

RADIO LORE FOR NOVICE AND EXPERIENCED FAN

Hundreds of Thousands Now Finish Education by Radio

Universities Keep Step With World Progress by Adding Lecture Courses for Broadcasting.—New York Announces New Subjects

BY RUFUS D. SMITH AND FRANCIS E. TAYLOR.

It has long been recognized that universities cannot maintain their position as public servants by merely offering training to those who are fortunate enough to be within their walls during a regular academic period. Particularly is this true in a democracy, where universities are more definitely a necessary part of the life and growth of the people. For this reason universities have developed extension divisions, where instruction may be gained and information given to those who are unable to attend the regular academic courses. Hundreds of thousands of students to-day are unacquainted with the inside of university classrooms, yet they are members of these universities. By means of extension lectures, by means of correspondence study, the message of the university has been carried to the home of the inquiring student. It has made it possible for a great number of persons who would otherwise be without college training to acquire training which they could not take time to receive during their earlier life.

Radio is a further extension of the university and is only beginning to prove itself as an aid to the diffusion of knowledge. That the New York University is recognizing the radio as a regular educational method is illustrated by the fact that the department of broadcasting has been definitely placed with the extramural division, whereas, heretofore, it has been merely an adjunct of the public information service of the university. This does not indicate that the university considers radio talks as equivalent to college lectures; they occupy a totally different relation to education. Their essential purpose is to offer a card of introduction to new realms of knowledge, new discoveries and new theories about old facts. They are primarily designed for those persons who are interested in knowledge for the sake of knowledge and not for an academic degree. They do not lend themselves to the thorough and methodical consideration that goes hand in hand with academic work in the classroom or the laboratory. They are incentives to new adventures in knowledge.

Every exploration of a new field of knowledge is an adventure. The university believes that there are many American people who await only the inspiration of a trained scholar to open these unexplored areas of knowledge to enter upon intellectual adventures as full of interest as any adventure in the physical world. It is this inspiration, if the university can supply this stimulus through its corps of scholars it will have achieved its purpose for the time being in radio broadcasting.

Radio does not mean that the use of the radio may not develop to accord more and more with other means of college education, even to the extent of granting credit for radio instruction. It is not practical at this stage, but in the same way that all new methods of instruction must be worked out until they produce a desired end, so radio education must develop through a process of trial and error. It is the chance as a means of diffusing knowledge. One way in which this can reasonably develop is in conjunction with the regular home study courses which are already being conducted. It is the duty to be the first in which radio lectures will bear definite relation to other forms of college education. In the meantime, it has, in a number of ways, given the student a means of taking the results of long study and scholarly attainment directly to the door of the most remote hamlet or dwelling. Old men who do not care to mingle with youth in the classroom, young men who are not able to do so, are given the opportunity by turning a dial to become acquainted with things they have always wanted to know and which they may be able to use in their daily lives. This acquaintance study about on their own initiative.

New York University was one of the first American universities to attempt educational broadcasting. It was five years ago, in 1921, that the first educational talk was given. The university has experimented with giving the radio talks from the classroom and from the regular radio studio. It has also experimented with long series of lectures, in which printed syllables were used somewhat after the nature of a correspondence course. It is experimenting particularly now with the use of the radio in the home, by means of the intent of comparing their reception by the radio audience and their value to such audience as compared with longer courses.

To face the university has not attempted to use the radio in connection with a regular correspondence course. This appears to be a natural avenue of development. The talks which the university has given have achieved recognition by the general public. J. C. Stobart, the educational director of the British Broadcasting Company, commented favorably upon the lectures in speaking about his own work in educational broadcasting. The British Broadcasting Company began in the autumn of 1923 to broadcast educational talks in a limited way. In 1924 radio education was conceived to have an important place in the work of British public instruction, and in the autumn of that year a director was appointed to definitely develop a radio education programme for British educational purposes.

It is thus seen that the educational possibilities of the radio were discovered by American stations through the co-operation of private universities somewhat before the British stations. However, under the present system of presenting educational material, the British Broadcasting Company, being under State control, has advanced its educational work to a greater degree than that carried on in the United States. European nations followed suit and now maintain State-directed bureaus for radio education.

With the experience that the university has gained in broadcasting during the last few years, the light of experience in other countries where the radio is being made to fill a definite place in the service of education, it is unlikely that the recognition of the educational value of the radio will diminish in importance. Rather, it is likely that new possibilities for radio education will become apparent.

New York University began its broadcasting with WJZ. It has continued using radio for lectures during each regular school year and is now broadcasting three evenings each week through WOB. In addition, summer lectures were given during the summer session of 1924. New York University's experience in broadcasting has been limited solely to the giving of radio talks. Early in its experience it was apparent that some instructors who were excellent in the classroom were not suitable for broadcasting through the medium of the "micro." The public speaking department was created to play and speech laboratory developed for the primary purpose of correcting errors in radio speaking and announcing. A mechanism was developed by two members of the staff, whereby the speaker could hear his own voice over the ether; and in this way errors and difficulties not otherwise apparent were brought to the attention of the speaker himself.

Series of lectures, numbering five or more, have included such subjects as psychology, geometry, physics, archaeology, economics, evolution, contemporary literature and drama, and various commercial subjects. To the surprise of many, one of the most favorable reactions of the radio audience was to the series of talks on archaeology.

As a pioneer in the field of educational broadcasting New York University expects to continually benefit from its past experiences and constantly widen its effective sphere in education as a result of them.

The programme of "air college talks" has been arranged on the basis of requests and suggestions received from thousands of listeners last year. In addition to this, the director has consulted those in charge of educational broadcasting in other universities and foreign countries, particularly England. As a result of these discussions, and the suggestions made in the letters, a programme of lectures in radio has been arranged. The whole programme is being developed with the idea of furnishing a balanced group of talks through the entire school year. They will be designed to cover many subjects of universal interest, but always attempting to provide each week subjects of different character, so that the entire radio audience will find something of interest in each week's programme, although it may be interested in everything that is given. Thus a series on science is placed, to be given at the same time as a series on literature or the drama, while the third lecture may include a business history or economics. In addition, the programme is designed to present subjects of timely interest.

During the fall, when the crisp weather makes the outdoor walks of interest to many city dwellers, a series on geology, or the stories that rocks which are seen on daily walks tell to the geologist, is to be given. In the spring, when the outdoor walks are in bloom, a series on the history of the flower, and when the fever for foreign travel is at its height a series of travel talks, together with some language lectures in French are planned.

The programme of the programme is the special series of talks coming periodically once a month throughout the year. Of such a nature is the series on vital problems to be given by prominent men outside the university. The first of this series was given by Ralph M. Easley, the chairman of the American Civic Federation. Others planned in the series are to be announced at a later time. Of the same nature is the series on "High Light in World Affairs," a discussion of current international relations by Professor Charles Hodges. With this series the opportunity is given for the "radio listeners to obtain a graphic map of the world from year to year in the Mediterranean. He will tell how the modern historian goes to the home of foreign people to obtain an accurate idea of their life and political movements. This series is scheduled to begin the first of January.

In addition to such talks, the College of Dentistry in the university has agreed to provide two dental health talks each month, beginning Dec. 27. The first of the programme are planned for the second semester, beginning on Feb. 1.

A new development is to be undertaken within the next two months when the university will provide a women's hour at 11 o'clock each Wednesday morning, devoted entirely to problems of the home which are of interest to women. Talks on home budgeting, historical styles of decoration, furniture design, dress design, and other topics will be discussed by experts from the Department of Fine Arts and the Department of Home Economics.

ON AERIALS

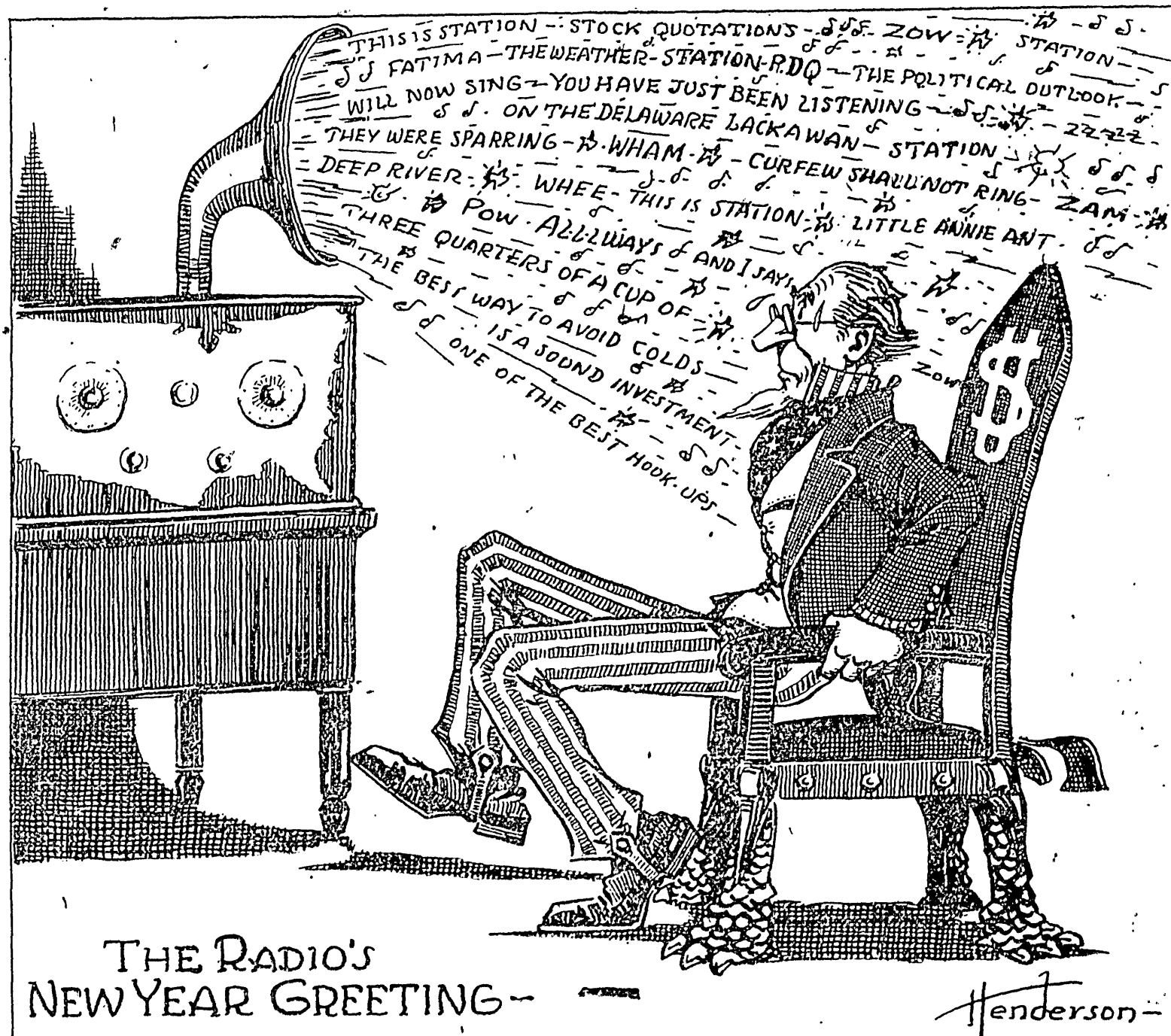
Most Satisfactory is Outdoor Type High Above House or Trees.

An aerial about 50 feet high, swinging outside the house, clear of trees, buildings or other obstructions, will in the majority of cases give the best results with a given set. As the length of the aerial is reduced or its height above obstructions is lessened, the results are weaker. If an aerial is strung inside the house the results will be somewhat inferior to what they would be with the same aerial outside. If the length is cut down and the wire wound around the walls of the room instead of strung it full length, the results will be still less. If a loop is used, the amount of energy picked up will be less than that picked up by a wire strung in full length. A loop, however, occupies less space, and, with the smaller pick-up, the signals are going to be weaker.

USE FOR WORN-OUT BATTERY.

A worn-out dry battery is good to burn in coal furnaces. In addition to burning rapidly, it acts as a cleaner for the flue, as the burning chemicals in the battery form a composition of gases which reacts upon the soot in the pipes.

SHORT CIRCUITS



THE RADIO'S
NEW YEAR GREETING—

RADIO ENGINEERS SHOULD BE HAPPY

Field by No Means Exhausted. Says Corporation Head

Despite Development in Apparatus and Broadcasting Achievements, Much Remains to Be Learned. David Sarnoff Tells Students of St. Lawrence University.

Radio to-day offers one of the broadest fields for research and development in all engineering lines, according to David Sarnoff, Vice President of the Radio Corporation of America. Mr. Sarnoff believes that it has by no means approached its limit and that even as highly developed as it is today it is still in its infancy. Young men training for radio engineering have every assurance of much work for the future, he is opinion.

In a recent address to the students of St. Lawrence University, Mr. Sarnoff said, in part:

"It is true that the building of a transmitting or broadcasting station and the construction of a radio receiving set have become matters of practical engineering and precise manufacture. We also know that electrical energy generated at a given frequency can be radiated in the form of electrical waves which travel in every direction. We know, too, some of the laws that govern the effective detection and utilization of such electrical signals, and we have developed methods of amplifying these signals till they reach an audibility satisfactory to the human ear.

But the science that governs the propagation of electro-magnetic waves over the earth and through the air we know little. In this field we encounter a bewildering haze of theory. Much further scientific investigation is required before the problems will be solved.

"We know that with the same given power at the transmitting station we can cover greater distance over salt water than we can over land, or can in general cover greater distance over flat land than over hilly country, over moist land than dry land. We have noted the absorption of wave energy by the atmosphere in the earth. But the fact remains that our understanding of the physical phenomena involved has made comparatively little advance over the theories formulated by Faraday and Maxwell. The field for exploration there is as wide as the art of radio itself.

"We are just beginning to glimpse the possibilities of short-wave transmission—that is, transmission with wave lengths of ten meters or less. But here again we are faced with puzzling phenomena. We find, in some instances, that reception is good at a point 2000 miles from the transmitter and very poor at a distance of 200 miles. We are able to receive extraordinary ranges with low-power wave transmission, but often are unable to communicate over comparatively short distances. We find, in other cases, that to cover distance in given direction we have length must be used, and to cover an equal distance in another direction a different wave length is required. A wave length

which gives excellent results in long-distance daylight transmission does not always give the same results in transmission after dark.

The great technical problems of radio communication are the interference and fading. We have discovered many palliatives for these ills but no cures," continued Mr. Sarnoff.

"Beyond the highly selective methods of reception already adopted, the greatest hope of solving the problem of interference, that jumble of transmissions from signals from different stations, lies in the further exploration of short-wave transmission. Short-wave length permits to open up not only new paths for wave propagation by a large number of useful communication channels. Consider the almost all the long-wave trans-Atlantic telegraph stations in the world crowded into a frequency band about 15,000 cycles wide, whereas the available short-wave field below 100 meters includes approximately 30,000 cycles, and you will have some indication what the future may bring forth in the way of additional radio communication facilities.

"More fundamental discoveries with regard to the handling of light waves and electro-magnetic waves must be made before telecommunication, the art of transmitting instantaneously changing scenes and moving objects, can be considered an accomplished fact. The vista which such a period of development would open up, especially in the realm of higher education, is inspiring indeed. To the power of exploration now inherent in sound broadcasting would be added the power of demonstration made possible by the broadcasting of sight.

"The application of radio to the photograph industry, as well as the application of electric principles to other industrial purposes, opens an almost limitless field to the electrical engineer.

"In fact, from whatever angle radio is viewed, the great opportunities are before, not behind. It has created a multitude of new problems which cry to be led out of the wilderness."

CONDENSER TESTS

Simple Operation baffles Many People Although Extremely Easy. The majority of people do not know how to test a condenser for open circuit, but it is a simple matter to test for a short circuit, and it is also about as simple to test for the open circuit too.

In testing for a short circuit the condenser should always be disconnected from the set because a tuning coil, audio frequency transformer, or radio frequency transformer and the coil of wire used as a continuity test, which means a short circuit if the condenser was tested by itself.

The same holds true when testing for open circuit in a condenser. If the capacity is high, such as one microfarad or more, it may be tested with a battery and voltmeter connected in series and the terminals touched. When this is done, there will be a deflection of the voltmeter and when the wires are reversed, there will be a deflection in the opposite direction. This shows the condenser to be O. K., but if you do not get the deflection, it is open.

RADIO PROGRAMMES

WJAR presents to-night at 7:20 the Sunday evening concert of the Capitol Theatre, 9:15 p. m. at the Water Kent hour, featuring Louise Homer, soprano, and Louise Homer, soprano, and at 10:15 p. m. a talk by Donald B. MacKay, Architect.

At 10:30 p. m. piano duets will be given by Julia Fiske and Gladys E. A. Smith, and at 10:45 p. m. the grand opera "Rigoletto" will be heard. Tuesday at 7:50 p. m. a historical talk will be given by Herbert Goodrich Beede, under the auspices of the Rhode Island Society of Sons of the American Revolution, and at 8:30 p. m. a recital by Edith Woodhead Marshall, soprano, and Frank Page Burdette, Wednesday, in addition to the regular numbers, the Honolulu Four will be heard at 7 p. m. and Thursday will be devoted to the regular programmes. Friday at 8 p. m. a lecture from Temp Beth-El will be broadcast, and at 9:05 p. m. Eddie Casey and his orchestra will be heard. On Saturday at 1:05 p. m. musical selections will be given by Al Williams and his Harmony Boys.

WEAF broadcasts to-day at 10:45 a. m. services of Temple Beth-El, Boston; a programme by the Boston Square and Compass Club at 4 p. m. an organ recital at 6:30 p. m. and services of the Mathewson Street M. E. Church at 7:30 p. m. To-morrow the regular schedule will be followed. On Tuesday at 7:30 p. m. a short talk will be given by Mrs. George C. Harrison, chairman of the Federation of Women's Clubs, and at 8:30 p. m. the play "Romeo and Juliette" Wednesday at 4:35 p. m. Arthur Guenther will be heard in piano and vocal selections, and at 8:30 p. m. the play "Miscegenation" will be given. Thursday, the regular programme will be broadcast, and Friday at 4:15 p. m. solos will be given by Jack Kelly. Saturday at 8 p. m. a concert programme will be relayed from Boston, and at 9 p. m. dance music will be broadcast.

WDWF will be heard to-day at 4:45 p. m. in the usual Sunday recital. WSLI will broadcast at 8:30 p. m. on Monday the Franklin Auto Supply hour, an on-air broadcast by the orchestra, Wednesday at 8 p. m. Miss Nancy Dyer will give her second talk on art, at 8:45 p. m. Thomas P. Peirce & Son will be heard, and at 9 p. m. the Billings Market hour. Thursday the Narragansett Hotel Orchestra's programme will be broadcast at 7 p. m. On Friday at 6:30 p. m. the Port Arthur Restaurant Orchestra will be heard, the radio directory will be given at 8 p. m., and at 9 p. m. music will be furnished by the Arcadia Ballroom Orchestra. Saturday the station will be silent.

WJAR—THE DILET CO.—483. To-day. 7:20 p. m. Musical programme by Mrs. M. J. and her orchestra, the Capitol Theatre. 9:15 p. m. A short talk, presenting the story of the life of St. Francis, by St. Francis, St. Francis, St. Francis. 10:15 p. m. The old M. McMillan, explorer, of the life of St. Francis, St. Francis, St. Francis.

Monday. 10:45 a. m. Housewives Radio Exchange, a department conducted by Mrs. Wood on all matters of household interest. All questions submitted will be answered by day. 1:05 p. m. Studio programme. 1:30 p. m. Weather report. 2:30 p. m. M. E. Army Band under the direction of Capt. W. J. Stannard, relayed from Washington, D. C. 8:00 p. m. "The Political Situation in Washington To-night," by Frederick William Wile, direct from Washington, D. C. 8:15 p. m. Salon concert. 8:30 p. m. Programme to be announced. Thursday. 1:05 p. m. Studio programme. 1:30 p. m. Weather report. 2:30 p. m. M. E. Army Band under the direction of Capt. W. J. Stannard, relayed from Washington, D. C. 8:00 p. m. "The Political Situation in Washington To-night," by Frederick William Wile, direct from Washington, D. C. 8:15 p. m. Salon concert. 8:30 p. m. Programme to be announced. Friday. 1:05 p. m. Studio programme. 1:30 p. m. Weather report. 2:30 p. m. M. E. Army Band under the direction of Capt. W. J. Stannard, relayed from Washington, D. C. 8:00 p. m. "The Political Situation in Washington To-night," by Frederick William Wile, direct from Washington, D. C. 8:15 p. m. Salon concert. 8:30 p. m. Programme to be announced. Saturday. 1:05 p. m. Studio programme. 1:30 p. m. Weather report. 2:30 p. m. M. E. Army Band under the direction of Capt. W. J. Stannard, relayed from Washington, D. C. 8:00 p. m. "The Political Situation in Washington To-night," by Frederick William Wile, direct from Washington, D. C. 8:15 p. m. Salon concert. 8:30 p. m. Programme to be announced. Sunday. 1:05 p. m. Studio programme. 1:30 p. m. Weather report. 2:30 p. m. M. E. Army Band under the direction of Capt. W. J. Stannard, relayed from Washington, D. C. 8:00 p. m. "The Political Situation in Washington To-night," by Frederick William Wile, direct from Washington, D. C. 8:15 p. m. Salon concert. 8:30 p. m. Programme to be announced.

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To-day's Programmes in Brief

For the convenience of radio fans, the following hourly schedule of broadcasting to-day is given in brief form, the complete programme being given under the regular listing of announcements. Figures following stations denote wave length.

The hours are based on Eastern Standard Time.

LOCAL STATIONS

10:45—Church, WEAF, 361.
10:50—Concert, WEAF, 361.
10:55—Recital, WJAR, 441.
11:00—Organ, WEAF, 361.
11:05—Sunday school, WJAR, 422.
11:10—Church, WEAF, 361.
11:15—Concert, WJAR, 422.
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United States Navy Maintains Radio Guard Over Ocean Lanes

Peace-Time Activities Afford Personnel Sufficient Sea Service in Hunting Icebergs, Derelicts and Assisting Ships in Trouble

By EMMETT DOUGHERTY

Reaching all corners of the seven seas through powerful naval radio broadcasting and receiving stations, the United States Navy Department has solved the question of safety of life at sea and has made possible the economical navigation of ships the world over.

Along the approaches of American coast, naval radio compass stations are guides to port for the fog-bound or storm-swept mariner.

This service of maritime security is carried on throughout each day and night of the year and, contributing to the development of aviation, has been extended to navigators of sea airways.

The problem of keeping the ocean lanes safe, simplified of late years by the widespread use of radio, is a joint one in which ships, both merchant and naval, contribute a large share.

The radio sea net gathers in for the Hydrographic Office messages of derelicts, of icebergs, of lighthouses rendered temporarily unserviceable by hurricanes, of buoys dragged by ice or storm from their charted anchorage, of naval landmarks demarcating the limits of the Hydrographic Office's jurisdiction.

Messages are rebroadcast immediately by the Hydrographic Office in warnings to that part of the ocean highway concerned. In addition, storm warnings and weather observations for mariners and sea aviators are sent out in co-operation with the Weather Bureau at Washington, and a daily time signal from the Naval Observatory is transmitted to navigators, so dependent on exact time in order to determine accurately their position at sea.

Merchant vessels and men of war almost half-way round the world are constantly receiving these safety-at-sea directions. A merchant vessel, for instance, southeast of Cape of Good Hope, Africa, reported hearing Hydrographic messages sent out from Washington. The American ship Sorbus, at Constantinople, reports receipt of navigational warnings and time signals from Washington.

Out on the broad ocean, mariners are constantly kept informed of floating obstructions dangerous to the safety of their ships. A ship sweeps the main and wreckage occurs. Wreckage or derelicts floating in transoceanic lanes of travel, either in a partly submerged or afloat condition, are the constant dread of mariners, especially at night.

Once reported to the Hydrographic Office, the location of these menacing obstructions is made known by radio. In addition, until drifting derelicts are removed, they are plotted on monthly pilot charts issued to mariners by the Hydrographic Office, so that future drifts of such menaces may be predicted by mariners themselves.

An unusual menace to mariners was let loose upon the Atlantic, July 12 of this year. Thirty-seven steel cylindrical pontoons, measuring about 20 feet in length and five feet in diameter, were lost from a barge which broke adrift from the tug Susan A. Mearns off Frying Pan Shoals, North Carolina, in the path of coastwise shipping. The news was relayed to the Hydrographic Office by radio from the tug to the branch Hydrographic office at Norfolk, Va., and was immediately broadcast from Washington to Atlantic mariners.

A sheet of messages over an inch and a half in depth (and these messages written on onion-skin paper) concerning the pontoons are on file in the Hydrographic Office. These include reports received from merchant masters stating the location of one or more of the pontoons and subsequent broadcasts of the Hydrographic Office. The coast guard, closely following these broadcasts, has been able to track down and destroy the gunfire of these rolling, drifting pontoons. They are particularly hard to remove from the path of shipping is revealed by the fact that the coast guard cutter Mojave was com-

pelled to expend 11 rounds of six-pound ammunition before its pontoon target sank. Invariably, as the sheet of messages grows, the reports state that the "large, cylindrical objects" are becoming coated with rust and marine growth. Gradually the main pontoons have drifted to the north and east under the influence of the Gulf Stream. The pontoon sunk by the Mojave on Aug. 25 was 500 miles north and east of the spot where it had gone adrift.

A 10-day search by United States naval ships for a bulky dangerous target, got raft which had to be temporarily abandoned off Eleuthera Island, the Bahamas, during the hurricane of Sept. 18 was ended by a report from a merchant ship of the raft's position. This raft, measuring about 150 feet in length and 15 feet in width, with a deep draft, showed but intermittently above the surface of the waters and was a matter of concern to the Navy Department as well as to mariners travelling the much used route to the eastward of the Bahamas.

The mine sweeper Rait, which had been towing the raft to Guantanamo Bay for use in target practice by the scouting fleet, reported the raft's position as she put into San Salvador to accomplish an emergency repairs from damage wrought by the hurricane. Six days later the raft was first sighted by a merchant ship, the steamship Oradell, and the commander of the scouting fleet at Guantanamo Bay sent a light cruiser division of destroyers to search in the area reported.

After two days march in this area the raft was not located. On the following day, however, a complete description of the submerged raft, its location and its probable direction of drift was radioed to the Hydrographic Office by the Canadian Forester, and rebroadcast from Washington. As a result, the Rait reached the position, took the cumbersome tow in charge and ended the 10-day period of worry by sending the time message "Raft at Eleuthera Island for Guantanamo Bay target raft in tow." The shipping world in the north Atlantic was notified and went on its way relieved.

Many derelicts have drifted across the Atlantic ocean; others have drifted aimlessly at the beck of the wind and current. The longest duration of derelict drift on record in the Hydrographic Office is that of the American schooner Fannie E. Wolston, abandoned off the coast of Virginia in October, 1891. Carried by the Gulf stream and westerly winds, the abandoned ship drifted eastward to the 40th meridian, then was set southward and again eastward for months, finally was swept up again by the Gulf stream and was last seen, in October, 1894, a few hundred miles to the northward of the position where she had been abandoned three years before. The track of this derelict in her aimless wanderings, as recorded in the Hydrographic Office, totalled some 8995 miles.

The most notable drift in recent years was that of the British four-masted lumber-laden schooner Governor Parr, which was abandoned practically dismantled on Oct. 2, 1923, to the southward of Newfoundland and drifted eastward in the path of transatlantic shipping. On Jan. 2, 1924, the Coast Guard cutter Tampa picked her up to the eastward of the Grand Banks and attempted to tow her to port, but after a day or two of heavy weather was obliged to abandon her. After this the schooner drifted eastward again and in October, 1924, appeared between the Canary Islands and the African coast, having drifted in that time almost half-way around the Atlantic ocean and having been sighted a number of times and once boarded and set on fire.

In the wide lanes of steamer travel between Europe and America, the radio

ANNOUNCER HAS EXACTING WORK

Much of Station's Popularity Depends Upon Him

Clear, Pleasant Voice and Perfect Enunciation Essential—Talker Must Grip Listener's Interest or He Tunes Out—Letters from Fans Add Inspiration.

One of the most difficult and exacting of jobs in the entertainment field is that of the radio announcer. He must possess a clear, pleasant voice and perfect enunciation. He must grip the listener's interest or he will be tuned out. Letters from fans add inspiration.

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better than the talk you are giving, or at least more entertaining, that with a slight motion of the dial you are gone and probably forgotten. The sustaining of interest is best likened to running a quarter of a mile, the distance in just short enough so you have to run at almost full speed the entire way. So you must sustain interest in your talk from the very beginning to the end—the slightest lapse and you lose the listener—he shuffles the dial and you may have an excellent subject in which you have been properly inspired, you may be thoroughly posted, and you may develop it in the right sequence, but will the public be interested? How can you sustain the interest? In my talks I endeavor to break the talk at definite points and introduce something of a poetic nature, something which has a humorous slant to it, or something concerning a real human interest experienced.

"With regard to transmission I find that it is desirable to read the talk ahead of time and listen to your voice as you read, to see that you are speaking distinctly, slow enough, and that you are carefully enunciating each word. Although the talk is read you must read it with the right emphasis, putting enough of your personality into it, so that the listener will not know you are reading. Then you must learn to read without choking, without gasping or rattling your paper, and you must not breathe too hard. The microphone is so sensitive that everything is sent out. It is well to hold your paper up to your read, for if you do not, the listener will know you are reading. Keep your mouth in a direct line with the microphone so you talk direct at it.

"If you talk at an even pitch, not fluctuating your voice between too great a range, the man in the control room can control it to the best advantage. Do not drop your voice too abruptly at the end of sentences, or it will fade out. Do not get too much hushing sound. Any word you find in practicing aloud that bothers you, and which will not read easily, discard. Remember that every word that can be eliminated, eliminates it just so much time to transmit, and if it does not help the talk, discard it. Brevity is the soul of wit—particularly with a radio audience.

"Radio talks should not be too long—between 10 and 12 minutes is ample. Where a talk is in two parts, and music

is used before and after the talk, and as a background to part of the talk, it may extend to a maximum time of 18 minutes including the intermission and interludes."

TEST FOR STORAGE BATTERY.
A hydrometer syringe is best for testing the condition of storage batteries. The rubber hose is placed in the battery solution, the rubber bulb compressed and when it returns to normal, enough battery solution is drawn into the glass tube to float the hydrometer. The latter is graduated from 1000 to 1300. About 1175 is discharged and 1280 to 1300 fully charged. It is a good plan to not let the gravity of the solution get below 1200.

AN ASSET TO THE RECEIVER.
A counterpoise is one way to help eliminate electrical interference caused by street car lines, X-ray machines, etc. Most of this type of interference comes via the ground; the counterpoise acts as a ground and is usually used as such on transmitters where all possible sources of interference must be eliminated. A counterpoise can consist of two lengths of stranded enamel wire, each the same length as the aerial and placed, if possible, about nine feet above the ground directly over the aerial.

SHOCK ABSORBERS.
Air cushions as shock absorbers for receiving sets are among the most recent developments of radio engineers. It is claimed that the use of these cushions will eliminate vibrations, aid materially in undisturbed tuning, improve reception and reduce to a minimum microphone noises. They insulate the set and prevent fine vibrations from becoming scratched. They are quickly and easily installed and no fastening is required.

DRILLING HOLES IN PANEL.
When drilling a hole in a bakelite or hard rubber panel, first provide a starting point by drilling the hole with a center punch. Without such a punch mark the drill will "walk" all over the panel, no matter how carefully the drill is held.

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GOOD HEALTH LUNCH
No. 2 Snow St.

Marshall & Co.
Where They Know The Sentiments
R-A-D-I-O Exclusively
94 OUN. NARRAGANSETT HOTEL

Steinitz Long Distance Crystal Set

World's Best Radio Value—
Everyday and every night be happy with a Steinitz Crystal Set—no batteries, no tubes, no expense. The Perfection of Simplicity. Loud, clear reception. Less trouble with static. Finest Tone.

Free 10-Day Trial
NO TUBES or BATTERIES NEEDED.

Thousands of fans write of bringing in distant stations and concerts by remote control. Equipped with Steinitz Sensitivity Crystals. Beautifully finished cabinet, large dial, low power, low variable condenser, low resistance. Use if not entirely satisfied, money promptly refunded. Order Today!

The New Steinitz 7-Tube Radio—no batteries of any kind—only \$125. Loud Speaker built in. Complete with table 100-pointing to buy. Operates from light socket. 7-Tube Battery Set \$45; Aerial Eliminator \$1; Interference Eliminator \$1; Noise Eliminator set of five for \$1; crystals 50 cents each. Three for \$1.

STEINITE LABORATORIES, 108 Radio Bldg., ATCHISON, KANSAS

There Are No Real Radio Bargains

YOU buy a radio set for what it will give you; you get what you pay for—no more, no less.

Poor radio reception is worse than none. Why not start right? After the first thrill of "getting something on the air," comes the desire to get true "quality" reception from home stations as well as from others farther away. If you have bought right, you'll have no regrets. And "buying right" means buying a Grebe Synchronphase, for with it there are no handicaps as to tone, selectivity or distance.

The exclusive Grebe features, developed after seventeen years of building radio sets, provide a reception that is as superior as it is unusual. And this quality is permanent—you will never have to "scrap" a Grebe.

Ask any owner of a Grebe set what he thinks of it. Then let us put one in your home on approval. Convenient terms can be arranged.

The GREBE SYNCHROPHASE
TRADE MARK REG. U.S. PAT. OFF.

Authorized Dealer
Radios and Equipment Sold on Easy Terms

R.I. ELECTRICAL EQUIPMENT CO.
MAZDA LAMPS • FIXTURES • APPLIANCES • CONTRACTING
45 WASHINGTON ST. INCORPORATED 1892 PROVIDENCE, R.I.

SALESMEN WANTED

To Sell Electric Washing Machines. Exceptional opportunity for those who can qualify. Experienced men given preference. If you have not had experience in this line we will train you.

Apply Monday 9 A. M. at Washing Machine Store—Third Floor

THE SHEPARD STORES

Joseph Vincent Tally
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is now associated with his Father

JOSEPH M. TALLY

506-512 WESTMINSTER STREET
BOOKS AND CHURCH GOODS
European Steamship Ticket Office

The Employees of
GEO. L. CLAFLIN COMPANY

thank them for their kind wishes and gifts of gold at Christmastide.

We wish them the utmost in health, happiness and prosperity during the year 1927 and many years to follow—

THE EMPLOYEES
GEO. L. CLAFLIN COMPANY,
Providence and Attleboro

THE CLEAN SLATE FOR 1927

What Will You Write Upon It?

A. Coin Book Bank Spells Success.
We Will Lend You One.

Rhode Island Discount Corporation
1414 Turks Head Bldg.—Providence

SUNBEAM ONE-PIPE FURNACES

A Most Useful New Year's Gift For The Home

Burns wood or coal and will heat your home to 70 degrees in zero weather—now is the time to buy and enjoy it this winter. Free installations at once.

Priced from \$149.00 Up
VERY EASY TERMS

John M. Dean Co.

785-795 Westminster Street

Many Progressive Fans Seek Elimination of Grid Battery

Radio Engineer Tells How Operation May Be Effected With Little Trouble, Results Satisfactory.

Bell Transformer Used

By HORATIO W. LAMSON.

After the radio fan has banished the need for "B" batteries by the use of some form of plate supply or "B" eliminator he becomes seized, perhaps with the desire to do away with the "C" batteries, especially those of relatively high voltage required to bias the power tube in the last stage of the audio amplifier. If the plate supply outfit is capable of providing an over-all voltage equal to the normal plate voltage of the tube plus the required grid-bias voltage, this may readily be accomplished, provided a separate source of power is at hand for heating the filament of the power tube.

The circuits and arrangement for doing this are indicated schematically in the figure. PS represents the terminal panel of a typical plate supply unit. PT is the power tube in question, for which T1 is the customary input trans-

former. SF is a speaker filter in the plate circuit of the tube to keep the grid current from passing through the loud speaker LS. This filter may consist, perhaps, of a 30 henry choke coil in conjunction with a 200 ohm resistor. It may be replaced by an output transformer which will serve the same purpose.

The ordinary bell-ringing transformer, T2, connected to the A. C. house mains, may be employed to heat the filament of the tube, using a suitable

rheostat, Rh, to control the filament voltage. In this way no storage battery is required for the power tube, which makes it possible to add a stage of power amplification directly to radio set employing only electrolytic tubes. The circuit across the filament terminals are connected two resistances in series, R1 and R2. These may be from 30 to 50 ohms each. Their exact value within this range is immaterial, but it is essential that they be closely equal to each other so that their center point is "equally distant" from the tube filament terminals. Between this center point and the B terminal of the plate supply a third resistance, R3, is connected. This is known as the "biasing resistance" and it should be directly shunted with a condenser "C" of 1 MF capacity. (Note—R1 and R2 may be a 200-ohm potentiometer).

Examination of the figure will show that the plate emission current of the tube is obliged to pass through the resistance R3, and that the location of the grid return is such that the grid will be biased negatively with respect to the centre of the filament, by a voltage very closely equal to the IR drop of the plate current through the resistance R3. In other words, the tube is biased by its own plate current. This is advantageous in that any change in plate voltage is compensated by a proportional variation in grid bias, thus maintaining automatically the correct relation between the two.

The by-pass condenser, C, is desirable to reduce the A. C. coupling between the grid and plate circuits of the tube, due to the resistance R3, which is common to both circuits.

The value of the biasing resistance depends, of course, upon the tube used and the voltage available at the plate supply terminals. By inserting a milliammeter at A the bias may be computed or it may be measured directly by means of a high resistance voltmeter connected across the terminals of R3. If desired, this resistance may be an adjustable unit having an operating range of 500 to 6000 ohms.

In general, it is not advisable to attempt to bias any but the last stage of the amplifier in this manner. Other tubes requiring a biasing battery should be provided with dry cell units. These tubes rarely require more than a few volts, which may conveniently be supplied by flash light cells, since they supply no current, will last throughout their normal shelf life.

Diagram of Lamson Scheme to Eliminate Grid Battery

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During the latter part of the summer of 1926 a gas and whistle buoy at Matanilla Shoal, which lighted and sounded its warning at the northern tip of the Buoy, was blown away from its position, with its heavy anchor and chain attached. This news was broadcast by the Hydrographic Office. The buoy was carried into deeper water and about the middle of September was recovered 200 miles southeast of its original position, by the lighthouse tender Cypress, with a saving to the Government of \$7500.

REDUCING INTERFERENCE.
Interference can be reduced greatly by substituting a counterpoise for the usual water-pipe ground connection. This is done by running a wire around the room over the moulding, about 50 feet, and connecting the end to the ground terminal of the set.

RADIO PROGRAMMES

Continued from Page Six

12:30 p. m.—"Atwater Kent hour."	8:35 p. m.—"Getting Acquainted with Beethoven."
1:00 p. m.—"Concert programme."	8:50 p. m.—"String orchestra."
1:30 p. m.—"Weather forecast."	
2:00 p. m.—"WMAK—NEW YORK—275"	
2:30 p. m.—"Turner's symphony orchestra."	10:25 a. m.—"First Presbyterian Church of Lockport."
3:00 p. m.—"WMAK—NEW YORK—275"	2:00 p. m.—"Musical programme."
3:30 p. m.—"Concert of sacred music."	7:50 p. m.—"First Church of Christ, Scientist."
4:00 p. m.—"Selections from the Bible and Science and Health with Key to the Scriptures by Mary Baker Eddy, read by Augusta R. Stee, D. C. S. D."	10:20 p. m.—"Concert."
4:30 p. m.—"Organ recital, Mary Day Plummer."	
5:00 p. m.—"WMAK—NEW YORK—275"	
5:30 p. m.—"Service, Chelsea Baptist Church."	10:30 a. m.—"Christian Science services."
6:00 p. m.—"Service by Rev. Harold Garfield Gaunt."	12:15 p. m.—"Gloomchasers."
6:30 p. m.—"Service, Chelsea Baptist Church."	1:20 p. m.—"Concert."
7:00 p. m.—"An hour with the classics."	2:40 p. m.—"Musical."
7:30 p. m.—"WMAK—NEW YORK—275"	3:30 p. m.—"Chinatown Rescue Society services."
8:00 p. m.—"Service of the Fourth Avenue Presbyterian Church."	5:00 p. m.—"Musical."
8:30 p. m.—"Church evening services from Oak Church Cathedral."	5:30 p. m.—"Solists."
9:00 p. m.—"WMAK—NEW YORK—275"	6:00 p. m.—"Concert."
9:30 p. m.—"Service from Park Street Congregational Church."	7:00 p. m.—"Orchestra."
10:00 p. m.—"Concert programme."	7:30 p. m.—"Broadway chat."
10:30 p. m.—"Service from the United Congregational Church."	8:00 p. m.—"String ensemble."
	8:30 p. m.—"Musical."
	9:00 p. m.—"Moment musicals."
	10:00 p. m.—"Orchestra."
	10:45 a. m.—"Service from Temple Israel."
	1:00 p. m.—"Concert orchestra."
	4:00 p. m.—"Gordon Square and Compass Club."
	6:30 p. m.—"Coplay Plaza Concert Orchestra."
	7:50 p. m.—"Service from Park Street Congregational Church."
	2:00 p. m.—"Old folks musical programme."
	7:30 p. m.—"Church service, First Methodist Episcopal Church."
	9:15 p. m.—"Atwater Kent hour."
	10:45 a. m.—"Service from Bethany Presbyterian Church."
	2:30 p. m.—"Sunday school."
	6:00 p. m.—"Organ recital, Clarence K. Bowden at the console."
	4:30 p. m.—"Studio programme."
	6:00 p. m.—"Studio ensemble."
	7:45 p. m.—"Feland Gannon, baritone."
	7:55 p. m.—"Michael Lambert, cellist."
	7:55 p. m.—"Concert."
	5:15 p. m.—"Community recital."
	4:15 p. m.—"Concert orchestra."
	8:00 p. m.—"Last-minute news flashes."
	9:15 p. m.—"Concert orchestra."
	10:00 p. m.—"Musicals in the high school auditorium."
	11:00 a. m.—"Church services."
	4:00 p. m.—"Services from Washington Cathedral."

OFFICIAL DESIGNS DIRECTION FINDER

Device is Portable and Easy to Operate

Bureau of Standards Man Produces

Finder Said to Cover Band from 30 to 3300 Meters.—Tuned by One Control and is of the Simple Rotating Coil Type.

F. W. Dunmore of the Bureau of Standards is credited with effecting the development of a portable radio direction finder which will function over a wide band of frequencies and is comparatively simple in operation. Mr. Dunmore was moved to work out such an apparatus by the steady increase of wave lengths used for radio transmission purposes. His finder, it is claimed, will operate successfully over bands from 30 to 3300 metres.

In Mr. Dunmore's finder a shielding aluminum box contains all the receiving apparatus, including batteries, with the exception of the direction-finder coil which is supported on a bakelite shaft extending through the box and rotated by means of a hand-wheel under the box, says the New York Times.

The direction finder is of the simple rotating-coil type. Automatic features are provided so that only a single

tuning and a single balancing control are used. The receiving set is a super-heterodyne which employs a standard Signal Corps amplifier and reduces the controls to a single one by mounting the main tuning condenser and the heterodyne generator tuning condenser on the same shaft. The latter condenser has been connected in parallel with it in an auxiliary condenser of slightly smaller capacity operated by means of a cam which may be slipped on the shaft carrying the two tuning condensers.

The wide wave range is made possible by a set of seven interchangeable plug-in direction-finder coils, each with a corresponding heterodyne generator coil and a cam for operating the auxiliary tuning condenser. Another automatic condenser is connected in parallel with the main tuning condenser. Its function is to compensate for the detuning effect produced at the higher frequencies when the balancing condenser is operated. The centre of each direction-finder coil is grounded to the shield when in use. A small telescoping brass rod extending vertically through the centre of each direction-finder coil, connected to the movable plates of the balancing condenser, serves as an auxiliary antenna for the purpose of sharpening the point of minimum signal.

CONE NOISES

Daub of Rubber Cement Around Needle Shaft Stops Trouble. Apply a small daub of rubber cement around the needle shaft of the cone speaker it has developed a buzz or rattle that is especially noticeable on fairly weak volume. Use the kind of cement that remains semi-flexible after drying thoroughly, and place it at the

point of connection of the needle shaft with the cone tip. On the front side back off the small nut on the shaft end enough to allow the cement to coat its surface, and dry before tightening the nut, forming thus a rubber washer. After tightening the nut, apply one more coating of cement over the nut and shaft end. Do not tighten the nut more than necessary, otherwise it is possible to cut through the first coating. Glue will work satisfactorily for the volume usually required for best reproduction with cone speakers, but rubber cement is superior when low volume is desired.

CHOICE OF A NEW TUBE

When buying a new tube for the set, remember that it must be of a certain type to fit the sockets. Find out the current consumption, and ascertain if it will simplify radio frequency signals as well as audio frequency. In the event of the tube being paralyzed, see if it can be reactivated.

DEALERS! ATTENTION

Telephone Gaspee 6523 for Radiotrons, Tungars and

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Radio Batteries—Flashlights—Prompt Delivery—Fresh Stocks—Union Electric Supply Co. 60 Pine St., Providence, R. I. WHOLESALE ONLY

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RADIOLAS

(Association of World's Greatest Electric Companies)

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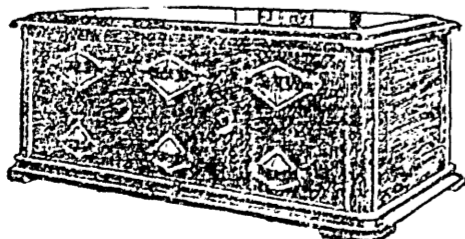
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SPECIAL NOTICE TO GREBE OWNERS AND PROSPECTIVE OWNERS

Furthering the policy of the Grebe Co. to give the **UTMOST** in service—THE A. H. GREBE CORP. ARE SENDING AN EXPERT FACTORY ENGINEER TO PROVIDENCE. He will be in our store Wednesday, Thursday and Friday of this week and will be available at any time during the day or evening for consultation or advice. FURTHER HE WILL INSPECT ANY GREBE INSTALLATION AT YOUR HOME as far as his limited stay will allow. If you desire his services please notify us as soon as possible. This innovation of direct factory to consumer contact will be maintained periodically. MAINTENANCE OF MODELS AND PRICES ARE ALSO GUARANTEED by the A. H. Grebe Corp. In the event of a reduction in price one year from the purchase of the set the difference will be refunded to the customer. If improvements are added to the set — six months from the purchase—THE CUSTOMER WILL RECEIVE A NEW SET FREE OF CHARGE. After this period a nominal charge will be made for remodelling. NO OTHER MANUFACTURER OF RADIO SETS IN THE COUNTRY PROTECT THE PURCHASER FROM OBSOLETE MODELS and GUARANTEE VALUES TO THIS EXTENT.

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These Sets, Properly Equipped and Installed will give the finest Radio Reproduction ever heard—they incorporate everything that is now known in Radio. NOTHING MORE CAN BE ADDED.

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The Freed-Eisemann Was the First High Grade Radio Set

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But—Reduced Prices Are Now Possible because great popularity and steadily increasing demand have resulted in immense production, thus permitting lower prices.

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Mellow and true is a result of the built-in tone chamber of violin-wood.

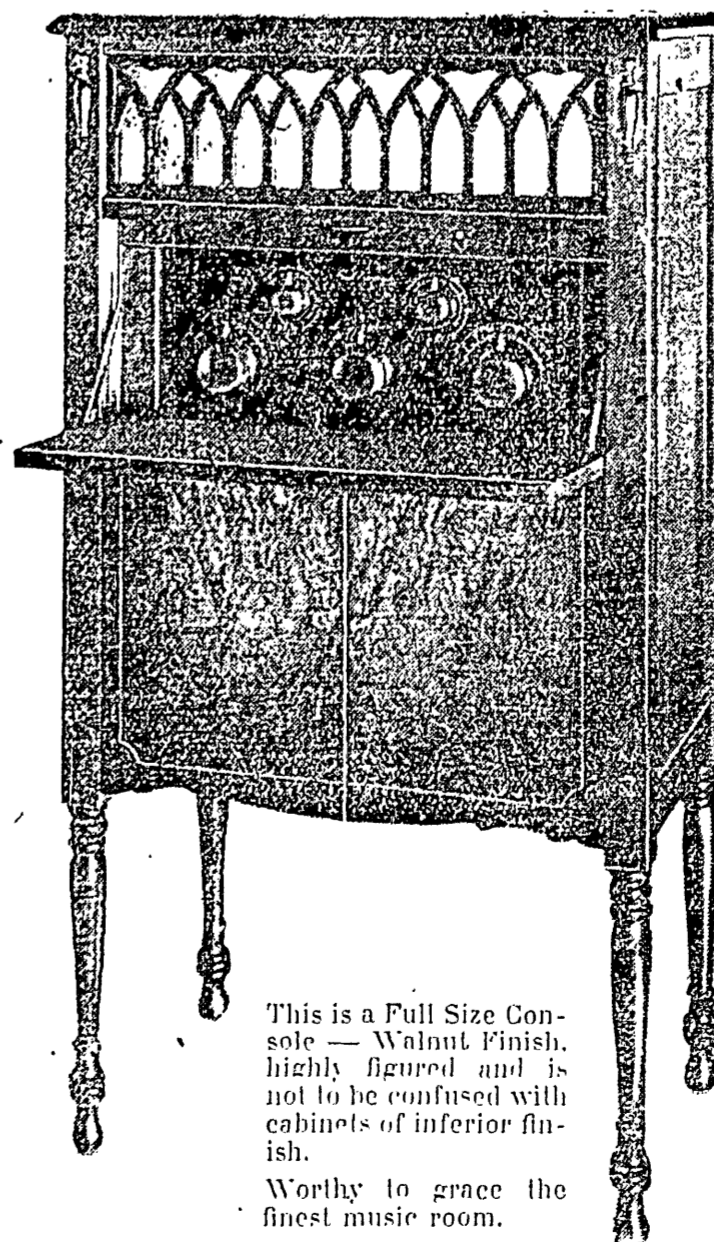
In Luxurious Homes

Where only the finest musical instruments are welcome; irrespective of cost you will find the Freed-Eisemann. Where cultured people discriminate between mere noise and true tone the choice is Freed-Eisemann.

The Freed-Eisemann

was selected by the U. S. N. for the President's yacht, the Mayflower. Despite the many fine European radios exhibited, it was a Freed-Eisemann which won the gold medal at the International Radio Show in Florence, Italy.

When you can get a magnificent Freed-Eisemann and finest equipment for a price like this don't take chances with an "Orphan" radio whose manufacturer has gone out of business so that parts have become obsolete and there is no one to guarantee satisfactory results.



This is a Full Size Console — Walnut Finish, highly figured and is not to be confused with cabinets of inferior finish.

Worthy to grace the finest music room.

These High Grade Accessories

To completely equip this \$34.00 set, only \$34.00 Extra

5 Cunningham CX301A Tubes
1 Westinghouse Rubber Case 100-Ampere Storage Battery
2 45-Volt Beacon "B" Batteries
1 4 1/2-Volt Beacon "C" Battery
1 Antenna Outfit

These Accessories Are Tested and Approved by the Fleetwood Laboratories of New York City

Besides All This—Installed in Your Home, Free in city limits.

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