

P. R. SHOW TO BE BROADCAST

STUDIO SET TO BE MOVED INTO AUDITORIUM

Plans for daily programs to be broadcast from the Civic auditorium during the Pacific Radio exposition, Aug. 16 to 21, inclusive, were announced today by William P. Bear, manager of the show, coincident with the appointment of KPO, Hale Bros. station, as the official broadcasting station.

Bear stated that the studio equipment of KPO will be moved to the auditorium and installed on the main stage, where the apparatus and performing artists will be in full view of visitors to the show. It is planned to operate the studio so that fans throughout the country will be able to hear the applause of the crowds as well as hear the artists. The public address system of the building also will be brought into play to carry the programs over the auditorium.

A series of elaborate and novel stunts is now being arranged by the executive committee of the Pacific Radio Trade Ass'n, of which A. S. Lindstrom is chairman. These stunts also will be broadcast.

Plans virtually are completed for the exposition.

Nearly all exhibit space at the show has been contracted for and the money paid in, assuring the success of the exposition, Lindstrom said. Virtually every type of radio receiving set as well as various accessories will be shown. Booth structures are nearly completed and an elaborate decorative scheme, featuring radio, has been worked out.

More than 100,000 persons, including hundreds of trade leaders and technical experts from throughout the United States are expected to attend the show. Daily trade meetings will be held on the mornings of the six days, afternoons and evenings being devoted to the public. A special train, known as the "Pacific Radio Convention Special," will leave the east the week before the show, while another train is planned to bring Southern California trade members.

Put Pad Under Dial

To prevent scratching of the panel by a dial, set close to it, put a soft felt pad between the dial and panel. The result is not only prevention of scratching, but lack of any noise in turning the dial.

Voltmeter Handy

A voltmeter is especially useful to check up on the strength of the B and C batteries, where several tubes are used and the drain on plate voltage is high. The storage battery is tested by a hydrometer.

Detroit Cops Catch Crooks In Radio Car

Burglars and crooks of all types have to watch their step in Detroit, since the advent of radio equipped police automobiles in that city.

The automobiles, which are capable of a speed of 80 miles an hour, are in constant touch with the police broadcasting station KOP on a wave length of 236 meters.

Three separate gangs of hold-up men have been caught through the use of these cars. Since the advent of radio cars Detroit police have materially lessened hold-ups, owing to their ability to arrive on the scene of a crime within a few minutes after receiving the information broadcast from KOP. In each of the instances mentioned above, a telephone alarm to police headquarters was promptly broadcast by radio to

the police cars, and in all three cases they arrived in time to apprehend the criminals.

In outward appearances there is nothing to show that the automobiles are unusual. This is due to the concealed aerial. The windshield is seven-eighths of an inch thick, and is composed of bullet-proof glass. Two gun racks are installed in the cars fitted on the front and rear seats. Sawed-off shot guns are carried in them. The cars are maintained in patrol service 24 hours of the day.

The antenna consists of four wires stretched back and forth inside the automobile top, which is of the touring car type. Each of these four wires is nine feet long. The receiver is fastened permanently in its compartment back of the front seats and the batteries are located close to it.

S. F. AVIATRIX TALKS OVER RADIO



Miss Lillian Gatlin, San Francisco aviatrix, who has adopted radio to carry a message of aviation development. She holds several flight records.

Miss Lillian Gatlin, intrepid woman flyer, who established a record transcontinental flight during October, 1922, from San Francisco to New York in 27 hours and 11 minutes, has a new use for air waves. Not only does she fly on them but she speaks over them, too.

Last Tuesday night, as a member of the League of American Pen Women, Miss Gatlin gave a talk over station KPO.

"It is 13 years since aviation and I adopted each other," she said. "At that time it was a little toddling, winged baby. During the 13 years it and I have flown together, it has, after the manner of all children, taught me much. Also, after the manner of all children, it has increased, multiplied and replenished—that refers both to itself and to its activities."

Miss Gatlin then referred to the fact that many of her ambitions for aviation had been realized.

"It has so far fulfilled its splendid promises, but the best is yet to be," she declared.

Oscillation Trouble

If a regenerative receiver has stopped oscillating, check up on connections and on the A and B batteries. If both are all right, excessive voltage on the plate may have paralyzed the tube. To cure this keep the tube lighted for half an hour with the B battery disconnected.

MYSTERY IN BOWDOIN SIGNALS

Great interest has been taken by the radio world in the efforts of "hams" to communicate with Capt. Donald B. MacMillan, Arctic explorer, on board his "radio rigged" schooner Bowdoin. During the past year, including the complete cycle of Arctic daylight and darkness, reliable communication was maintained between the ship and amateur operators of the American Radio Relay League for nearly seven months.

Much information regarding radio conditions in this region has been gathered that will be of use in future expeditions of the kind, but some of the phenomena experienced cannot be explained with present knowledge of the effect of the aurora on radio transmission. The most surprising condition encountered was the directional shift of the "Bowdoin's" signals as the little ship went farther north. The belief that once the explorer's ship reached winter quarters its signals would be heard equally

well on either coast was not borne out.

Barrier Is Lifted

While the vessel was on its way up the coast of Greenland, Donald Mix, radio operator, was in good two-way contact with radio amateurs in the eastern part of the country, but just as soon as the most northerly destination was reached, signals, instead of being heard in New England, were picked up on the west coast. This peculiar condition continued all through last winter, except for brief periods when the barrier was lifted temporarily and short messages from Mix were picked up at widely distributed points all over North America.

From the latter part of June last year up until July 28, while the Bowdoin was working its way up north, except at certain times when the ship was under way, regular communication was maintained with New England hams. From July 28 until Aug. 27, when MacMillan was making a concerted effort to dodge the ice flows, moving southward, there was a period of complete silence. This was a cause of considerable concern until R. B. Bourne, at Chatham, Mass., who had been keeping a regular early morning vigil, picked up WNP's signals and copied a message saying that the Bowdoin had passed Etah, Greenland.

Signals Have Persisted

Although this place is within a few miles of Refuge Harbor, where the expedition spent the entire winter, this incident was practically the last time that an amateur in New England was in direct two-way contact with Mix. From that time until the early part of this year, signals from the Bowdoin have persisted in their westerly direction and Jack Barnsley of Prince Rupert, British Columbia, has been the most reliable relay operator between MacMillan and the United States. Practically all press dispatches from MacMillan and messages destined for the Bowdoin were sent by way of Barnsley's station.

All through the months of September, October, November

and December of the year 1923 communication with WNP was everything that could be asked and thousands of words of press matter were received and scores of private messages were sent in both directions. Several broadcast stations were heard by MacMillan's crew, while WNP's signals were picked in such places as Minot, N. D., Evanston, Ill., Des Moines, Ia., Hanover, N. H., Avalon, Catalina Island, Calif., Fairmont, Minn., Glenside, Pa., Jamestown, N. D., Alaska, Fort William, Ontario, and in Texas.

Beginning the latter part of January signals from Mix began to straggle and they have continued to fall off with the approach of daylight in the Arctic except for an occasional short message containing the information that "all's well." MacMillan will soon start for home and it is expected contact will be renewed again.

Aerial Condenser

A variable condenser in the antenna circuit reduces the wavelength range of the receiving set. If this is intended, such a connection is best.

S. F. Hams Find New Use For Rainpipe

Local hams are scouring the vicinity of San Francisco for rainpipes to be used as aerial masts, following the successful experiments of GBS. GBS obtained the idea from a recent issue of QST.

The latest ham to follow the rainpipe suggestion is 6CPW. He has just returned from his vacation and soon will start work on the new aerial.

6CMM, will be off the air this week. He is to vacation on the Russian River.

The vacation bug seems to have bitten all the members of the S. F. R. C. The latest mem-

HUGE STATIONS MAY CHANGE BROADCASTING

NEW YORK, July 28.—The question "Who is to pay for broadcasting?" promises soon to answer itself.

The answer may come with the erection of a dozen or so super-power stations, blanketing the country and gradually forcing the 500-odd stations out of business.

This sudden change in radio is suggested from two sources.

1. The Associated Manufacturers of Electrical Supplies, who at their Atlantic City convention recently proposed the erection of ten giant stations to replace those now broadcasting and to be paid for by two per cent of the radio receipts.

2. The American Telephone and Telegraph Co., which announces the completion of a 5000-watt apparatus for broadcasting.

Law and Protest

Against this definite trend toward limited super-power broadcasting stand two obstructions.

One is the present law which limits Class B broadcasters to between 500 and 1000 watts. Only on special permit have broadcasters been permitted to transmit on more than one kilowatt, and then only for experimental purposes. The actual perfection of larger apparatus by the biggest company in the field, however, is an almost certain sign of a change in the limitations.

The other big obstruction to super-power transmission, for the present, is an increased opposition to the scheme from various interested sources, headed by the American Radio Ass'n.

Hard to Escape

"While it is stated that such a broadcasting system would not interfere with local stations which take care of local needs," says Alfred M. Caddell, secretary of the association, "experience has shown that unless exceptionally selective receivers are used it is impossible to tune out stations using a carrier wave of high power."

"The radio business has been built largely on the thrill of getting distance, and if this thrill (and therefore other stations) is destroyed by blanketing the country steadily with high power it might lead to serious consequences in the radio world."

According to Pierre Boucheron of the Radio Corp'n of America, however, we have too many broadcasting stations. Cutting them down to ten high-power broadcasters would be not only more efficacious but more economical, he adds.

Only the more wealthy and profitable firms would be able to take up broadcasting of the super-power variety. For the cost of an installation is figured between \$40,000 and \$50,000, and its operation would be much higher than the Class B 500-watt stations of today.

bers to answer the call of the wild are 6AMS and 6CPW, who have hit the trail for Rio Nido, looking up several "ham" stations en route. 6KK has just returned from his vacation.

Lady Luck seems to have deserted 6BQL. After tinkering with and pulling out each part in his transformer he reports that he still has difficulty in getting DX.

6BBS has finished installation of his transformer in Sausalito.

The S. F. R. C. were guests of the Oakland Radio Club, Thursday. No meeting was held at the Bush-st headquarters.

THIS WEEK'S AIR PROGRAMS

Monday, July 28

KPO-Hale Bros., San Francisco (423 Meters)

12 M-Reading of Scriptures in Hebrew and English by Rabbi Herman Lissauer of Temple Emanu-El, San Francisco.

1 TO 2 P M-Rudy Selger's Fairmont Hotel Orchestra.

2:30 TO 3:30 P M-Piano solo, Quartet from "Rigoletto"; Dorothy Clark, Clara Eggers.

Double voice, baritone and soprano solos, The Little Damsel; At Dawn; Lazy; Richard Giffin; Nina Hinds, accompanist.

Tenor solos, What Will I Do?; Lazy; Richard Giffin; Nina Hinds, accompanist.

Whistling solo, Waltz Song (from "Romeo and Juliet"); T. Roy Innes.

Piano solos, To Spring; Iris; Dorothy Clark, Clara Eggers.

Double voice, baritone and soprano solos, Serenade, Twickenham Ferry; T. Roy Innes.

Tenor solos, Roses of Picardy; Shine; Richard Giffin; Nina Hinds, accompanist.

4:30 TO 5:30 P M-Rudy Selger's Fairmont Hotel Orchestra.

5:30 TO 6:30 P M-Children's Hour. Stories by Big Brother of KPO, taken from the Book of Knowledge: The Witch of the Forest Tree; How a Lighthouse Is Built; Sinbad the Sailor.

7 TO 7:30 P M-Rudy Selger's Fairmont Hotel Orchestra.

8 TO 9 P M-Organ recital by Theodore J. Irwin: March, Pomp and Circumstance (by request); Gavotte; Vorspiel, "Lohengrin" (by request); Abandonada (Mexican waltz); Traumerl (by request); waltz, "Nutcracker Suite"; symphony, Im Walde (slow movement); Arioso, "A Day in Tuscany"; light opera selection, "Iolanthe".

9 TO 10 P M-Bass-baritone solos: The Lost Chord (organ accompaniment by Theodore J. Irwin); Believe Me (old English); William Worthington, one of the directors of Peninsula Studios, San Mateo; Nina Hinds, accompanist.

Western Union radio concert: Piano solo, Medley; Helen Heinemann.

Soprano solos, Aria from "Il Trovatore"; Mary of Egypt (old Scotch); Clara Harrington; Elsa Vogel, accompanist.

Instrumental selections, A Dream of the Shepherdess; The Glow Worm; Orpheum Instrumental Trio, F. R. Wilkins, flutist; Philip Tait, violinist; H. Eastwood, pianist.

Baritone solos, Where the Lazy Daisies Grow; When Lights Are Low; B. Minner; Harold Sutcliffe, accompanist.

Vocal selections, Minnie Haha; Willie Brown; Bye and Bye; Western Union Trio, B. Doherty, G. M. Carter, B. Minner; Harold Sutcliffe, accompanist.

Soprano solos, At Dawn; When Irish Eyes Are Smiling; Dorothy Marvin; Jessie Diehl Thomson, accompanist.

Tenor solos, I'm Falling in Love with Some One; I Did Not Know; S. J. Thomas; Harold Sutcliffe, accompanist.

Soprano solo, Sweetheart; Mrs. Nell Welsh; F. W. Thrapp, accompanist.

Contralto solos, Love Sends a Little Gift of Roses; What Aloha Means; Maye Brown; Harold Sutcliffe, accompanist.

10 TO 11 P M-E. Max Bradfield's Versatile Band.

KGO-General Electric Co., Oakland (312 Meters)

1:30 P M-New York Stock Exchange and United States weather bureau reports.

4 TO 5:30 P M-Concert Orchestra of the Hotel St. Francis, San Francisco, Vinton La Ferrara conducting.

6:45 P M-Final reading, stock exchange and weather reports, and news items.

8 TO 10 P M-Instrumental selections: Selections from "Lohengrin"; Lullaby from "Jocelyn"; Vocal selections, Cixiribibin; Hall, Smiling Morn; KGO Mixed Quartet.

Soprano solos, Una voce poco fa; Melba Waltz; Claire Harsha Upshur. Duet for contralto and tenor, Still as the Night; Mary Groom Richards, Gwynfi Jones.

Hawaiian melodies, Joseph Lario, steel guitar; Jack Andrade, Spanish guitar.

Bass solos, O'er the Billowy Deep; Asleep in the Deep; Richard Lundgren.

Vocal selection, My Old Kentucky Home; KGO Mixed Quartet.

Vaudeville sketch, Boruck and Tarleton.

Piano solo, The Fountain, Joyce Holloway Barthelsson.

Duets for soprano and contralto, Tuscan Folk Songs, Claire Harsha Upshur, Mary Groom Richards.

Tenor solos, Little Lad o' Dreams; Look Down, Dear Eyes; Gwynfi Jones.

Contralto solos, My Ain Folk; My Ship; Mary Groom Richards.

Hawaiian melodies, Joseph Lario, steel guitar; Jack Andrade, Spanish guitar.

Vocal selections, La Spagnola; Soldiers' Chorus (from "Faust"); KGO Mixed Quartet.

Duet for soprano and tenor, Zuleika and Hassan; Claire Harsha Upshur, Gwynfi Jones.

Cello solo, Song of India; Margaret Avery.

Duets for tenor and Baritone, Excelsior; The Moon Has Raised Her Lamp Above; Gwynfi Jones, Richard Lundgren.

Contralto solos, My Dear Soul; A Farewell; Mary Groom Richards.

Vocal trio selection, Praise Ye (from "Attila"); Claire Upshur, soprano; Gwynfi Jones, tenor; Richard Lundgren, baritone.

Instrumental selections, To a Wild Rose; Tarantella; Arion Trio.

KLX-Oakland Tribune (509 Meters)

3 TO 5 P M-Baseball.

7 TO 7:30 P M-News, weather.

KLS-Warner Bros., Oakland (360 Meters)

11:30 TO 1 P M-Phonograph selections.

DISTANT STATIONS

KHJ-Los Angeles Times (395 Meters)

6 TO 6:30 P M-Art Hickman's Concert Orchestra from the Biltmore Hotel.

6:45 TO 7:30 P M-Children's program presenting Prof. Walter Sylvester Hertzog. The weekly visit of the Sandman and Queen Titania. Frances Bardo, 9 years old, reader. Bedtime story by Uncle John.

8 TO 10 P M-Program presented through the courtesy of the B. Spencer Wall Paper and Paint store of Anaheim, arranged by Gladys Llewellyn and the Sunkist Orchestra.

10 TO 11 P M-Art Hickman's Dance Orchestra from the Biltmore Hotel.

KGW-Oregonian, Portland (492 Meters)

8 P M-Concert by George Webber and his orchestra.

KFI-Earle C. Anthony, Inc., Los Angeles (469 Meters)

6:45 TO 8 P M-Aeolian organ recital.

8 TO 9 P M-Ambassador Hotel-Cocoanut Grove Orchestra.

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Bible Reading By Radio New Plan of KPO

Scriptures broadcast in different languages!

That is the innovation of KPO radio station in San Francisco.

Broadcasting Biblical passages in English has been carried on for the past year. Beginning today, however, the scriptures also will be sent by radio to listening fans, in foreign tongues as well.

Following in historical sequence the various translations of the Bible, scriptures will first be read in Hebrew, then in Greek and other languages of Southern, Central and Northern Europe. Then in rotation, scriptures will be read in the languages of the Orient, including Japanese, Chinese and Sanscrit.

Rabbi Herman Lissauer of Temple Beth Israel will read over station KPO at noon today. He will read the scriptures both in English and Hebrew.

'Lullaby Hour' Now Entertains Kiddies

Lullaby Hour is a new bedtime feature for kiddie radio fans being broadcast every evening over the Sears-Roebuck Agricultural Foundation's station, WLS, at Chicago. It is an hour of stories, old and new nursery rhymes, and barnyard jingles set to music to fit the themes. The Lullaby Kiddies have a regular club of their own. More than 3000 are members.

PROGRAM CONTINUED

(Concluded from Page Two)
fix; Calm as the Night; Carl Anderson and Clarence H. Oliver.
Basso-profundo solo, The Big Bass Viol; George Madison.
Instrumental selections, Rondo; melodies from "The Mikado"; Arion Trio.
Vocal selections, The Lost Chord; When the Flag Goes By; Bay City Male Quartet.
Soprano solos, Le Bonheur Est Chose Legere; Goin' Home; Thou Art So Like a Flower; Norwegian Echo Song; Ruth Collins.
Tenor solos, Blow, Blow, Thou Winter Wind; Drink to Me Only With Thine Eyes; Gwynn Jones.
Instrumental selections, La Paloma; Humoresque; Arion Trio.
10 P M TO 11 P M—Henry Halstead's Hotel St. Francis Dance Orchestra, San Francisco.

KLX—Oakland Tribune (509 Meters)
3 TO 5 P M—Baseball.
7 TO 7:30 P M—News, weather.

KLS—Warner Bros., Oakland (360 Meters)
11:30 TO 1 P M—Phonograph selections.
KRE—Berkeley Gazette (278 Meters)
8 TO 10 P M.

DISTANT STATIONS
KHJ—Los Angeles Times (395 Meters)
8 TO 10 P M—Program presented through the courtesy of the Martin Music Co., arranged by J. Howard Johnson.
Dance Orchestra from the Biltmore Hotel.
KGW—Oregonian, Portland (492 Meters)
10 P M—Police reports, baseball scores, weather forecast and music by George Olsen's Metropolitan Orchestra of the Hotel Portland (two hours).

KFI—Earle C. Anthony, Inc., Los Angeles (469 Meters)
6:45 TO 8 P M—Hennessy's Paramount Players.
8 TO 9 P M—Los Feliz Trio.
9 TO 10 P M—Examiner, Ida May Wiles' program.
10 TO 11 P M—Popular song concert.

11 TO 12 P M—Ambassador Hotel-Cocoanut Grove Orchestra.
Sunday, August 3
KPO—Hale Bros., San Francisco (423 Meters)
11 A M TO 12 M—Non-sectarian church services, Rev. A. W. Sarlander, Evangelical Lutheran Church. Sermon and prayers. Soloist, Fanny P. Ryan, soloist. Organ selections, Theodore J. Irwin.
8:30 P M—Concert, Rudy Seiger's Fairmont Hotel Orchestra.

KLX—Oakland Tribune (509 Meters)
9:30 TO 10 P M—Evening church service. Address by Rev. John Stephens of the First Methodist Church of Oakland; music by members of the church choir before and after the address.
KGO—General Electric Co., Oakland (312 Meters)
11 A M TO 12 M—Non-sectarian church services, prayers and sermon; organ selections.
3:30 TO 4:30—Waltz, "Harvise"; "Salttuch"; overture, "Ilka." Four Mexican dances; KGO Little Symphony Orchestra.
Soprano solos, "Come Unto Him"; "There Are They"; Beatrice L. Sherwood.
Piano solos, "Grillen"; "The Bird"; "A Prophet"; Mrs. Herbert Avery.
Soprano solos, "Love Me Sweet"; "Japanese Love Song"; Beatrice L. Sherwood.
Piano solos, waltz, Mazurka; Mrs. Herbert Avery.
Selection, Hansel and Gretel, "Shadows Dance."
"President's March"; Old Song Series, No. 12, "Long, Long Ago"; Paraphrase, Voigt.
7:30 P M—Non-sectarian church services, prayers and sermon.

HIS MASTER'S VICE



Feature for Blind

One of the features in a new magazine for the blind, printed in raised braille, is given over to radio. The magazine is published by the Minnesota Council of Agencies for the Blind.

'Ham' at Curry Gets DX Stations

CAMP CURRY, Yosemite, July 28.—Some excellent receiving records have been made during the past few weeks by Kenneth Hughes, amateur radio experimenter at Camp Curry. Hughes' portable set operates under great difficulty due to cliffs 3000 to 5000 feet high on all sides of the Yosemite Valley. As a result of his observations, he believes that it is possible to hear other waves from great distances despite natural barriers. He has reported amateur stations in all nine radio districts.

International Aerial

H. G. Dickinson, superintendent of the Niagara Falls lower steel arch bridge, has an antenna that crosses the border from the United States to Canada. It's about 1000 feet long, stretching over the lower rapids.

Battery Conference

Dry battery manufacturers are planning to meet with government radio men in a conference to adopt certain standards for their products. The best kinds of batteries for radio use are planned.

British amateurs recently heard an Argentine station.

S. F. Amateurs Hear Test Signals

HARTFORD, Conn., July 28.—Having communicated in both directions with amateur radio telegraph operators in South America, amateurs of the United States and Canada are now turning their attention to the Pacific Ocean for the purpose of engaging in a two-way radio contest with the experimenters in Australia and New Zealand. Two ten-day periods, one in August and the other in September, have been set aside.

This test is being arranged by the American Radio Relay League, in a determined effort to establish two-way radio contact with North American operators before the end of the year. All of the transmission will be carried on with very short waves.

Announcement was made at the A. R. R. L. headquarters today that the first transmitting period will be from Aug. 10 to 21, and the second from Sept. 7 to 17. Australian and New Zealand amateurs will listen from 3 to 3:30 a m, and they will transmit from 3:30 to 4 a m. Two-way work will be attempted daily starting at 4 a m.

While the amateurs in the United States and Canada will be losing sleep in the early morning hours, Australian and New Zealand operators will be working their stations about 6 p m. The transmitting hours will be the same each day.

Radio World Fair Lures Exhibitors

NEW YORK, July 28.—Inventors are getting ready to send heretofore unheard of ideas and apparatus for exhibition at the first radio world's fair, which will be held here Sept. 22 to 28.

The promise of new inventions is so great that Managers U. J. Herrmann and James F. Kerr have been compelled to enlarge the "New Inventions Section" for the exhibition of 100 devices.

Among the noteworthy American discoveries to be shown will be at least three different methods for transmitting photographs by radio. Europe also will be well represented here.

The first program of radio motion pictures may come from this fair. Herrmann and Kerr hope to be able to broadcast the first radio movie show on the opening night of the exposition.

Opera by Telephone

Munich (Bavaria) telephone subscribers may now listen to their famous opera company by paying an additional fee. The music does not interfere with any conversation along the same line.

Clean variable condensers often with pipe cleaner.

Rosy Future In Radio For Boys, Claim

"Radio offers a great future to the American boy," declared E. W. Lovejoy, United States radio inspector, in an address to members of the Alameda Amateur Radio Club in Melrose recently.

That same urge which led our forefathers to explore the unknown seas, and to pioneer in new lands, still lingers in the heart of mankind," Lovejoy said. "There are no more uncharted seas to explore. Every piece of the earth is known, labeled and inhabited, but the modern young blood in search of adventure often finds it as ship radio operator of vessels which ply between foreign ports."

According to Lovejoy, there is always a demand for good ship radio operators. These positions are filled by large wireless companies which contract with steamship companies to supply men and radio apparatus.

"To qualify as ship radio operator," Lovejoy stated, "the applicant must hold a first-class radio operator's license. He must be able to send and receive code at a speed of at least 20 words per minute. He also must be acquainted with the theory of radio, and have a practical knowledge of its operation."

"Adventure also beckons in other branches of the radio industry," Lovejoy continued. "With the great number of experiments being carried on, its rapid development, and ever-growing popularity, radio offers unlimited opportunities to young men."

U. S. farmers have invested about \$20,000,000 in radio, reports the department of agriculture.

RADIO NOW FOR TANKS

NEA Service

WASHINGTON, July 28. Army tanks will be equipped with radio sending and receiving sets, according to word from the United States war department.

This has been decided on after successful tests made with equipment suitable for rough usage such as tanks undergo.

The only difficulty with these is that the noise while the tanks are in motion is so great that the sets cannot be used. Even while the tanks are not moving, for proper transmission the sets have to be well shielded from metal bodies.

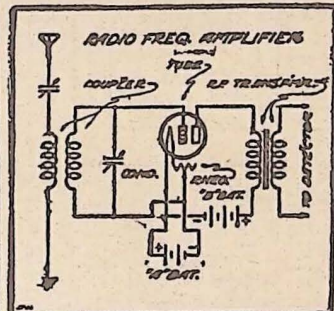
RADIO FROM THE GROUND UP

We have studied the vacuum tube as a detector of radio frequency currents, and we now come to its other use in radio reception—as an amplifier. Here its action even more closely resembles that of the valve controlling the water supply than it does in the case of the detector. As an amplifier a small change of voltage applied to the grid of the tube causes a very much greater change in the current of the "B" battery. Of itself the tube is capable of amplifying energy between five and eight times.

The tube is employed as an amplifier in two outstanding ways—as an amplifier of radio frequency impulses and as an amplifier of audio frequency impulses. The radio frequency amplifier amplifies the incoming energy which is picked up by the aerial and strengthens it before it reaches the tube or crystal detector. On the other hand, the audio frequency amplifier is designed to magnify the intelligible speech and music already heard on the detector so as to make it louder. The effect of the radio frequency amplifier is to bring the sending station nearer to the receiving station. The audio frequency amplifier, however, has the effect of moving

the telephone or loud speaker closer to your ears, so that the sounds are louder.

It is possible to make up a receiving set using both radio and audio frequency amplifiers.



tion, and in that case the effect would be that of moving the sending station nearer to you and at the same time bringing the loud speaker nearer your ears. Therefore, the radio frequency amplifier is employed to receive over longer distances, while the audio amplifier is used to increase the volume or loudness of the music or speech already audible.

Both Kinds

In an accompanying sketch there is shown in outline the arrangements for a single stage of radio frequency amplification. The primary and secondary cir-

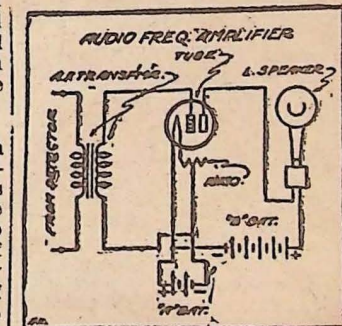
cuits are tuned in the customary and familiar manner, but the alternating voltage is impressed directly upon the grid and the negative terminal of the filament. The plate circuit of the tube is connected to the "B" battery through a coil of wire which is the primary of another coupler. This is termed the "radio frequency transformer," and it is so constructed that it is not necessary to tune it carefully by a variable condenser, as was done in the case of the coupler or transformer by which the energy from the aerial is transferred to the grid circuit of the tube. This is accomplished by winding the primary and secondary coils on a core of iron sheets and by using very fine wire for both.

Voltage Amplification

The audio amplifier is much the same, although the transformer is wound with thousands of turns of wire instead of the few that are needed for radio frequency. This is because of the much lower frequency (much longer wave length) of audible impulses and the audio transformer must transfer energy on frequencies between about 100 and 3,000 cycles. The radio frequency transformer on the other hand amplifies on frequencies between about 1,500,000 and 6,000,000 cycles for

broadcast work.

In the case of the audio amplifier there is an increase of voltage due to the difference in the number of turns on the primary and secondary coils at the transformer. Often the "step-up" will be in the vicinity of five so that this must be multiplied by the amplification factor of the tube in order to find the total amplification of the amplifier. The amplifier would thus increase the volume about forty times, more or less. The radio frequency amplifier does not nearly approach this high figure be-



cause of the poorer efficiency of amplification on higher frequencies, and a figure of about six for a stage of radio frequency amplification may be considered good.

RADIO PHOTOS NOW REALITY

TRANSMISSION OF PICTURES NOW POSSIBLE

NEA Service

WASHINGTON, July 28.—Transmission of pictures by radio, long the subject of world-wide discussion and experiment, is at last ready for practical use.

Initial installations are now being made and soon the whole United States, as well as other countries, is expected to be covered with a network of radio photo transmitting and receiving apparatus.

A company has already been formed here for the purpose. It establishes and operates transmitting equipment, manufactures and leases receiving apparatus, and is continuing research work for perfection of the machinery. Basic patents have already been issued and others have been applied for.

Behind this tremendous advance in the history of wireless is C. Francis Jenkins, the inventor, who is as famous in the motion picture field as he is in the radio field. He has the distinction of being accredited the inventor of the first motion picture projector.

The Apparatus

For the last few years it has been known that Jenkins had been working on a method of sending pictures by radio. Others, too, have been busy with the same idea, but Jenkins' machine is unique.

The basic of the apparatus is a prismatic ring, or disc, a new optical shape in glass, which Jenkins himself designed and can make only by the use of special apparatus. In the sending apparatus four prismatic rings are combined, revolving across a light beam directed through a photo negative. These rings slice the rays into strips and convert the light values into electrical values.

The electrical values are then sent out into space on radio carrier waves, just as sound is transmitted. At the receiving end these electrical waves are caught, converted into light and recorded on a photo negative.

Thus one broadcasting station

KGO PRESENTS "GREAT DIVIDE"



KGO players in a scene from the drama, "The Great Divide," to be given in the studio of the General Electric station on Thursday evening, July 31. From left to right: Bert Horton and Pearl King Tanner.

can transmit a photograph to as many points as have the required receiving apparatus, powerful enough to detect the wave of the broadcaster. In this, the photo broadcasting is similar to sound broadcasting, the distance of transmission being dependent on the power of the station and the strength of the receiving set.

Radio Vision Ahead

Jenkins expects to go even further. He forecasts the coming of radio vision and radio movies within a few years. In his laboratory here five youths are helping him perfect these wonders. Combined with audio-radio, Jenkins sees the next generation listening and seeing plays and events enacted far away.

For the present the Jenkins installation for broadcasting pictures by radio includes the transmission of messages, contracts and newspaper copy by this method. Jenkins has been able to flash 100 words a minute in this way. He predicts 1000 words a minute within a short time.

Airmail Radio

The airmail service has been assigned the use of wavelengths between 3000 and 4000 meters. All stations are called on the general 3998-meter wavelength.

Correct Time Now Given By Radio

Elgins, Walthams, Ingersolls and other timepieces may play tricks with Father Time. But radio fans who tune in on KPO's n on signals can regulate their watches to the fraction of a second.

Five minutes of 12 the time signals from the Mare Island naval yard are sent to Hale Bros., and by them broadcast throughout the west. All Western Union clocks from Ogden, Utah, west, get their time from these signals.

The three great clocks at Mare Island are regulated by the stars. The time is accurate within a two-hundredth part of a second. At five minutes to 12 every second is broadcast to the Western Union stations.

Theater on Air

The Mark Strand Theater in New York, one of the largest movie theaters in the country, will broadcast its music and special concert programs every Sunday night from station WMAF at South Dartmouth. A special telephone line carries the concert from the theater several hundred miles to the station.

Neutrodyne Wins Broadcast Test

In announcing the results of its annual distance competition, Radio Broadcast shows that the Neutrodyne receiver won in the constructors sets used for this purpose. The winners using this type of receiver covered an aggregate of 371,813 miles, each of the three Neutrodyne winners covering a greater distance than any of the other sets winning prizes in the competition.

LET'S SWAP

These "Swap" advertisements will be published free of cost until further notice in the Monday Radio Magazine of The Daily News. The article to be traded must be radio equipment. Keep the wording concise.

TO SWAP—Brand new tubes, UV199 or C299 or C300; will swap one for audio-freq. transformer or new 45-volt battery; or will sell each for \$3.50. Call at 2711 Bryant-st between 7:30 and 9 p.m.

TO SWAP—25-volt rechargeable "B" battery and 4-volt rechargeable "A" battery, for a loud speaker. J. F. 2369 Howard-st. Phone Mission 5956.

TO SWAP—Good crystal set for vacuum tube and socket or a good "B" battery or "A" condenser. Francis Kirby, 244 Allison-av. San Francisco.

TO SWAP—Loose coupler crystal set, complete except for headphones; will exchange for a variable condenser or something of equal value. E. N. Hacker, 3047 Logan-st, Oakland.

TO SWAP—Ten-watt transmitter, complete, \$50; 6-volt, 140-amp. "A" battery, new; \$15 honeycomb coils and parts. Martyn, 475 30th-st, San Francisco. Phone Val. 1717.

TO SWAP—Half kilowatt spark set, complete for parts for low power tube set. Or what have you? White (6CPS), 470 Page-st. Phone Park 5403.

TO SWAP—Lemco tuner set (range 1000 miles), without phones, tubes or batteries, for good complete crystal set. Write George Pauloula, 3345 21st-st, San Francisco.

TO SWAP—One-stage audio frequency amplifier in cabinet, for other radio equipment. R. W. Kiepert, 320 Frederick-st.

TO SWAP—Two Cymo variometers, 1 Remier variometer, 2 variocouplers, 1 Regal inductance switch for radio parts or cash. E. Schoenfeld, 472 Clementina-st. Kearny 4086.

TO SWAP—One audio frequency amplifier on panel, with "C" batteries, using Kellogg transformer, for two slightly used C-299 tubes. Phone Valencia 954.

'HAMS' PLAN AUSTRALIAN RADIO TEST

HARTFORD, Conn., July 28.—Signals from 66 amateur radio telegraph stations in the United States and Canada were heard by three amateur operators in South America during the recent Pan-American short wave tests, according to letters which have straggled into the American Radio Relay League headquarters.

With the single exception of the seventh, all radio districts in the United States were represented in the list of calls reported by listeners in either Argentina or Brazil. Out of the grand total given above, two of the stations heard are in Canada. The South American listeners are Carlos Braggio of Bernal, Argentina; R. Y. Jones of Sao Paulo, Brazil, and Ignacio M. Gomez of Buenos Aires.

When the calls are divided according to districts the first takes the lead with 17 calls; the eighth, 13; the third, 11; the fourth, 7; the ninth, 7; the sixth, 4; the second, 3, and the fifth, 2. Both of the successful Canadian stations are in the first district.

Oakland Broadcasts Curry Program

CAMP CURRY, Yosemite, July 28.—Camp Curry's evening campfire entertainment was broadcast from station KGO of the General Electric Company at Oakland at 8 p.m. Saturday, July 26. Many hundreds of radio fans who have visited the famous Yosemite resort tuned in for this special event.

The entire group of Camp Curry's regular entertainers journeyed from Yosemite to San Francisco for the occasion.

World Language

Stations WLW, Cincinnati; CKAC, Montreal, and CKY, Winnipeg, are planning the broadcasting of lessons in Ilo or Esperanto, two "international languages" urged for universal use. Ilo is the more popular among radio men.

AMPLIFIER IS EASY TO ADD TO SET

BY DAVID DIETZ

A one-tube radio set necessitates the use of headphones. Where it is desired to operate a loud-speaker, more than one tube must be used.

The addition of one stage of audio-frequency amplification will add about \$12 to the cost of a radio set. The addition of two stages will add about \$24.

It is no harder to add two stages of amplification than it is one. Consequently, except in cases where the amateur feels that the additional cost is too great, it is better to add two stages than one.

One stage will give plenty of volume on the loud-speaker on local stations. It will be found a bit weak, however, for out-of-town stations.

However, it is possible to add one stage of amplification to a set and then add the second stage at a later date.

If the amateur is thinking of doing this, he should make the panel of his set long enough to allow room for the second stage.

The accompanying hook-ups show how to add one stage of amplification to the three most popular circuits previously described.

Figure 1 shows the modified Codd circuit with one stage of amplification. This is the non-radiating form of the circuit.

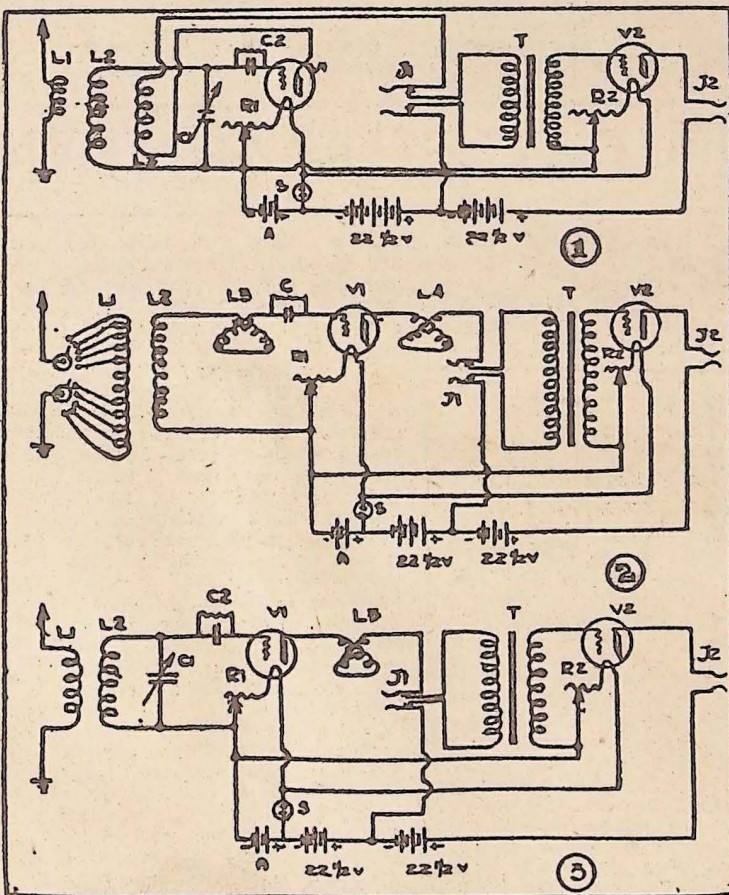


Figure 2 shows the Armstrong three-circuit regenerative set with one stage of amplification.

Figure 3 shows a modified form of the Armstrong circuit employing a fixed coupler. It

also includes one stage of amplification.

Figure 1 shows the modified Codd circuit equipped with an aperiodic aerial coil to prevent radiation.

This is made by winding six

turns of annunciator wire in the form of a helix over the primary of the variocoupler. This winding should be in the same direction as the primary of the coupler.

It is unnecessary to use the taps on the coupler primary. If the amateur desires, one tap at the center of the winding can be used. This makes tuning a little sharper.

Apparatus is labeled as follows in Figure 1:

L1, aperiodic aerial coil.
L2, coupler primary.
L3, coupler secondary.
C1, 23-plate variable condenser.

C2, grid leak and condenser.
V1 and V2, vacuum tubes.
R1 and R2, rheostats.
T, audio-frequency amplifying transformer.

S, battery switch.
J1, double circuit jack.
J2, single circuit jack.

Armstrong Set

Figure 2 shows the Armstrong three-circuit regenerative set. This set employs a variocoupler and two variometers. The variocoupler should be the type equipped with two sets of taps. Two rotary switches must be used then to control the primary.

This is a circuit which is known to all experienced amateurs as one which tunes sharply and brings in distant stations.

Apparatus labeled as follows in Figure 2:

L1, coupler primary.
L2, coupler secondary.
L3 and L4, variometers.
C, grid leak and condenser.
V1 and V2, vacuum tubes.
R1 and R2, rheostats.
T, audio-frequency amplifying

transformer.

S, battery switch.
J1, double circuit jack.
J2, single circuit jack.

Fixed Coupler

Figure 3 shows the modified form of the Armstrong circuit employing the fixed coupler.

There are a number of fixed couplers on the market. One can be made at home, however, if the amateur wishes to.

It should be wound on a four-inch cardboard tube. The primary, consisting of six turns of No. 22 wire, is wound at the center. The secondary is wound in two sections, one on each side of the primary. Each section consists of 20 turns of No. 22 wire. All three windings should be in the same direction.

This set will appeal to many amateurs because it has only a minimum of tuning controls.

Apparatus is labeled as follows in Figure 3:

L1, fixed coupler, primary.
L2, fixed coupler secondary.
L3, variometer.
C1, 23-plate variable condenser.

C2, grid leak and condenser.
V1 and V2, vacuum tubes.
R1 and R2, rheostats.
T, audio-frequency amplifying transformer.

S, battery switch.
J1, double circuit jack.
J2, single circuit jack.

For Sale or Exchange

One complete set of honeycomb coils with aperiodic mounting for panel.

LOUIS NOUGUIER

378 2nd Ave., S. F.

Res. 916—6:30-9:30 P. M.