production

Leatrice Joy, Famous Player Star, listening in while relaxing between scenes

Louise Fazenda, T. Henry, Jr. and Mack Sennett's Bow Wow

Marshal Neilan directing large mob scenes by radio.

Part of a Radio Concert. Missed by the fans, Miss Andree Anspi rehearsing new steps by Radio

Mae Busch Star in "The Christian," an enthusiastic Radio Fan.

Pola Negri, evidently getting an 'earful'?

Radio apparatus used in Marshal Neilans studio

E.C. Rundquist adjusting W.J.Z. for 455 meters at opening of new W.J.Z.-W.J.Y. Radio Station at Aeolian Bldg. N.Y.City.

Jack Holt, Famous Players Esquire, "Plucking" entertainment from the air.

The Mystery Of The Weird Music

There arises nights in the vicinity of Western New York eerie noises. Upon investigating, farmers find—

Mirandi and Si are seated on their front porch. The night is quiet—only nature murmurs. Occasionally a cow moos in the pasture. In the barn, the horse neighs and a startled chicken squaks.

From left to right, Clifford A. Culver, Robert F. Pulver and Elmer L. Wheeler.

Suddenly the silence of the night is broken by a weird noise, wailing over the country side. Mirandi and Si look at each other. The noises grow louder, rousing each woodland animal, each farm yard pet.

The cows move restlessly. The horse pricks his ears; the chickens are motionless with fright. An owl who-o-os and a lost bird flutters away into the night.

"What is that?" whispers Mirandi.

"Don't know," returns Si. "Appears it comes from the center of the village. Let's investigate."

Hitching up the ol' horse, Mirandi and Si drive toward the eerie sounds. As they approach the village the noises in the air change gradually to music.

Broadcasting Their Wares

Pan, god of the country, has observed peddlers selling their wares since back in early Greece and Rome when the blind and the crippled hobbled from house to house peddling trinkets for a living.

And down thru the ages the farmer, good old agriculturist, has bought of these peddlers—from the tin-pan merchant to the panhandler of shoe laces.

It is because of the distance he must travel to the big cities that the farmer tolerates these peddlers and is hospitable to them, more so than his city cousin.

Another Character in the Plot

Realizing the fact that the modern agriculturist has little time to saunter in and out of shops purchasing necessities and amusements, Robert F. Pulver, an expert and retailer of radio, living in Rochester, goes into the land of the farmer to sell.

And like his ancestors in the market places in Greece and Rome, he announces his wares—but not by mouth as the modern barker. Rigged up in his Ford Delivery is a radio set capable of receiving distant stations

Nightly, he drives the little Ford into the country, in the vicinity of Western New York and locating at a suitable place, he tunes in on a concert or two.

The Plot Thickens

The set is a Federal, having seven tubes, one stage of radio frequency, a detector, a two audio-frequence and three stages of power amplification.

The set is in a cabinet located inside of the Ford, ingeniously hooked with springs that absorb shocks of bumpy roads, the set has traveled twelve hundred or more miles.

With the aid of a loop antenna in his car, the young operator can tune in on any station in the United States Often he hooks his ground to a gas station in the

(Concluded on page 37)

tro-magnetic waves by a transmitter. A telephone transmitter consists of a box of carbon grains, each granule about as big as a crystal of sugar, against which the diaphragm vibrates. As the carbon is alternately compressed and released a continuous current is taken up into waves.

In radio the carbon cup is not altogether practical. When the waves from such a transmitter are amplified there are cracking noises due to minute arcs between the grains. Two sheets of metal foil, acting like opposite condenser plates, produce purely induced currents in the transmitting circuit and have proven themselves to be the better form.

A radio receiver is much more sensitive than a telephone receiver and can accommodate itself better to complex tones. But in both the telephone and radio there is a tendency on the part of the instruments to slur over the subtle overtones that really make the voice and hit only the high spots. Music has fewer overtones and is easier to reproduce than voice over radio. A telephone receiver diaphragm is so stiff, however, that it slurs even musical notes.

A good telephone or radio voice is one that speaks with as few complex tones as possible. Have you ever heard that kind?—Syracuse Post-Standard.

Plans Radio Route

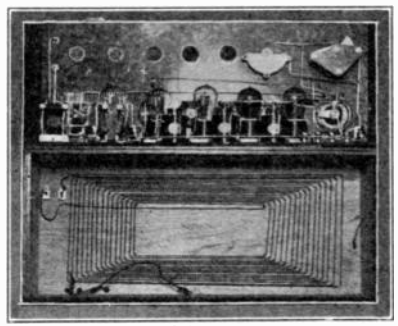
Plans of the British government for an all-red radio route between London and the empire beyond the seas include provision for cheaper rates; high power stations for communication between London and the Dominions and an expenditure of between £5,000,000 and £6,000,000.

The program includes the erection of five high-powered stations on a site not far from London, a principal transmitting station in South Africa, India, Australia and three in Canada together with a number of smaller receiving stations in each Dominion.

The smaller colonies such as the West Indies, will be linked up with the nearest large station and there will not be a part of the empire with which people will not be able to communicate from London instantly.

Latest Loop Aerial

Rear panel view of the newest of compact radio receivers, designed and constructed by Rutledge Mayo, of New York. Using three stages of radio frequency, detector, two stages of audio, it uses a two circuit jack, enabling the operator to use the outdoor antenna or the loop-aerial contained within the set.



Kadel & Herbert

The aerial is hidden from view when the set is closed, and Mr. Mayo has received over a 1500 mile radius, using the loop only, with earphones. The upper part fits inside of the cabinet, it is shown standing on and the loop is made of No. 38 strand wire—12 turns.

On our list of broadcasting schedules we find "6:00—Dinner Concert by WBZ Orchestra." We can have real orchestra music for dinner at home and do not have to wind up a victrola after each selection.

What would a "Super" circuit with a UV-203, 50 watt tube, sound like?

This edition of our magazine is called the flivver issue. There are several flivver circuits and outfits described in the Radio Builder section and the Amateurs Round Table.

WJZ—WJY

Being a Description of the New Broadcasting Station Opened in Aeolian Hall

By Edward T. Eastman

May 15th was a day of great events in Radio history. Besides the fact that many broadcasting stations changed their wave length, WJZ ceased to be at Newark and its operating force moved to the new station at Aeolian Hall.

The old station at Newark, one of our earliest broadcasters, gave us many evenings programs of high class music by the artists available from New York City.

Kadel & Herbert, Photo

Interior of New Studio

How wonderful was the impression on some of us while listening in February 1922 and heard the announcer say, "Orchestra Music from Hotel Pennsylvania, New York City."

So WJZ completes a successful period of broadcasting several months over a year at the old stand with only a few breaks in their program such as recently when the storm and wind damaged the aerial to such an extent that it was impossible to send out the program on which Frieda Hempel was to sing.

The new station at Aeolian Hall will be known as "Broadcast Central." It is equipped with a double antenna 350 feet above the street and two independent transmitters which will permit a dual program to be broadcast on different wave lengths, one of classical or serious entertainment; the other a lighter program of popular airs, dance music and lectures.

The call WJZ retained for transmission from Aeolian Hall on 455 meters and a new call, WJY, is used for the other wave length of 405 meters The power is rated at 500 watts.

The station will have two studios

so that classical and dance music can be broadcast simultaneously. The main recital hall of Aeolian Hall will be provided with a microphone so the recitals can be a source of entertainment to the radio audience.

To guard against interruption in programs, two emergency transmitters have been installed with the necessary controlling apparatus which will enable the operator to make an instantaneous change from one set to another should trouble develop.

The two studios will each have separate reception rooms on the sixth floor of the Aeolian Building. The jazz studio and its reception room will be decorated in colors which blend harmoniously with that type of program. The classical studio has draperies of royal purple and is furnished sedately throughout. The walls and ceilings of the studios are covered with felt and muslin and the floors are heavily carpeted to prevent echoes.

Kadel & Herbert, Photo

Novel Microphone

Based on the fact that radio entertains the world, artists at Broadcast Central on top of Aeolian Hall perform before a sensitive microphone concealed in a sphere or globe atlas of the world made of thin gauze. The seas are reproduced on its surface in deep green and the continents in tan. The globe is about twenty inches in diameter and stands on a mahogany pedestal. No mouthpiece is needed, since the delicate texture of the gauze permits the sound waves to easily penetrate and reach the microphone concealed within. From here the music or words are carried over wires in the form of electric currents to the control room, located between the studios. At that point the speech amplifiers magnify the current before it travels through heavily shielded cables to the operating room on the roof, twelve floors above.

Many radio entertainers say it is difficult to perform in a sound proof radio studio where there is no evidence of any one listening and no applause can be heard to give encouragement. The new microphone arrangement at Broadcast Central will help the entertainers to visualize their audience as they sing, play and speak into the globe which absorbs the sounds similar to the way millions of antennae pick up the concerts throughout the world.

Many have wondered if the buildings in the vicinity of Times Square would have a bad effect upon the Aeolian radio concerts by absorbing the radiated energy. Engineers in charge of Broadcast Central expect no trouble from this source. They point out that the only danger from such an effect is in absorption by the building on which the antenna is located. Once the energy gets away from the station other steel structures in the vicinity have no marked effect. Sometimes a building on which a station is located is just the right size to be in "tune" with the radiated wave and such being the case much of the power radiated is absorbed by the building. Aeolian Hall seems to be well adapted to hold aloft a radio station, for the test signals have already been picked up in Texas.

To the east of Aeolian Hall there

Continued on Page 42

(*Continued from page 34*)

country and gives a concert to the tune of gasoline filling his tank.

The Mystery Solved

Because of the high power of amplification, Mr. Pulver's loud speaker, on top his gas buggy, is heard on still nights two miles away!

Thus when Mirandi and Si heard strange noises rising in the still night, they found, upon entering the village, a crowd of other curious villagers and farmers who also had come to investigate the weird noise, gathered around the set, "listening in" to music from down in Florida way.

And after a concert, young Robert Pulver, who is located at 50 Dewitt Street, Rochester, N. Y., gives a short talk about radio, passes out his card and sells a set or two. And thus ends the mystery of the weird music.

Amateurs Lose License

The department of commerce recently suspended the license of a number of amateur operators for violation of the act of August 13, 1912, section 4, regulations 3, 4 and 15. Similar action may be taken against any other operator reported for violation of the radio law. The above-cited regulations read as follows:

Regulation third. At all stations if the sending apparatus, to be referred to hereinafter as the "transmitter," is of such a character that the energy is radiated in two or more wave lengths, more or less sharply defined, as indicated by a sensitive wave meter, the energy in no one of the lesser waves shall exceed 10 per centum of that in the greatest.

Regulation fourth. At all stations the logarithmic decrement per complete oscillation in the wave trains emitted by the transmitter shall not exceed, two-tenths, except when sending distress signals or signals and messages relating thereto.

Regulation 15. No private or commercial station not engaged in the transaction of bona fide commercial business by radio communication or in experimentation in connection with the development and manufacture of radio apparatus for commercial purpose shall use a transmitting wave length exceeding 200 meters, or a transformer imput exceeding one kilowatt, except by special authority of the secretary of commerce contained in the license of the station: Provided, That the owner or operator of a station of the character mentioned in this regulation shall not be liable for a violation of the requirements of the third or fourth regulations to the penalties of $100 or $25, respectively, provided in this section unless the person maintaining or operating such station shall have been notified in writing that the said transmitter has been found, upon tests conducted by the government, to be so adjusted as to violate the said third and fourth regulations and opportunity has been given to said owner or operator to adjust said transmitter in conformity with said regulations.

Operators are also warned that any change in the characteristics of the radio apparatus or service of their station must be authorized by the secretary of commerce as required by regulation 70. This authority is given in the form of a new license showing the new characteristics of the station.

The Amateur.

Lets get this right. An amateur is a person interested in radio who is not engaged in radio operating for pay but who holds a government licence as an amateur operator which permits him to operate any private transmitting station for other than financial reasons.

A radiofan or radioceptor is a person interested in the reception only of music, speech, etc., for personal reasons and use.

Its handy in size, cramned full of newsy features, easy to read and profusely illustrated. What is it? "Listening In."

Modern Miracle of Broadcasting Opera

A Trip Behind the Scenes of Broadcast Station WJZ

By Lloyd Jacquet

To the radio fan, comfortably receiving a concert or an opera from a station hundreds or even thousands of miles away, little is known of the wonderful mechanism behind the scenes.

Concerned primarily with the tuning and adjustment of his receiving set, he little realizes the skill and knowledge which brings about this modern miracle—"opera in an easy chair."

Early in the month of March, the Wagnerian Festival Company, just arrived from Germany, began a series of the popular Wagner Opera in New York City.

The broadcasting of these operas by radio was to be not only a test of the popularity of opera broadcasts as far as the fans were concerned, but also a test as to whether radio broadcasting would have any influence upon the theater box office receipts.

The Wagnerian Operas are very long. They range between three and four-and-a-half hours. They are also noteworthy for their large choruses and their long and ponderous overtures. It will be readily understood, then, why the feat involves some big problems and contributes a real test in broadcasting.

Station WJZ was unusually well situated and equipped to attempt such a test. It is the oldest station in the Metropolitan district, and has been completely overhauled. It has a power output of 1 KW. and has an extreme range of several thousand miles.

Engineers and operators at the station were well qualified to attempt the experiment, which was looked upon as an impossibility by many. How successful it proved to be is told in the comments of the press throughout the country.

The WJZ staff were experienced in "picking up" work. That is, it knew from experience how to pick up signals which were to be sent over wire to the broadcasting station for transmission from there. It will be remembered that many of the reports of football and baseball games were sent out via WJZ.

While the general principle is the same with the broadcasting of operas, the latter process entails a nicety of adjustment and operating which can be carried out only after exhaustive study of the problem by men of experience.

The problem was tackled with typical aggressiveness and on the evening of February 20th, practically without notice except for the brief opera synopsis by the announcer, "The Flying Dutchman" was presented to a startled and agreeably surprised radio audience.

The success of the first broadcast was such that it was quickly followed by the presentation of "Die Walkure," "Die Meistersinger," "Lohengrin," "Tannhauser," and others. These operas were picked up in Cuba, in far points of northwestern Canada and in Bremerhaven, Germany.

The success of the experiment was assured. Radio broadcasting of opera was accepted and applauded by the radio fan. It was another victory for the oldest station of this part of the country, the Westinghouse station WJZ in Newark.

Let us go behind the scenes in broadcasting. The mechanism which converts the sound waves into electric impulses and conveys it to the listeners' apparatus is comparatively simple, but very interesting.

A typical case is the installation for most popular of the Wagnerian operas—"Tannhauser"—from the Lexington Theater in New York, via WJZ on March 15, 1923.

Before the performance, the microphones which are to pick up the

sound vibration are carefully located and placed. A knowledge of the stage acoustics and of the opera is very necessary.

The microphones, three in number, must be so located as to pick up every sound made, either by the orchestra, soloists, or choruses. They must be judiciously placed so that the sound will not be too strong, or too weak, as the actors move about.

One of the microphones is placed under the stage, in front of the prompter's box and facing the orchestra and audience, in the orchestra pit. This instrument will serve to pick up the orchestral music. Two microphones are placed to the right and left of the prompter's box

Occasionally these microphones are moved to the wings, or to some other place more advantageous acoustically. Sometimes special "pick-up" horns are fitted to the microphones in the case of solos or subdued singing.

These microphones are connected to a small control switch box and by means of switches, either microphone, or all of them may be connected in circuit. This permits the control of any one of the microphones and the picking up of sounds on any part of the stage, as the opera progresses and requires.

From the control box, the impulses picked up on the stage are sent through a speech amplifier, which is usually located under the stage. In the cabinet are placed the usual transformers, tubes and repeater tubes necessary for amplifying the weak impulses before their journey to the broadcasting station.

Energy for the speech amplifier and microphones is supplied by a unit of four 6-volt storage batteries, from which connections are made to the various controls. The output from the speech amplifier is fed into the Western Union wires, which connect directly with the station.

In its journey from the theater to the station, the electrical impulses go through underground conduit, pole and underwater ducts and pipes, and again via poles to the Westinghouse Electric plant in Newark, N. J.

On top of the manufacturing building, which is situated not far from the Lackawanna Railroad station, are located the operating and transmitting rooms and the aerial and counterpoise systems.

It is to the control switchboard in the transmitting room that the impulses from the theater come. Here they are amplified again, because they were weakened in their underground, submarine and air trip before they reached their first stop on their lengthy journey.

By means of the station voice amplifier and of the intermediate modulator tube, the original electrical impulses picked up on the stage of the opera house are magnified so that they can now be supplied to the five powerful modulator tubes, of 250 watt rating each.

This energy which is perfectly modulated goes to the oscillator tubes. These four tubes supply 1,000 watts of energy directly into the radiating system. A pickup coil located near the transmitter switchboard permits a check on the modulation.

Direct communication by telephone with the announcer in the theater is useful for an exchange of information on adjustments on both ends which will result in perfect broadcasting on the subject.

From the huge antenna and counterpoise system, the radio waves radiate for thousands of miles in all directions, to be picked up by listeners in every land.

The experiment of broadcasting opera music was interesting technically and from a musical standpoint. It was long a doubtful thing as to whether it was possible to transmit operas by radio. Because of the various effects, both climatic and of delicate tone coloring, the problem, from a technical standpoint, was a difficult one. However, the radio engineer has succeeded in solving the problem. And the musician agrees that he has solved it well.

Underground Radio

Radio Engineer Says Ether Waves Penetrate the Ground and Travel Through the Earth

Herbert E. Metcalf, a radio engineer, tells in The Mining Congress Journal how mining disasters can be averted and mining camps put in touch with the outside world and the expense by wire partly saved by the installation of radio. Communication through the ground has already been proved feasible, he says and altho further investigations are called for to determine the most practical type of apparatus for this particular work, there is no doubt that in the future radio outfits will be a common accompaniment to every up-to-date mining plant. He continues:

"Radio waves do penetrate the ground and do travel through the earth much the same way as they travel above the ground. There are, however, certain limitations which tend to absorb the power of the transmitting set when sending underground, but due to the increase in efficiency and sensitiveness of receiving sets, it may be stated with authority that no difficulties are encountered in sending messages from the surface to the bottom of the deepest mine unless perhaps the receiving set in the mine is surrounded by a high metallic content iron ore. Even in the latter case, power could be increased at the sending station so that sufficiently loud signals could undoubtedly be received under the most adverse conditions likely to be encountered. The above remarks apply principally to receiving below from a sending set above. The reverse—sending from below to be received above—is a little more difficult, especially in metallic ore mines.

"The problem of reception below the surface of the ground, and, in fact, below the surface of the water, has been well investigated. The writer recently read a report of reception at the bottom of a 1,200-foot mine with a narrow shaft using only a 3-foot loop of wire as a means of catching the messages, where readable signals were readily obtained from a sending station in Germany and many stations in this country were copied as well. The apparatus used in these tests was standard equipment, such as used above ground for loop reception and no particular attention paid to the portability of the receiving station, or its adaptation to permanent use in mines.

"Reception below the water was thoroughly worked out and made practical during the late war for the use of submarines and it may be stated that accurate and distinct communication was obtained in practise to and from submarines running submerged.

"Most of the above experimental and practical work was done using wireless telegraph. Obviously, with the type of labor employed in mines, the radiotelephone will have to be used. From a theoretical point of view it is without doubt possible to communicate from the surface to the very bottom of 98 per cent. of the mines of the United States and to reverse the communication in about 80 per cent. of them.

"If a fire or bad cave-in does occur, whoever is below is almost instantaneously cut off from outside guidance. Radio offers a speedy relief to those who might be imprisoned as far as communication alone is concerned. Food can not be transmitted by radio. But the problem of foul air can be greatly helped by the use of directional instructions given from above.

"In the mining office there is a map usually kept up to date, showing every small stope, man-way and bulkhead in the mine. By means of radio communication from above, the miners might be

directed to a part of the mine where fresh air could be pumped down to them. They could also be told of the progress of the rescuers.

"In a testimony given at the inquest following a recent mine disaster, one man said that the skip might have brought up some of the imprisoned men before the guide timbers became burned off. Testimony answering this statement was that the signaling lines had been burned off and it would have been impossible to control the progress of the skip had it gone down. Radio communication can not become burned away, or destroyed in any manner."

"The apparatus would have to be highly portable. It would have to be more or less fool-proof in its tuning, because the mines certainly could not afford to send a radio operator down with each shift.

"Sets might be placed at intervals throughout the mine, to be used only in case of disaster and should be kept in working use all the time.

"In reviewing the situation as a whole and trying to see where radio would be useful to the mining industry, we find that it perhaps may be divided into three great heads. The first, of course, is safety, which we have already touched upon; the second is amusement; and the third perhaps might be called general communication. A great many mining communities are far away from the centers of civilization. Radio will put them instantly in touch with what is going on in the world. In other words, radio will do a great deal to civilize, educate and amuse isolated communities. This is no idle prediction. Then comes the problem of the solitary prospector. A crystal receiving set needs no batteries, does not weigh much and yet under good conditions at night can receive from 50 to 75 miles and perhaps even 100 miles. The lonely nights are lonely no longer.

"The problem of communication overland may not be so important, and yet, in the mountainous parts of the country where mines are most frequent, it costs a great deal to install, repair and keep in shape, particularly during the winter months, an overland telephone line. In a great many cases, such lines will cost a great deal more than a radio installation necessary to do the same work.

"In conclusion, radio is here and it is only necessary for the proper use to be demonstrated in the mining industry and it will be used in that industry."

Mr. Radio Man Here's Your Friend

Pardon me, Mister, but have you seen
This brand new radio magazine?
"Listening In," is the name—right there.
And its full of news from everywhere
It started small but watch it grow.
Rome wasn't built in a day, you know.
Already it's proven a big surprise,
For the second issue was double in size.
The trouble an amateur has with his set,
And he has a lot of it, you can bet,
Is all smoothed out, as can be seen,
If he will consult this magazine.
Get your copy to-day, its only a dime.
Its contents will afford you a wonderful time.
If you want something better than the rest,
Get "Listening In,"—you'll find it the best.

C. L. B.

Don't wory about hookups, condensers and other technical equipment, familarize yourself with these subjects by reading "Listening In," and then you will know just where you are at.

(*Continued from Page 36*)

is a wall of steel structures, in the west, the Bush Terminal and The Times Building are the only ones which project to a level with the antenna; the north horizon is clear and the south has no high buildings in the vicinity of Aeolian Hall. It is not expected that the downtown skyscrapers will shield the waves from spreading. The east has the only skyline which presents a shield of steel near Aeolian Hall, but due to the height of the antenna the engineers believe that there will be no difficulty in broadcasting messages far to the eastward, as in all other directions.

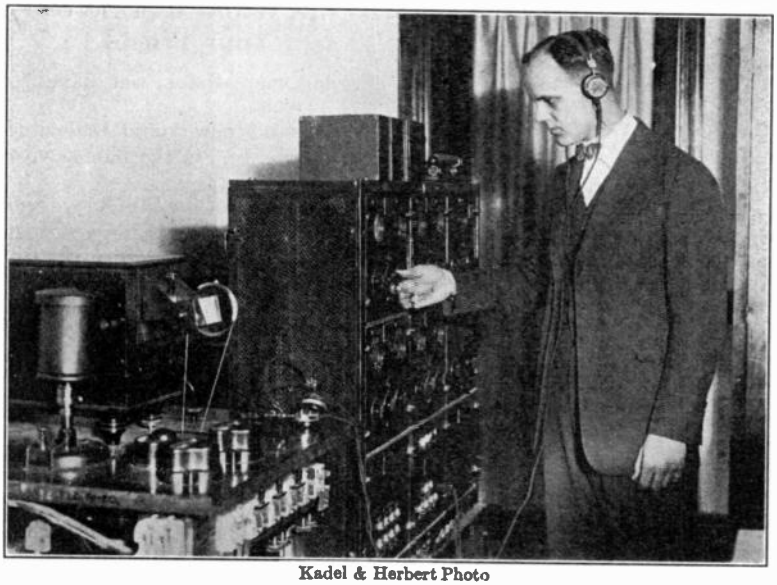
One of the new ideas to improve broadcasting from this station is the application of the Ossiligraph to the modulation waves while transmission is on.

The operator who controls the usual speech amplifier shown in the right side of the photo is able to watch the mirror on the square rotor just over the ossiligraph case and see the curves of the voice waves in action. So he can quickly adjust the speech amplifier much more accurately than depending upon hearing thru a small radio receiving outfit.

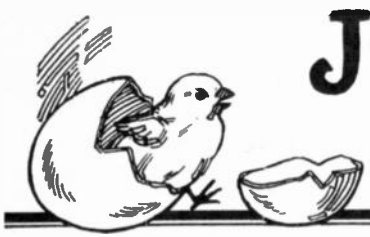
Radio Replaces the Oxcart

A broadcasting demonstration was recently conducted before President Li at the Presidential Mansion at Peking using a 500-watt transmitter there and at Tientsin. It is reported that the Chinese people, especially those living in the interior villages, are showing great interest in radio. News bulletins, music, lectures and sermons are sent into the ether from a Western Electric station at Tientsin. People are clubbing together and buying receiving sets.

Radio seems destined to be a distinct advantage to the Chinese people, as those living in the small cities and villages are shut off from all direct contact with life of their own country and the majority hear little of international happenings. Communication is very restricted between the villages, for the general method is by oxcart. It is estimated that these places make up 90 per cent of China.



Kadel & Herbert Photo



Just Out

New Apparatus, Devices and Patents

Condenser Data

Sir Oliver Lodge formed the first tuned radio circuit when he connected a condenser to an inductance, and this step helped wireless advance from the laboratory to be of commercial service.

Korda, a German, patented the first rotary variable condenser in 1893, but this type of condenser did not make its debut in the wireless field until about 1902. The first type consisted of two concentric cylinders, one of which was movable. The sliding plate condensers came next and were the popular type about 1910. Then came the rotating plate condensers, which are used at the present time. In the early type rotary condenser trouble was experienced in "dielectric losses"—that is, the insulating material between the stationary and movable plates absorbed some of the radio energy, causing leakage. The Bureau of Standards in 1915 developed a practically resistanceless condenser by using quartz supports. This low resistance increased the signal strength and made possible sharper tuning.

When purchasing a variable condenser the mechanical construction should be considered. Are the contacts good? Are the bearings smooth running? Are the plates accurately spaced and strongly clamped? Is a counterweight provided for the panel mounting types? Is the dial well calibrated? Are the rotary plates locked together and firmly secured to the shaft?

Good insulating material is essential. Quartz, porcelain and hard rubber are good. Bakelite is fair and fibre poor. A good condenser does not have small insulating bushings between metal parts which are at different potentials such as the stationary and movable plates and where a vernier plate is insulated from the main shaft.

A condenser having .001 mfd capacity is usually used in tuning low resistance antenna circuits, in a loop receiving circuit, in a wavemeter and in a radio filter. The .0005 microfarad condenser works well as an antenna series condenser for reception of the broadcasting stations and also across the secondary of the tuner.

A condenser in series with the antenna decreases the wave length and the smaller the capacity the greater will be the cut in wave length. If 600-meter commercial code stations interfere with reception of broadcasting stations, the series condenser will help to eliminate the dots and dashes if the antenna is not too large. A condenser shunted across an inductance increases the wave length.

The plate or plates of a vernier condenser should not be as thick as those of the ordinary variable condenser. The thicker the plates the greater will be the capacity. The purpose of a vernier is to obtain fine adjustment and it cannot be secured if the capacity is too large.

Avoid Loose Contacts

Many condensers are designed so there is a friction contact to the movable plates, that is, the contact is made by the shaft touching a piece of metal. This is a cheap and easy way to make a connection, but it will develop into a loose contact and dust collecting between the shaft and the contact point decreases the efficiency of the entire set. Good firm connections, usually made in the form of pigtails by wire fastened to the shaft

or bearing, form a far superior contact. Scratching and grinding noises in the phones are often traced to a friction contact on a variable condenser.

Sliding and friction contacts are all loose connections and are a source of trouble. It must be remembered that most of the energy radiated by the transmitting station is lost in space. Only the smallest fraction of the current broadcast is picked up by a receiving station. A loose contact places resistance in the path of the feeble impulses passing through the receiving set and the sound is greatly decreased if not inaudible in the phones. Using three stages of radio frequency amplification, a detector and one stage of audio frequency amplification, all connections clean and firm, signals are picked up at the New York Times radio station from Leafields, England. with sufficient strength to deflect a voltmeter.

Radio Fair Opens in New York

Since New York City is the largest buying center in the United States there has been a growing need for a centralized exhibition of radio apparatus where merchants and purchasers could go to view representative apparatus. Such an exhibition known as the Radio Fair was opened last winter in the Hotel Imperial, 31st and 32nd Streets and Broadway, New York.

The Radio Fair is open to buyers only during the morning and business cards only are accepted for admission. An expert radio engineer is in attendance to explain and demonstrate apparatus to buyers. In the afternoon and evening the room is open to the general public.

If you like newsy, illustrated features, read "Listening In."

Letters From Our Readers

Communications from our readers containing suggestions in regard to broadcasting, reports of novel experiences as Radiocepters, or anything having a general radio interest, will be published in these columns.

"The Radio Editor,
"Listening In" Magazine,
"47 Clinton avenue north.
"Dear Sir:

"While listening in Sunday evening, May 20th, about 7 o'clock, music and a speech was tuned in with my tube set about 100 meters. I understand Pittsburg has been transmitting on that wave. It came through strong when I was unable to get any other station, due to the unusual weather conditions that evening.

"The speaker's voice was unusually strong, but not quite clear, except when he talked in a low tone. I wonder if this was a fault of their transmission, the air conditions or my regeneration on 100 meters?

"I would be glad to hear from any of your readers about these 100 meter tests, especially if such tests were made on an evening when the weather was so bad as the one in question."

"Radiocepter."

"Editor of
"Listening In" Magazine.
"My dear Sir:

"I was very much pleased with the second issue of your magazine and appreciate the fact that it will be a benefit to all of us interested in radio.

"There have been many good suggestions published in your first two issues, but I am enclosing a few more which I hope you will be able to publish.

"Very truly yours,
"E. R. D."

"Radio and wireless are one and the same thing. Radio is not confined to speech and wireless to telegraph code as many people believe.

Using Radio in the Summer

Eugene Handler—Institute Radio Engineers

As the summer months approach the thought comes to many that their interest in radio is entirely too keen to be laid aside.

To these fans the question of how to get the most from their radio sets presents a problem. Radio offers wonderful possibilities during those long summer evenings in camp, or aboard the yacht.

How simple a matter to take along the radio set. With the vacuum tube available today one need not fear the heavy storage battery or large B battery. Instead just a small cabinet with tubes, batteries and phones completely assembled and you have a radio set ready to give you service from remote points.

How different from the days of yester year—Then, one in camp was out of touch with affairs—knew nothing of the events occurring during his absence from this work-a-day world of ours.

Today all this is changed. A radio set offers unlimited possibilities. Stock reports, baseball scores, songs, dance music, entertainment and outdoor concerts, are all available. Imagine yourself at "Camp Radio" far from the cares and the worries of business—a camp fire throws its cheerful and friendly light— you are in your old duds, resting peacefully after a hard day's tramp or sail—the old pipe is drawing well and the coffee pot is singing cheerfully.

What could be better than a bit of radio entertainment to complete this picture—or,—

Suppose yourself afloat—

A quiet night with the stars bright overhead—the restful rising and falling that is so soothing to a deep water wave. Sitting back in your deck chair you gaze at the friendly stars and listen to a tenor far away sing "Somewhere a Voice Is Calling."

There are so many methods of receiving entertainment and fun from your radio set.

Are you a "code Man?" To you comes the thrill of copying ships far from our shores, the press news of the world, the far flung voice of Arlington, Rome, Paris, Berlin—all eager to tell of the world's events and progress.

Who is leading in the American league? What will be the result of the coming fight? Will it rain tomorrow and spoil that fishing trip? Will it be cool enough to take heavier clothes on that motor trip?

Radio can tell you these things, and more.

Have You Ever Tried This?

Kadel & Herbert, Photo

Using the oar with a cross wire for an antenna, or constructing a small pole with the nearest wire, will permit you to listen in while your best beau takes you for a row or canoe ride. The above photo shows a party with a radio set listening in while in their row boat.

The Rating of Vacuum Tubes

By Virgil M. Graham

At the present time the users of vacuum tubes are unable to judge which ones are adapted to their needs, unless they are able to make laboratory tests.

In most of the vacuum tube advertising, statements are made with regard to the amplifying power of the tubes in question. These statements mean almost nothing when the real worth is to be considered.

However, positive data on the actual amplifying power of the tubes are very scarce. Knowledge of this data are very important if the tubes are to be used in audio or radio frequency amplifiers or in the new Hazeltine Neutrddyne circuits. One Pacific Coast company has recently given some meagre information about the "mutual conductance" of their tubes.

This mutual conductance is the true rating of amplifying power of a tube when used with the most common amplifying circuits.

By Ohm's Law we know that resistance is equal to electromotive force divided by the current flowing, that is

$$R = \frac{E}{I}$$

and we call the reciprocal of resistance "conductance" G, so that

$$G = \frac{I}{E}$$

thus giving the current flowing in terms of the electromotive force applied.

In the case of the vacuum tube we are dealing with alternating components of currents and voltages, so we will use i to denote the alternating component of the current flowing, that is a change of current and e to denote the alternating component of the voltage or potential applied. So the conductance of a pure resistance circuit to the changing or alternating component of a current is

$$g = \frac{i}{e}$$

What we are vitally concerned with in the amplifying tube is the relation of *change* of flow of anode current to *change* of applied potential, that is the ratio of the alternating components of this current and this voltage regardless of what their normal steady voltage is. It is this relation of changes that we call the "mutual conductance" g_m, so we have

$$g_m = \frac{i_a}{e_g}$$

It will be readily seen that if the tube has a large change of anode current for a given change in grid potential, it will have a large mutual conductance, so we know that a tube with a large mutual conductance makes the best amplifier for ordinary conditions.

While the mutual conductance may be measured directly by bridge methods, it is more usually determined by the use of the "amplification factor" k, and the anode-filament resistance r_a in the following equation:—

$$g_m = \frac{k}{r_a}$$

If it is desired, the mathematical derivation of this may be found in H. J. Van der Bijl's "Thermionic Vacuum Tubes."

Just a word in regard to these last two quantities mentioned might not be amiss. The amplification factor is the ratio of a change of grid potential to a change in anode potential when

the change in anode current is the same for both. It represents the maximum voltage amplification possible with the tube, approached only as the value of the impedance in the output circuit of the tube approaches infinity. The anode resistance is the relation

$$r_a = \frac{e_a}{i_a}$$

Both the amplification factor and the anode resistance are measured by bridge methods.

A point of importance in regard to the mutual conductance is the fact that it is a function of the *effective* direct anode potential.

This effective anode voltage is equal to

$$E_a + kE_g$$

so it may be seen that if a tube has an amplification factor of seven, and one-hundred volts are applied to the anode along with the grid potential of six volts negative the effective anode potential would be only fifty-eight volts. Practically the same mutual conductance would be obtained with this condition as when fifty-eight volts were applied to the anode and zero potential to the grid. These potentials are relative to the negative side of the filament, which point is arbitrarily considered the point of zero potential of the vacuum tube circuits.

In numerical values, if a tube has a mutual conductance of six hundred micromhos, the change of anode current for one volt change in grid potential will be six hundred microamperes or .0006 ampere, when the impedance in the output circuit is negligible

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Photos By Radio

Professor C. Francis Jenkins, inventor, of Washington, delivered an address on "Radio Photography, Movies and Vision," before the annual convention of the society of Motion Picture Engineers at the Hotel Traymore, Atlantic City.

"No newspaper can possibly put a distant news event before the public as quickly as the theater can with radio pictures," he said. "It is possible, perhaps probable that a news bulletin in pictures and type may be broadcast and the photopraphic negative thereof be used in the printing of the usual news bulletin sheet either by direct photographic process or by a photo-etching process, the etched plate for use in the printing press. This would eliminate the necessity of local typesetting plants.

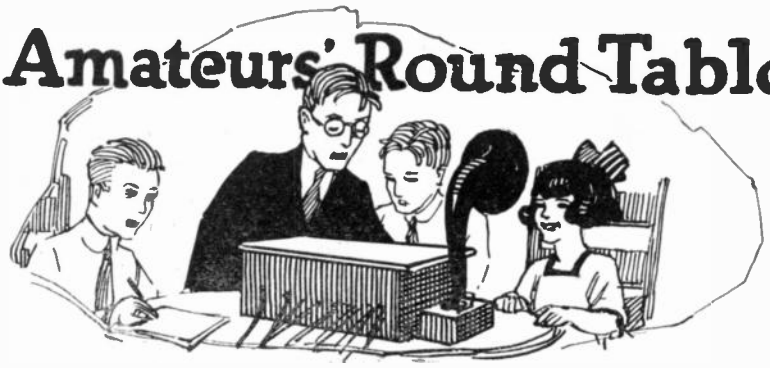
"The Police Department of the various cities of the country would also doubtless be customers for picture distribution service, as photographs of criminals, as well as their thumb prints could be readily distributed. Bankers and business executives could in a few minutes verify signatures to checks, drafts or documents; indeed, contracts and other forms of credit could be exchanged across the continent within the hour."

"Wireless is simply an older title bestowed on the art of transmitting signals through the ether without wire. Radio has come into more popular use since broadcasting became general.

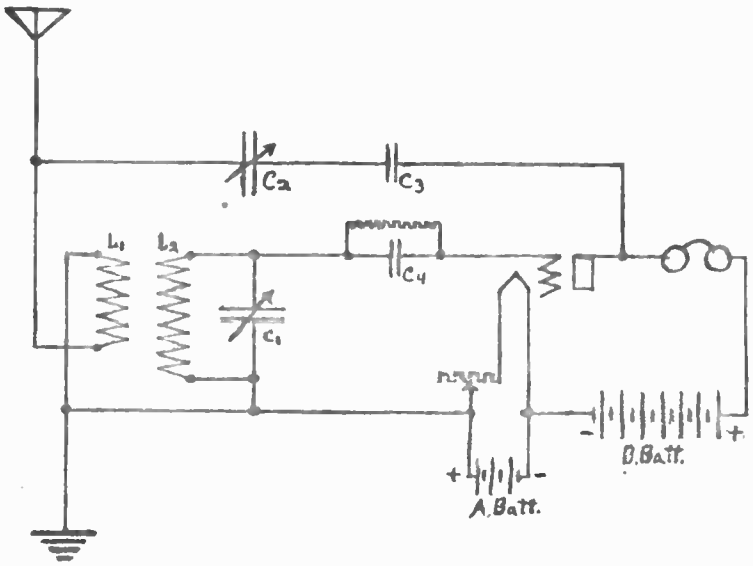
"Don't condemn your receiver if the signals fade out in the middle of a song. It is not the fault of the set. Long distance reception at night is really freak work. The signals are not fading out, but fade in, when you are able to hear them. The normal range of a radio set is determined by the distance covered during daylight.

"If you are using a single circuit tuner a simply constructed wave trap will help you eliminate much of your interference."

Amateurs' Round Table



FLIVVER CIRCUIT AMPLIFIER



This circuit was designed for a portable set. One two tube set as shown in the diagram having been built complete with A and B batteries in a cabinet 9x8x6 inches. Having but two variables tuning is simple and easily learned. In the hands of a novice the above set tuned 17 stations the first night tried.

The tuning inductance consists of two parallel wound coils of No. 26 d. c.c. copper wire on a five inch tube. This double coil is best wound by using two spools of wire starting with one lead from each spool, these are the high primary and secondary marked x and y. Wind 25 parallel turns then cut off and fasten one wire, this is the primary coil terminal. Continue winding the remaining single wire

for 15 more turns then fasten end, this is the low secondary (z).

The coil L3 is a radio frequency choke. A type 2A Graham reactor was used but any coil which will choke high frequency current without appreciably impeding audio will answer.

Condenser C1 is a 43 plate variable with vernier. C2 is a by pass of .001 capacity.

R1 is a non-inductive resistance of about 25 ohms. A Bradleystat was used and found satisfactory. R2 is a common rheostat controlling both tubes.

T is an audio frequency transformer.

W. D. 11 tubes were used in the portable set but two 201A valves give excellent results. Control is a little better with these tubes if a potentiometer shunting the A battery with the high secondary connected to the slider is used in place of the resistance R1.

Fred G. Rockwell,
104 East Main St.

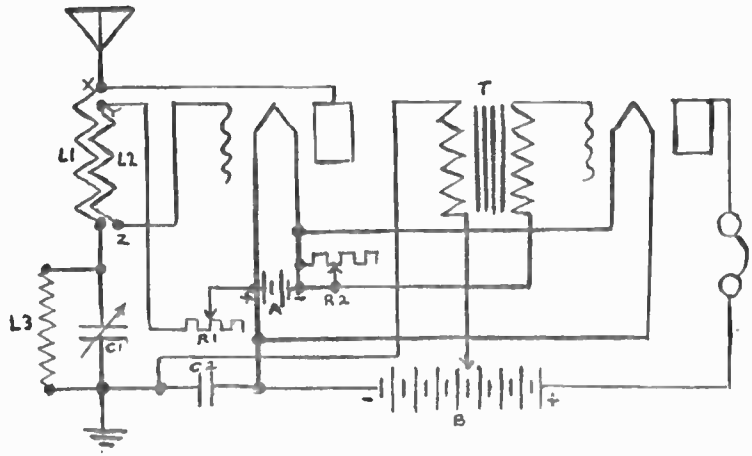
was possible to tune out WHAM and get WEAF and KDKA on the loud speaker with the use of a two stage amplifier.

It is very probable that this circuit could be greatly improved with further experimentation although the apparatus will be described exactly as used in the set in question.

The coupler L1 - L2 had fixed coupling and was made with two tubes, the smaller being of hard rubber and fitting snugly into the other. This rubber tube was three inches outside diameter and was threaded on a lathe deep enough to take a No. 28 D. S. C. wire flush with the surface. The thread was fourteen to the inch. The coil L1 was wound on this form, about fifteen or twenty turns being used.

The larger tube was of cardboard about three and three eights inches outside diameter, and was wound with forty-five turns of No. 21 S. C. C. wire in the same direction as the first coil.

Selective Regenerative Receiver



This circuit appears to be very much more selective than the ordinary single circuit regenerative tuner under the conditions which it was tested. A very short, low indoor antenna was used and it

The two tubes were placed together so that the inner coil was directly beneath the outer one.

Then the coupler was connected as shown in Fig. 1. Condensers C1 and C2 are thirteen plate vari-

able condensers. C3 is a .0001 mfd. Micadon condenser. The grid condenser C4 is also a Micadon of .00025 mfd. capacity. The grid leak must be chosen for the particular tube. A W D-11 or a W D-12 tube works well in this circuit.

The advantages of this set lie in the simplicity and ease of tuning there being only two adjustments, tuning with C1 and regenerating with C2.

Best results will be obtained if the connections to the coils and condensers from the tube are as short as possible.

Amplification may be added to this circuit in the ordinary way.

Radio Will Report North Pole Trip

Having crossed two oceans the American radio amateur now aims at the North Pole—or within 12 degrees of the top of the world!

Donald B. MacMillan, eminent Arctic explorer, on his last expedition to the far north in 1921, brought the white man's country to the Eskimo. He did this by means of motion pictures. When he showed the queer little people of Baffin Land pictures of Fifth avenue, they exclaimed, "Oh, look at the sledges go without dogs." Since then a new science has been developed—that of the radiophone—and when MacMillan returns to the polar regions next fall, he will say to these people: "Listen to the white men talk!"

Mr. MacMillan will be accompanied on his seventh expedition to the Arctic by an expert radio amateur provided by the American Radio Relay League. On a visit to the A. R. R. L. headquarters at Hartford, Conn., when he conferred with Hiram Percy Maxim, president, Mr. MacMillan said: "I will try to communicate with American amateurs at least once each week, whenever it is possible to get a message through." His vessel, the Bowdoin, was equipped with a receiving set on the 1921 expedition, and he succeeded at that time in hearing Arlington time signals at 12 o'clock noon and 10 o'clock at night. He had no operator with him and was, therefore, unable to receive messages from the States. This time he will have a regenerative receiving set and a continuous wave transmitter. With this equipment the explorer expects to penetrate the streamers and filaments of the aurora and cover easily the 2,000 odd miles from the vicinity of the Pole itself.

Every move of the expedition, from the time it leaves Boothbay, Me., until it arrives at the most northern extremity of the trip, will be followed by radio amateurs and newspaper readers throughout the country. A story of about 500 words in length, telling of the progress of the MacMillan party, will be sent each week by the amateur operator on the Bowdoin. Thousands of amateurs will listen for these messages from the Polar regions and news despatches will be relayed by A. R. R. L. members for distribution in the daily press. Members of the exploring party will keep in touch constantly with friends at home and these messages also will be relayed by the A. R. R. L. operating department.

During his visit to Hartford Mr. MacMillan was invited to inspect Mr. Maxim's radio station, 1AW, with which he expects to communicate from the Arctic next winter. Mr. Maxim's station has been heard by amateurs in Europe and he is confident that with his 500-watt transmitter he will be able to talk with the operator on the polar ship near Baffin Land. And the Eskimo may have an opportunity to listen to a strange new language—that of the international Morse Code—for the first time.

"Listening In," is small in size,
But its contents will afford you a surprise.
This is our third issue to date,
And we're certain you'll say its simply great.

Radio in the Country

Has Radio Increased the Farmer's Efficiency?

Just two or three short years ago the farmer, situated as he is many miles from the nearest important business center, was regarded as a very ordinary, steady, nondescript individual, living way "out in the sticks," a person who paid little heed to the progress being made in the world in general.

This general impression was more or less well founded in many respects. Regardless, whether the farmer was vitally interested in those matters which go to make up the fundamentals of the world's progress commerically and in trade circles, he was greatly hampered by his own environment.

To begin with, the farmer, living many miles from the nearest news distribution point, had to depend on his day or two-day-old newspaper as a source of information. With this exception his only other source of news was the gossip or bits of conversation which he picked up on his periodical journeys to the trading and general market centers.

Insofar as being able to take advantage of those enjoyments afforded by the theater, that was invariably out of the question. Only in rare instances did such opportunities present themselves, and then only in the form of some third-rate "ham" company that made a practice of playing "tank towns."

Take a look at the farmer today. The modern farmer worries not about his present-day source of information. He knows accurately and in advance all details regarding market conditions relative to his produce and products. He is also previously informed as to weather conditions in his vicinity so that he may plan judiciously in the matter of handling and protecting his crops.

Further, take the matter of entertainment. Heretofore the farmer was deprived of the enjoyment to be derived from hearing the wonderful musical compositions of the old masters, unless one of his family happened to be an accomplished musician.

To-day the privilege to hear world-famous orchestras playing these compositions in concert is accorded him each evening in his home.

And how has all this been accomplished. The answer is radio. The progressive farmer realizes the natural benefits to be derived from the possession of a radio receiving set in his home. By this means he keeps in active touch with the activities of the world outside his domain and consequently his individual independence has increased nearly a hundred fold.

Truly, need anyone ask if radio has increased the farmer's efficiency or if it is worthy of his support?

Round-the-stove conferences once devoted to the discussion of national political issues have been suspended in favor of radio broadcast entertainment, addresses and sermons.

A sermon delivered by the Rev. Dr. Philip Frick, pastor of the First Methodist church in Schenectady, N. Y., was broadcast by WGY, the General Electric Company station. Dr. Frick received the following letter from "Bill" Davenport, of Hillside Farm, Jefferson, New Hampshire:

"My dear Sir:

You will see by the heading of this letter I am way up in the White Hills, right under Mount Washington. Today, Sunday, I had occasion to go to the store of F. O. Giddon and while there I heard a sermon preached by you which I enjoyed very much. In fact it is the first one I have heard in 35 years. So you will see I am not much of a church-goer and to think you, away off in New York, should be the first one to catch me. The sermon was very distinct and the singing was fine. In our little town we have three churches, but there are quite a few of us old hardshells who rather go to the store and discuss whatever has transpired through the week.

"I just wish you could have looked in on the bunch while you were preaching. We were all held spellbound. You could have heard a pin drop anywhere in the room.

"Hope you will not think we are all heathens up here in the mountains. I should be very glad, if you ever came this way, to have you for my guest for a few days. Hoping that I may be able to hear another one of your sermons I remain,

—"Bill" Davenport.

Live Tips for the Radio Builder!

Probably the most usual thoughts in the minds of the radio builder and experimenter, is how to build an efficient outfit with the least number of parts and at the least cost. The old time amateurs who have built efficient receiving outfits with radio frequency amplification often like to try out a simple outfit and experiment with it.

We are presenting here the latest form of the Radio Flivver receiving outfit. The use of a variometer instead of the honeycomb coil for short wave work, improves the flexibility, causes the set to regenerate over a greater range and increases the signal strength greatly. The set is as sensitive and selective as any other single circuit receiver. Capacity effects can be almost entirely eliminated by connecting the rotor of the condenser to the ground side.

This circuit requires a good mica insulated grid condenser because the full plate voltage is on one side. An efficient variable grid leak shunted around the grid condenser will be an improvement when the adjustment is correct. Try a high resistance about 4 megohms. Also try a phone condenser .001 mfd across the head set terminals.

Following is the apparatus needed:

1—Variometer with the total turns about 75-80.

1—Variable Condenser, 13 plates, app. .00035 mfd.

1—Grid condenser, mica insulated .00025 mfd.

1—Variable grid leak of reliable construction.

1—Filament Rheostat.

1—Phone condenser .001 mfd.

1—Tube socket with good spring contacts.

1—Formica or Celeron panel 6" x 12".

1—Open circuit jack.

Accessories

1—Vacuum Tube WD-11 or UV-199.

1—Dry cell for filament lighting.

1—B Battery.

Don't forget your radio outfit on that vacation trip. Its sure to afford you one of your greatest sources of entertainment while you are "far from the maddening crowd."

Daily Broadcasting Programs

WHAM—ROCHESTER, N.Y.

The Radiophan's Friend
Eastern Standard Time
(360 Meters)

Wednesday, May 30th

2:55 P. M.—Weather forcast.
3:00 to 3:30 P. M.—Eastman Theater orchestra.
4:15 to 4:45 P. M.—Eastman Theater organ and orchestra.
7:00 to 7:30 P. M.—Eastman Theater orchestra.
7:30 to 8:30 P. M.—Popular program given in the studio of the Radio Dealers' Club.
7:30 P. M.—Selection on the Duo-Art reproducing piano, courtesy of the Balcom Music Co.
7:35 P. M.—Children's story, "Memorial Day Story," told by Miss Georgina Speare.
7:40 P. M.—Announcement of baseball results.
7:45 P. M.—Recital by Helen Kirlakowsky, pianist, 13 years old. Program:—Etudes, "Idyll;" "Shadow Dance;" "Hungarina," by McDowell; "Reverie" and "Etude Mignonne," by Schuett played by Miss Kirlakowsky. —Reading, "The Little Red School House," given by Edith Kirlakowsky, six years old. Piano solo, "Minuet," by Paderewski, played by Helen Kirlakowsky. Reading, "Sheridan's Ride," given by Al. R. Fowler. Piano solo, "Poupee Valsante," (Waltzing Doll) by Poldini, played by Helen Kirlakowsky. Reading, "Our Flag," given by Edith Kirlakowsky. Piano solos, "Butterfly," by Gricy; "Etude," by Moszkowski; "La Fileuse," (The Spinning Wheel) by Raff, played by Helen Kirlakowsky.
8:30 P. M.—Weather forcast.

June 2, 6 and 8

8:45 P. M. to 9:15 P. M.—Concert from Kilbourne Hall, Eastman School of Music.

Tuesday, June 5

7:30 P. M. to 8:00 P. M.—Concert by Markham's Orchestra.

Thursday, June 7

7:30 P. M. to 8:00 P. M.—Selections by the Liberty Male Quartette.

WGY—SCHENECTADY, N.Y.

General Electric Co.
Eastern Standard Time.

For Week of May 27th

All members of the Boy Scouts and those interested in Boy Scout activities, will enjoy the novel Program planned by WGY, the Schenectady, N. Y., radio broadcasting station of the General Electric Company for Tuesday evening, May 29. The program furnished by the Schenectady Boy Scouts will follow the activity of the scouts from reveille to taps.

Thursday night, May 31, the WGY Players will present Augustus Thomas' drama "The Copperhead." On the following night, June 1, the MacGregor Male Chorus of Saratoga, N. Y., will furnish a particularly fine program. A special program has been arranged for the children for Friday night, June 1, at 5:30 o'clock, eastern standard time. Anita and Jean Williams will be the entertainers.

Saturday night, June 2, Justice John H. Clarke, of the United States Supreme Court, will speak at Chancellors Hall, Albany, on the League of Nations, under the auspices of the Albany County Branch League of Nations Non-Partisan Association. The address will be broadcasted by WGY. Justice Clarke will be introduced by Governor Alfred E. Smith.

Tuesday, May 29

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, "Safe Milk," Grace Sickler Babcock.
5:00 P. M.—Produce and stock market quotations; news bulletins; baseball results.

7:35 P. M.—Address, "Oysters, America's Greatest Sea Crop," by Russell Suter, New York State Conservation Commission.
7:40 P. M.—Baseball scores.
7:45 P. M.—Boy Scout program, furnished by the Schenectady Boy Scouts of America. This program will consist of a series of events given in their natural sequence and founded on actual happenings at the summer camp of the Scouts. The presentation represents a lapse of time from reveille at 6:55 A. M. to taps at 9:45 P. M.

Part I

First Call—reveille; Mimetic setting up exercises; Morning dip; Morning colors; Mess call; Bugle march; Breakfast — Orchestra "Our Director"; Squad duties; Instruction—Resuscitation, by Captain Harry McManus, Life Saving Instructor; Inspection — Deputy Commissioner C. E. Gregg; Tenderfoot Investiture Ceremony, Scouts of Troop 22—Scout Master Sidney Cromie; Swimming—Life Guard Posted; "There Are Swims."

Intermission

"NC 4 March," Schenectady Boy Scouts Orchestra, C. E. Gregg, director.

Part II

Second Class Court of Review—District Commissioner J. F. Howard; Court of Honor—First Class Tests, L. B. Sebring, Chairman of the Court of Honor; March—Bugle; Afternoon swim; "Court Martial," by Scoutmaster Sidney Cromie; Evening Colors; Mess call —"Rotary Song."

Intermission

"Why is the Moon Always Shining," Scouts orchestra.

Part III

Two Hours Later—"Hail, Hail, the Gang's All Here;" A Scouts Responsibilities, Scout Commissioner R. O. Bixby; Good turns; Camp fire stories; "A Hair Raiser," Scout Executive Gray; Camp Rotary Scout song; Bugle calls— Call to quarters— tattoo— taps.

Wednesday, May 30

Holiday—Station Closed.

Thursday, May 31

380 Meters WGY
(Schenectady, N. Y.)
General Electric Company
Eastern Standard Time

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—Vegetables and Fruits," 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, "The Copperhead," by Augustus Thomas; produced by WGY Players.

Instrumental selection, March, "U. S. Field Artillery"..Sousa-Fisher, WGY Instrumental Quartet.

Characters in Part One.

Joey Shanks.....Earl Harvey
Grandma Pearley.....Ida Myreck
Ma Shanks.....Viola Karwowska
CaptainHardy..J. S. B. Mullarkey
Milt Shanks....Edward H. Smith
Mrs. Bates....Margaret V. Smith
Sue Pearley...Rosemary St. Louis
Lem Tollard.....Frank Oliver
Newt Gillespie.Courtland Hopkins
Andrews, a Minister.E. E. St.Louis
Sam Carter.... Herman Schulman

Characters in Part Two

Milton Shanks.. Edward H. Smith
Madeline King.....Ruth Schilling
Mrs. Manning.Margaret V. Smith
Colonel Hardy
James S. B. Mullarkey
Dr. Randall....Herman Schulman
Newt Gillespie.Courtland Hopkins
Lem Tollard.....Frank Oliver

First Epoch—1861-1863

Act I—The dooryard of Milton Shank's home.

Instrumental selection, "Old Fashioned Reel".....American Quartet

Act II—The same as Act I. Two years later.

Instrumental selection, "Medley of Southern Airs".....Fisher Quartet

Second Epoch—Forty Years Later

Act III—The dooryard of Milton Shank's home.

Instrumental selection, Medley Overture ..... Vosburg Quartet

Act IV—The living rom of Milton Shank's home.

Instrumental selection, "Patriotic Potpourri" ..... James Quartet

Friday, June 1

11:30 A. M.—Stock market quotations.
11:45 A. M.—Weather Forecasts.
11:55 A .M.—Time signals.
1:00 P. M.—Music and talk, "Graduate School of Homemaking" (courtesy of *Modern Priscilla*).
5:00 P. M.—Produce and stock market quotations; news bulletins; baseball results.
5:30 P. M.—Special children's program "The Kewpie Doll," by Anita and Jean Williams, ages 13 and 7 years, Katherine Chamberlayne, accompanist; "The Family Picnic," Jean Williams; Musical selections, "Sunny Jim," by Jean and Anita Williams; "The Ginger Bread Man," Jean Williams.
7:35 P. M.—Health talk, State Department of Health.
7:40 P. M.—Baseball scores.
7:45 P. M.—Musical program.

Chorus selections,
a. "Invictus" ..... Huhn
b. "On the Water"..Mendelssohn
MacGregor Male Chorus
Albert Platt, Director

Tenor solo, "Forgetting"...Ernest Marion Fraisier

Reading, 'Their Only Child".Anon.
Mrs. Frank Benford

Chorus selections,
a. "Macushla" .. MacMurrough
b. "Barcarolle" ..... Offenbach
MacGregor Male Chorus

Soprano solo, "The Bitterness of Love" ..... Dunn
Eleanore L. Hillebrand

Baritone solo, "Light" .... Evans
John Morris

Double Quartet,
a. "He Found It" ..... Jones

b. "Lament in A Flat"..Stevens
MacGregor Male Octette
Tenor solo, "Dream Longing" ..... Brown
Edward Vines
Chorus selections,
a. "Swing Along" ..... Cook
b. "Deep River" .....Fischer
Baritone solo, "Mother o'Mine ..... Tours
James A. Long
Soprano solos,
a. "Ma Curly Headed Baby" ..... Clutsam
b. "The Little Damozel". Novello
Eleanore Hillebrand
Chorus selections,
a. "Gypsy Trail" .... Galloway
b. "Ford Song" .... A. Flivver
Howard Balch and Chorus
Reading, "Surprising Eliza". Anon.
Mrs. Frank Benford
Tenor solo, 'My Lady"....Salter
George Raymond
Chorus selections,
a. "Old Black Joe". Arr. by Platt
b. "The Rosary" ..... Nevin
Chorus selections,
a. "The Cossack"....Moninszko
b. "I'se Gwine Back to Dixie" ..... White

Friday, June 1

(Late Program)
10:30 P. M.—Concert program.
Piano solo, "Le Rossignol"..... ..... Aladieff-Liszt
Earl Rice
Contralto solo, "The Star"..Rogers
Clara Habel
Ivan Strough, accompanist
Instrumental Suite, for violin, cello and piano, "Prelude"....Parker
The American Trio
Edward A. Rice, violin; Ernest Burleigh, cello; Earl A. Rice, piano.
Reading, "Learning to Drive".. ..... Anon.
Helen Zander.
Cello solo, "Extase.....Ganne
Ernest Burleigh
Contralto solo, "By the Waters of Minnetonka" ..... Lieurance
Clara Habel
Instrumental Suite, "Minuet".. ..... Parker
The American Trio
Reading, "So Was I".....Smiley
Helen Zander
Violin solo, "From the Canebrake" ..... Gardner
Edward A. Rice
Contralto solo, 'Mighty Lak a Rose" ..... Nevin
Clara Habel
Instrumental suite, "Romance".. ..... Parker
American Trio
Reading, "Descended from Christo Colombo" ..... Anon.
Helen Zander
Orchestra selection, "Chanson Sans Paroles" .....Debussy
WGY Instrumental Quartet

Saturday, June 2

11:30 A. M.—Stock market quotations.
11:45 A. M.—Weather Forecast.
11.55 A. M.—U. S. Naval Observatory time signals.
7:00 P. M.—Address by Justice John H. Clarke of the United States Supreme Court on the League of Nations.

WWJ–THE DETROIT NEWS

Eastern Standard Time

Wednesday, May 30

9:30 A. M.—"Tonight's Dinner" and a special talk by the Women'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; program furnished by members of the Charles A. Learned Post, American Legion.

Thursday, May 31

9:30 A. M.—"Tonight's Dinner" and a special talk by the Women'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; the Cathedral Male Quartet; Thomas C. Evans, tenor; Edward Galer, tenor; George Macdonald, bass and John Renton, bass.

Friday, June 1

9:30 A. M.—"Tonight's Dinner" and a special talk by the Women'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.
7:00 P. M.—The Town Crier; The Detroit News orchestra; Miss Jessie Phyllis Kopatz, Mezzo-soprano; Miss Mildred Seeman, pianist.

Saturday, June 2

9:30 A. M.—"Tonight's Dinner" and a special talk by the Women'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, June 3

11:00 A. M.—Church services from St. Paul's Cathedral.
4:00 P. M.—The Detroit News orchestra.

KSD—ST. LOUIS POST-DISPATCH

Central Time

Week of May 28th

Monday, May 28

8:00 P. M.—Broadcasting the complete opera "Naughty Marietta" from the Municipal Opera Theater, St. Louis. Noted principals, chorus of 100, orchestra of 80.

Tuesday, May 29

8:00 P. M.—West Presbyterian Sunday School orchestra. John H. Eggert, Director.

Wednesday, May 30

8:00 P. M.—Orchestral concert and musical specialties at the Grand Central Theater.

Thursday, May 31

Silent.

Friday, June 1

8:00 P. M.—Broadcasting the complete Opera "Naughty Marietta" from the Municipal Opera Theater in St. Louis. Noted principals, chorus of 100, orchestra of 80.

Saturday, June 2

3.00 P. M. —Children's concert, Dorothy Corkins, vocalist and reader, W. J. Forestel, Jr. Reader; Esther Portman, pianist.
7:30 P. M. — Baseball scores, World Market Survey, U. S. Public Health Broadcast.
8:00 P. M.—Special orchestral concert with solos broadcasted from the Missouri Theater.
11:30 P. M.—Organ Recital at Missouri Theater by Stuart Barrie.

WOC—DAVENPORT, IOWA

Central Standard Time

Tuesday, May 29

10:55 A. M.—The 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 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 30

10:55 A. M.—Time Signals.
11:00 A. M.—Weather and River forecast.
11:05 A. M.—Opening Market quotations.
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.
8:00 P. M.—Pipe Organ Recital—E. John Richards, organist, assisted by Jeanette Brewbaker, soprano.
10.00 P. M.—Artist Musical program—Erwin Swindell, Musical Director. Program furnished by the Ward Trio, of Sterling, Illinois.
Immediately following the late musical program, "Tourists' Road Report."

Thursday, May 31

10:55 A. M.—Time Signals.
11.00 A. M.—Weather and River forecast.
11:05 A. M.—Opening Market Quotations 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.

Friday, June 1

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

Saturday, June 2

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.
9:30 P. M.—Dance Program (one hour)—P. S. C. Orchestra.

KYW—CHICAGO, ILL.

Daylight Saving Time

Wednesday, May 30

8:00 to 8:58 P. M.—Musical program will be given by the following artists: Nathalie Gilmartin, soprano and the Salvation Army Staff band—Adjutant J. Arthur Finn, conductor.

Program will be announced by Radiophone

8:58 P. M.—Naval Observatory time signals.
9:00 P. M.—News and weather report.
9:05 P. M.—Special features as announced by radiophone.

Thursday, May 31

8:00 to 8:58 P. M.—Musical program will be given by the following artists: Elizabeth Jenks—soprano, Raymond A. Moroney—baritone, Ned F. Dunn—pianist, The Roseland Trio—vocal, Jennie Gross—contralto, Adolph Gross—baritone, Thos. Liddell—tenor, Adale Wahlberg accompanist. Program will be announced by radiophone.
8:58 P. M.—Naval Observatory time signals.

9:00 P. M.—News and weather reports.
9:05 to 9:25 P. M.—Reviews of the latest books by Llewelyn Jones.
10:00 P. M. to 1:00 A. M.—Midnight Revue.

Saturday, June 2

8:00 to 8:58 P. M.—Musical program will be given thru the courtesy of the following artists: Helen Engelke—soprano, Henry E. Nieman—accompanist, Mildred Bragdon—reader, Paula and Polly—An unusual parrot act, Robert G. Ball—baritone, Gertrude Grosscup Perkins—accompanist.
Program Will Be Announced By Radiphone.
8:58 P. M.—Naval Observatory time signals.
9:00 P. M.—Weather report.
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.

WGY—Schenectady, N. Y.

Eastern Standard Time

By means of land wire connection with Carnegie Hall, New York City, WGY, the General Electric Company radio station at Schenectady, N. Y., will broadcast a program provided by the National Electric Light Association, Thursday evening, June 7, beginning at 7:30 o'clock, eastern standard time. The program will include a fifteen-minute organ recital, orchestral number, soprano solos by Anna Case of the Metropolitan Grand Opera Company and an address by Julius H. Barnes, president of the United States Chamber of Commerce.

The WGY Players will present J. Hartley Manners' comedy, "Happiness," Tuesday night, June 5th. A special program of music will be offered by the Rice String Quartet at the late program Friday evening, June 8th. This program will start at 10:30 o'clock, eastern standard time.

Monday night, June 4th, James A. Hamilton, Secretary of the State of New York, will deliver an address on "Drug Addiction—An International Menace." An added feature of the WGY program will be a report, every Thursday at 5:15 o'clock, on the condition of roads in New York State. This report is made by Frederick S. Greene, State Commissioner of

Highways and it will be particularly useful for automobilists in planning week-end trips.

SUNDAY, JUNE 3

10:00 A. M.—Service of St. George's Episcopal Church, Schenectady, N. Y.
Organ voluntary, "Grand Chorus" ..... Faulkes
Helen Stevens

Processional hymn, "Saviour, Blessed Saviour" .....Morley
Venite (Anglican Chant) ..... Robinson
Psalter, for the third morning of the month
Te Deum, in F .....Simper
Jubilate (Anglican Chant)..Hindle
Kneeling hymn, "Three in One and One in Three" .....Stainer
Hymn before Sermon, "How Firm a Foundation" .....Reading
Sermon, "Do Christians Really Know Christ?
Rev. B. W. Taylor, D.D., D.C.L.
Offertory anthem, "Praise the Lord, O My Soul" .....Marks
Recessional hymn, "O Saviour, Precious Saviour" ....McCarthy
Organ postlude, "Festival March" ..... Foote
Helen Stevens

6:30 P. M.—Services of St. George's Episcopal Church, Schenectady, N. Y.
Organ voluntary, "Andante" ... . La Marie
Helen Stevens

Processional hymn, "Sun of My Soul" ..... Hursley
Choral service, Tallis, in F
Psalm 91, Anglican Chant
Magnificat and Nunc Dimittis .. .. Foster
Kneeling hymn, "Come, Ye Disconsolate" ..... Webbe
Sermon, "The One Who Knows Us" Rev. B. W. R. Taylor, D.D., D.C.L.
Offertory anthem, "The Radiant Morn Hath Passed Away" ... . Woodward
Recessional hymn, "Abide with Me" ..... Monk
Organ postlude, "Theme" Faulkes
Helen Stevens

MONDAY, JUNE 4

11:30 A. M.—Stock market quotations.
11:45 A. M.—Weather forecast.
11:55 A. M.—U. S. Naval Observatory time signals.
1:00 P. M.—Music and needlework talk, "The Facinating Art of Block Printing."
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.
Instrumental selections, "Idyl".. ..... Brooks
WGY Instrumental Quartet
Reading, "Trick versus Trick,".. ..... Wood
Mrs. Ralph A. Garrison
Instrumental selection, "Fancy".. ..... Rollinson
Quartet
Soprano solo, "A Birthday" .... Woodman
Sadie Gingold
Lela Kortez, accompanist
Address, "Drug Addiction—An internation Menace," James A. Hamilton, Secretary of State of New York.
String Trio, "Allegro" ..Schubert
Edward Rice, violin; Leo Kilwen, viola; Ernest Burleigh, cello
Reading, "Mary Cary" ....Bosher
Mrs. Garrison
Cello solo, "To a Wild Rose" .... MacDowell
Ernest Burleigh
Soprano solo, "When Song is Sweet" ..... Sans Souci
Sadie Gingold
Reading, "Mr. Brown Has His Hair Cut" ..... Anon.
Mrs. Garrison
Soprano solo, "My Heart at Thy Sweet Voice" .....Saint Saens
Sadie Gingold
Instrumental selection, "Cuban Dance" ..... Cervantes
Quartet

TUESDAY, JUNE 5

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, "The Moscow Art Theater," Mrs.

A. B. McKenzie, Schenectady Women's Club.

5:00 P. M.—Produce and stock market quotations; news bulletins; baseball results.

7:35 P. M.—Address, "The Saratoga Cure," by John G. Jones, Superintendent, Division of Saratoga Springs, New York State Conservation Commission.

7:40 P. M.—Baseball scores.

7:45 P. M.—Radio drama, "Happiness," by WGY Players.

Instrumental selection, "At Dawning" ..... Cadman
.. WGY Instrumental Quartet ..

Comedy, "Happiness" .....
..... J. Hartley Manners.

WGY Players

The Cast

Philip Chandos.....Frank Oliver
Fermony MacDonaugh...Edward H. Smith.
John Scowcroft..Jas. S. Mullarkey
Mrs. Chrystal-Pole .. ..
..... Viola Karwowska
Miss Perkins.....Ruth Schilling
Mrs. Wreary.....Ida Myrick
An Assistant.....Dorothy Golub
An Applicant.....Lola Sommers
Jenny .....Margaret V. Smith

Phase the First—Looking Forward

In Mrs. Chrystal-Pole's apartment in New York. (There will be a lapse of a few seconds to suggest the time taken by Mrs. Wreary to arrive from Brooklyn.)

Instrumental selection, "The Heart of Her" .....Cadman

Orchestra

Phase the Second—The Cry of Youth.

In Mrs. Chrystal-Pole's apartment, a week later.

Instrumental selection, "Love Me" ..... Zamecnik

Quartet

Phase the Third—Pressing on.

Mrs. Wreary's lodgings in Brooklyn. Eighteen months later.

Instrumental selection, "Eleanor" ..... Deppen

Quartet

Epilogue—"Happiness"

At Madame Epinard's. After many years.

Instrumental selection, "Valse Danseuse" ..... Miles

Quartet

WEDNESDAY, JUNE 6

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, JUNE 7

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—Cereals," 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.
5:15 P. M.—Weekly report on conditions of roads in New York State, by Frederick S. Greene, State Commissioner of Highways.
7:25 P. M.—Baseball scores.
7:30—7:45 P. M.—Organ recital.
7:45—8:00 P. M.—Musical selections.
8:00 P. M.—Soprano solo by Anna Case (Metropolitan Grand Opera Company),
8:15 P. M.—Address, Julius H. Barnes, President of the United States Chamber of Commerce.
8:45 P. M.—Soprano solo, by Anna Case.

FRIDAY, JUNE 8

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, "What to Buy for the New Home."
5:00 P. M.—Produce and stock market quotations; news bulletins; baseball results.
5:30 P. M.—Children's program.
7:35 P. M.—Health Talk, State Department of Health.
7:40 P. M.—Baseball scores.
7:45 P. M.—Musical program by WGY Orchestra and Elizabeth Sowers Primmer, soprano.
March, "Our America" .... Keck
WGY Orchestra

Waltz, "Vacation Time" ..Coutant
Orchestra
Soprano solo, "Carmena" ..Wilson
Elizabeth Sowers Primmer
Intermezzo, "Where Dreams Come True" ..... Voll-Belwin
Orchestra
Soprano solo "Thora" .... Adams
Elizabeth Sowers Primmer
Instrumental selection, "The World is a Song" ..... Vane-Belwin
Orchestra
Some humor, from "Topics of the Day" (Courtesy of the Pathe Exchange)
Violin and cello duet, "Little Girl of Long Ago" ....Baron-Belwin
Edward Rice, Ernest Burleigh
Orchestra accompaniment
Waltz, "One Little Smile" .....
..... Herbert-Morris
Orchestra
Soprano solo, "Until the End of Time" ..... Petrie
Elizabeth Sowers Primmer
Reverie, "A Rose Garden" ....
..... Fischer
Orchestra

The DuBois Press, Rochester, N.Y.

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