

New Eight Tube Super-Heterodyne Panel Layouts; How Detectors Operate; Trouble Finding on Kennedy Model XV Receiver; Week's Advance Programs

Radio Digest

EVERY WEEK

PROGRAMS Illustrated

TEN CENTS

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No. 3

RESTRICT GIANT STATIONS

WMAQ STARTS NEW RADIO-PHOTOLOGUES

LECTURES GIVEN BY NOTED TRAVELOGUE TALKERS

Print Pictures in Paper on Day of Lecture for Listeners in to Follow

CHICAGO.—Here is something new. Every Saturday night, from 8:40 to 9:00, the Daily News Station, WMAQ, broadcasts a Radio-Photologue with the aid of some noted lecturer and traveler. In the picture section of the paper every Saturday, pictures of the trip or the country to be visited in the lecture are printed. In the evening, when the lecture starts, all the listener has to do is take this page, clamp on the head set or turn on the loud speaker and follow the talk with the aid of the photographs. The station has booked Radio-Photologues and speakers of wide repute far into the coming spring. Among those who will lecture in the near future are the following: Clara E. Laughlin, who will lecture on Italy; Professor Isaac J. Cox, on the Argentine Republic and Chile; Charles A. Kent, the Buried Races of Mexico.



HOOVER MEET RECOMMENDS BARS BE KEPT

Solves Many Problems

Suggests Trial Super Station—Creates New Wave Bands—Asks Non-Censorship of Air

WASHINGTON.—The Third Radio conference is now a matter of history. Into the record the following has been written: the big points of its accomplishments.

1. It opposed the withdrawal of limitations on high power stations.
2. It created new wave band channels to include from 200 to 545 meters.
3. It recommended that the depart-



Left to right: Anna Cockburn, one of the most frequently requested artists at WSAI and one of Cincinnati's foremost piano soloists. Florence Johns of "Best People," now playing in New York. Miss Johns frequently plays before the microphone at WEBJ. Anna Finto is one of America's most youthful harp virtuosos. Her concert recitals have been featured at WJZ for over three years. She played a special recital there on September 21.

ment of commerce leave its hands off programs as it does at present. This to avoid censorship.

4. It abolished the 300 meter wave length from sea use because of its interference with broadcasting. The 600 meter length will be used only for distress signals.

5. It recommended that interconnection be encouraged as the most important development of the past eighteen months.

6. It recommended that station classifications be changed from class A and B to class 1 and 2, etc.

7. It recommended that class C stations not be abolished but new wave lengths assigned them.

(Continued on page 2)

COMPLETE REPORT OF THIRD RADIO CONFERENCE

(Continued from page 1)

8. It is recommended that all high power experimental stations be placed under strict supervision.

9. It stated that between the hours of 7 and 11 in the evening no ship reports should be sent.

10. It asked that Congress appropriate more money for the use of the department in inspection work.

The results of the conference's work remains to be seen.

The conference was attended by more than three hundred delegates and was declared to be the most representative gathering of all branches of Radio which has ever been held.

Divide Sessions

President Coolidge, Secretary Hoover, and many of the leading men in all branches of the Radio industry addressed the conference. For the purpose of expedition, Secretary Hoover arranged at the beginning of the conference to hold general sessions once a day. The remainder of the time, the conference was divided up into eight sections, each dealing with a special subject. It was deemed that this would make it much easier to reach committee agreements so that recommendations could be arranged and made to the general conference. At the first two Radio conferences all worked for the good of Radio it is expected that the third conference, when its work has been thoroughly digested, will also have accomplished considerable good.

"The day is not far, when technical developments in the broadcasting art will enable our country, through super-power stations, to reflect its culture and to speak its best thought to other nations of the world. At that time the United States will take the same position of leadership in world wide broadcasting that it occupies today in world wide Radio telegraphic communication," said David Sarnoff, vice president of the Radio Corporation of America, addressing the conference.

Recommends Linking of Stations

He said, that the fundamental elements in the broadcasting situation from the standpoint of the art are: 1. Stations of comparatively limited range connected by wire. 2. Stations linked and rebroadcast by short wave transmission. 3. Super power development for a service direct to large areas of population.

C. P. Edwards, chief of the Canadian Radio Service told the conference that this country is vitally interested in Radio conditions in the United States because of its proximity and the fact that the wave lengths assigned in Canada have to conform with those assigned to this country. W. P. Terrell, chief of the Radio section of the department of commerce said that he faces two big problems. One is the electrical device interference, including high power transmission, electric signs, trolley cars, etc., and second the wave length situation.

Press Vitally Interested

Joseph Nolan of the Oakland (Calif.) Tribune, said that the Radio problem is now vital with the newspapers of the United States. He pointed out to the conference the tremendous responsibility which devolves on every man who has charge of a broadcasting station. Present Radiocasting will have a direct bearing on the citizenship of the future, he said.

"There is increasing progress in knowledge of the factors entering the Radio interference and methods of elimination various types of interference," said George K. Burgess, director of the bureau of standards. Mr. Burgess stated that the preliminary results of a statistical study of interference to broadcast reception conducted by the bureau of standards with the co-operation of about 200 observers in the past two years, located from 1 to 400 miles from two selected broadcasting stations show that the principal obstacles to broadcast reception are, in the following order: "other broadcast stations, atmospheric, radiating receiving sets, amateurs, commercial stations and non-Radio electrical interference."

Appoint Committees

At the opening of the regular business session of the conference Secretary Hoover announced the appointment of 8 sub-committees, each with a chairman and secretary. The purpose of this arrangement was to allow the conference to proceed more smoothly and expeditiously. The committees with their chairmen follow:

Subcommittee No. 1, General Allocation of Frequency for Wave Length Bands, W. D. Terrell, chairman; subcommittee No. 2, Allocation for Frequencies for wave lengths to Broadcasting Stations, Dr. George K. Burgess, chairman; subcommittee No. 3, General Problem of Radio Broadcasting, Gen. Geo. O. Squier, chairman; subcommittee No. 4, Problems of Marine Communication, Hon. Wallace H. White, Jr., chairman; subcommittee No. 5, Amateur Problems, H. P. Maxim, chairman; subcommittee No. 6, Interference Problems (not covered by other committees), Maj. L. E. Bender, chairman; subcommittee No. 7, Interconnection, Judge E. Davis, chairman; subcommittee No.

8, Co-ordinating committee. This committee was formed by three members chosen from each of the above seven committees—twenty-one members in all.

Newspaper Men Meet

Walter A. Strong, chairman of the Radio committee of the American Newspaper Publishers Association, called a meeting of the newspaper publishers operating Radio stations during the conference. Its recommendations adopted were submitted to the conference.

They pledged co-operation in broadcasting events of national importance, expressed the belief that listeners are "opposed to any form of direct advertising by Radio. They pledged the publisher-broadcasters to a program of education "to instruct the listeners-in to avoid unnecessary interference caused by certain receiving sets."

"No Monopoly" Says Coolidge

"The administration, through Secretary Hoover, has from the beginning insisted that no Radio monopoly should be allowed to arise" said President Coolidge, addressing the assembled conference at the White House. "And" he continued, "to prevent it the control of channels through the ether should remain as much in the hands of the government, and therefore of the people, as the control of navigation upon our waters. While we retain the fundamental rights in the hands of the people to the control of these channels we should maintain the widest degree of freedom in their use."

The President pointed out the responsibility which rests upon broadcasters for clean programs, and continued, "In many other countries the governments in order to assure these guarantees, have taken over the actual conduct of the program by Radio. We have not believed that this was consistent with American institutions, but we believe that freedom and development in these matters would secure wider use in the art and more perfection in its conduct. We have been prepared to trust our people to preserve the high standards and ideals which must accompany this great agency of communication.

"I wish to thank you," continued the

President, "for the co-operation you have given to the administration and to express the appreciation which I feel is due to you gentlemen who have contributed so much to the development of this new advance in our civilization. It is a fresh evidence that the genius for progress has not left the American people, and that our citizens can be relied upon to conduct their own business in a way best calculated to promote public welfare."

Received Thousands of Telegrams

During the course of the conference literally thousands of telegrams were received at the department of commerce many of which expressed the hope that no monopoly would be permitted.

"There is just one cardinal principle in the direction of the department of commerce in the relations of the government to Radio," said the secretary in referring directly to these telegrams. He continued:

"We intend to encourage wherever it lies in our power the development of this art in every direction to its maximum of service to the American people. It cannot so develop if there is any monopoly. With 530 broadcasting stations operating today and with four or five alternative methods of interconnections in prospect, or in service, there is no monopoly today nor would it be allowed."

Favor Interconnection

High power transmission and interconnection was favored by Powell Crosley, Jr., of the Crosley Radio company, in a talk before the conference. Mr. Crosley said that there is a very great misconception on the part of listeners in regarding interconnection and particularly among the owners of small sets. Many believe that high powered stations would interfere with their reception.

He spoke particularly of the benefit which the farmers of the country would derive from interconnection and high power stations. He also referred to the fact that while static is the worst form of interference, electrical contrivances in the home as well as out of it cannot be abolished but they will yield in a large measure to super power. The spark of (Continued on page 4)

CONTENTS

Radio Digest, Illustrated, Volume XI, Number 3, published Chicago, Illinois, October 25, 1924. Published weekly by Radio Digest Publishing Company, 510 N. Dearborn Street, Chicago, Illinois. Subscription rates, yearly, Five Dollars; Foreign Postage One Dollar additional; single copies Ten Cents. Entered as second-class matter at the postoffice at Chicago, Illinois, under the Act of March 3, 1879.

All the Live News of Radio.....	1 to 8
Secrets of Selectivity and Regeneration, Part II—Selectivity in Series of Tuned Circuits, by William W. Harper.....	9
Advance Programs for the Week at the Larger Stations.....	11 to 14
Eight Tube Super-Heterodyne Receiver, Chapter III—Panels and Shielding, by Harry J. Marx.....	15
Editorial Indi-Gest; Condensed by Dielectric.....	16
Operating and Trouble Shooting for Owners of Kennedy Model XV Receiver.....	17
Helpful Hints to Get the Most from Radio, Chapter VI—Crystal and Tube Detectors, by Thomas W. Benson.....	19
New Regenerative Circuit, by E. N. Baldwin.....	21
Questions and Answers.....	22
Radiophone Broadcasting Stations—Part II.....	23

Looking Ahead

Operating and Remedying Troubles in the operation of the Freed-Eisemann neotrodynamic set will be an interesting topic for the many users of this popular receiver. Read this article of the "Operating and Trouble Shooting" series next week. Then, too, in another article, Charles Manley will discuss neotrodynamic in general, and tell how to get the best possible results from them.

Two Pages Behind the Scenes at KYW await the readers. One of the first on the air, this popular Westinghouse station has remained very popular as the Radio audience has grown into the millions in number.

How to Put the Finishing Touches on the Eight Tube Super-Heterodyne will be told by H. J. Marx in the concluding article of this series next issue. Mr. Marx will give simple explanation of the tuning intricacies of this popular set.

Resistance Is Detrimental to Selectivity. How? Read what William W. Harper has to say next issue on this subject. His extraordinary analysis of the selective set problem is worth more than ordinary attention.

A Radio Table with Enclosed Battery Compartment is the practical piece of furniture to be described next week by Charles F. Smisor in his series, "Console and Cabinet Making for Receiving Sets."

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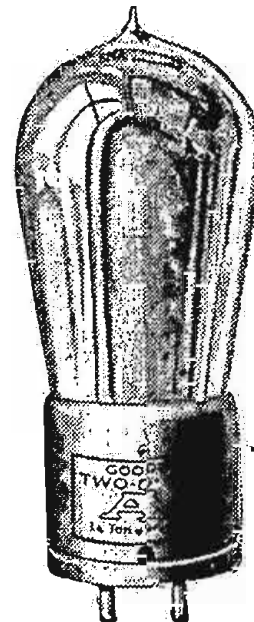
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Lincoln Low-Loss Grounded Rotor Condenser, 23-plate model is most efficient electrically, strongest mechanically. Several radical improvements. List price \$4.50.

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The "superhet" depends for efficiency on its oscillating circuit. The Lincoln Oscilloscope permits such delicate control of oscillations that it produces amazing results. List price \$6.50.

Lincoln Collapsible Loops

Correctly designed mechanically and electrically. Insures quality reception... and is most convenient. List price \$6.50. The Lincoln Collapsible Four-Point Tapped Loop is ideal for "superhet" and other radio-frequency circuits. List price \$8.00.

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Includes the "Long 45" Tuner. Everything for a 1-tube set with coast-to-coast range. Easy to assemble, easy to add to. List price \$21.50.

Write for Catalog

All Lincoln products fully guaranteed. If your dealer cannot supply you, order direct giving his name. Write for illustrated catalog giving full descriptions.



Lincoln Radio Corporation

224 N. Wells St. Chicago, Ill.

CROSLY DEDICATES NEW WLW STUDIOS

SIGNS DIRECT PERFORMER BEFORE MICROPHONES

Overcome All Voice and Instrument
Reverberation by Use of Specially
Acoustically Treated Studios

CINCINNATI.—Dedication of the new WLW broadcasting studios of the Crosley Radio corporation took place at eight o'clock Monday evening, October 13, with a special program of favorite artists and personages. With few exceptions, it was supplied by those familiar to the station's audience.

Several new features are found in apparatus design that will make this station one of the foremost in the broadcasting field. One of the most important contributions to the Radio art is found in the combination microphone stand and signal system, developed in the engineering laboratory of the station.

Signs Direct Performer

By means of this stand, it is possible for the musician or speaker to know when to broadcast without the studio director personally informing him. Small signs are placed on the top of a pedestal, arranged so as to be seen from any position in the studio. One is "Prepare" and the other, "Broadcast." These signs are automatically controlled by the studio director.

This device tends to do away with the little delays which occur in broadcasting studios where the microphones have to be adjusted for the individual work and where only one studio is used. It is unnecessary to move the microphone from one position to another to take care of a single artist or an ensemble.

Use Two Studios

Exceptionally large ensembles can be accommodated in the large studio which is 27 feet by 28 feet. In the solo studio, which is 14 feet by 28 feet, ample room is found for a small orchestra and the studio director's office. An auditorium, 41 feet by 21 feet, is provided for visitors, who are able to see the artists through the plate glass partitions of the two studios and hear just what the Radio audience does by means of a loud speaker.

Groups of four colorful chairs are placed throughout the auditorium. Tapestries adorn the end walls, while a large mirror hangs above the heavy, handsome Italian chests. Large over-stuffed davenport are at each end of the room while overhead lighting gives the necessary artistic touch.

Ventilate with Noiseless Fans

Monks cloth covers the walls of the two studios, its special mission being to take care of the perfect reproduction of the music and voice without reverberation. The ceilings are especially treated acoustically as an adjunct to the walls. Noiseless ventilators keep the studios and auditoriums at even temperature.

A triangular shaped room, located between the two studios, is equipped with an amplifier and switches in the telephone circuit for use in remote control. The operator and studio director can see and control the microphones from this room.

TENNESSEE STATION TO JOIN CLASS B SOON

Announce Power Increase for WOAN at Lawrenceburg

LAWRENCEBURG, Tenn.—The South is to have another large broadcaster on the air soon when WOAN makes its debut as a 500-watt, class B station. The massive steel towers have been constructed and when the 500-watt transmitter is installed probably about November 15, the station will be ready for use. This station belongs to James D. Vaughan, music publisher, and has been operating on 200 watts for some time.

"OLD BILL"—VOICE OF HASTINGS



W. G. "Bill" Hay, announcer at Station KFKX, who landed in third place in the recent first annual Radio Digest Gold Cup Award. Mr. Hay is admired by thousands of Radiophans throughout this country, and next to his family and work, he likes his pipe the best.

BRITISH TO RELAY U. S. RADIOCASTS

Difficulties Still Remain for America to Overcome in Perfecting Rebroadcasting System

LONDON.—In an interview to the press recently, Capt. A. D. G. West, assistant chief engineer of the British Broadcasting company, was optimistic regarding the relaying of American broadcasting in England this winter.

Capt. West is confident that the greatest difficulties have been overcome and that reception of America will be con-

siderably easier this year than last. He has made good use of the experience gained last winter in modifying his receiving apparatus and is convinced that it is as nearly perfect as any such apparatus yet produced.

"I am of the opinion that, at the point we have reached, it only remains for America to overcome the difficulties on that side," said Capt. West, "and we of the B. B. C. shall be able to provide concerts for English listeners in."

Radio Operates Fog Signal

WASHINGTON, D. C.—The Newfoundland government has just established an automatic Radio fog signal beacon at Cape Bauld, which is the northernmost cape of that island.

WNAC HOLDS FIRST CARILLION CONCERT

LEFEVERE, NOTED ARTIST, COMES FROM MALINES

Concert Said to Be First Ever Broad-
cast Here and Second in Radio-
casting History

BOSTON.—For the first time in the musical history of the United States a carillon concert was broadcast from Station WNAC on October 15.

This rare and highly melodious instrument consists of a set of 23 or more perfectly tuned bells, arranged on a chromatic scale in the manner of a piano. It is located at St. Stephen's church in Cohasset, Mass., and is the gift of Mrs. Hugh Bancroft as a memorial to her mother. It was dedicated a short while ago.

For the occasion of this concert Monsieur Kamiel Lefevere, one of Belgium's most famous carillioneurs, came to this country from his home in Malines, where he is assistant carillonneur at St. Rombold's cathedral.

It is in Belgium that most of the carillions are today. Most of them date back of the seventeenth century. Their history is exceedingly interesting.

Date Before 1600

In the beginning of the sixteen hundreds there were several famous bell founders who mastered the art of casting musical bells and tuning them perfectly. It was during this time that most of the carillions of Holland, Northern France and Belgium were made.

They differ from the ordinary set of chimes in that all chime music is confined to the very simplest airs and only in the key of C. On the carillon any musical composition that can be played on any instrument can be used, and in any desired key.

The carillonneur plays on a keyboard which in a general way resembles the keyboard of an organ with short levers in place of keys. These levers are attached by wires to the clappers of the bells.

First Carillon Concert Here

The secret of art used in the casting and turning of the bells was lost over 250 years ago. It was only three years ago that it was rediscovered in England and carillon manufacture was resumed.

The carillonneur is trained at the school in Malines. It is the only one in existence and under the direction of Jeff Denyn, known as the greatest carillonneur of all time.

The only other time a carillon concert has ever before been broadcast was at the recent Wembley exposition in England M. Lefevere was the artist then.

Applause mail proved at Station WNAC that the concert was regarded as one of the most unusual and remarkable ever given here.

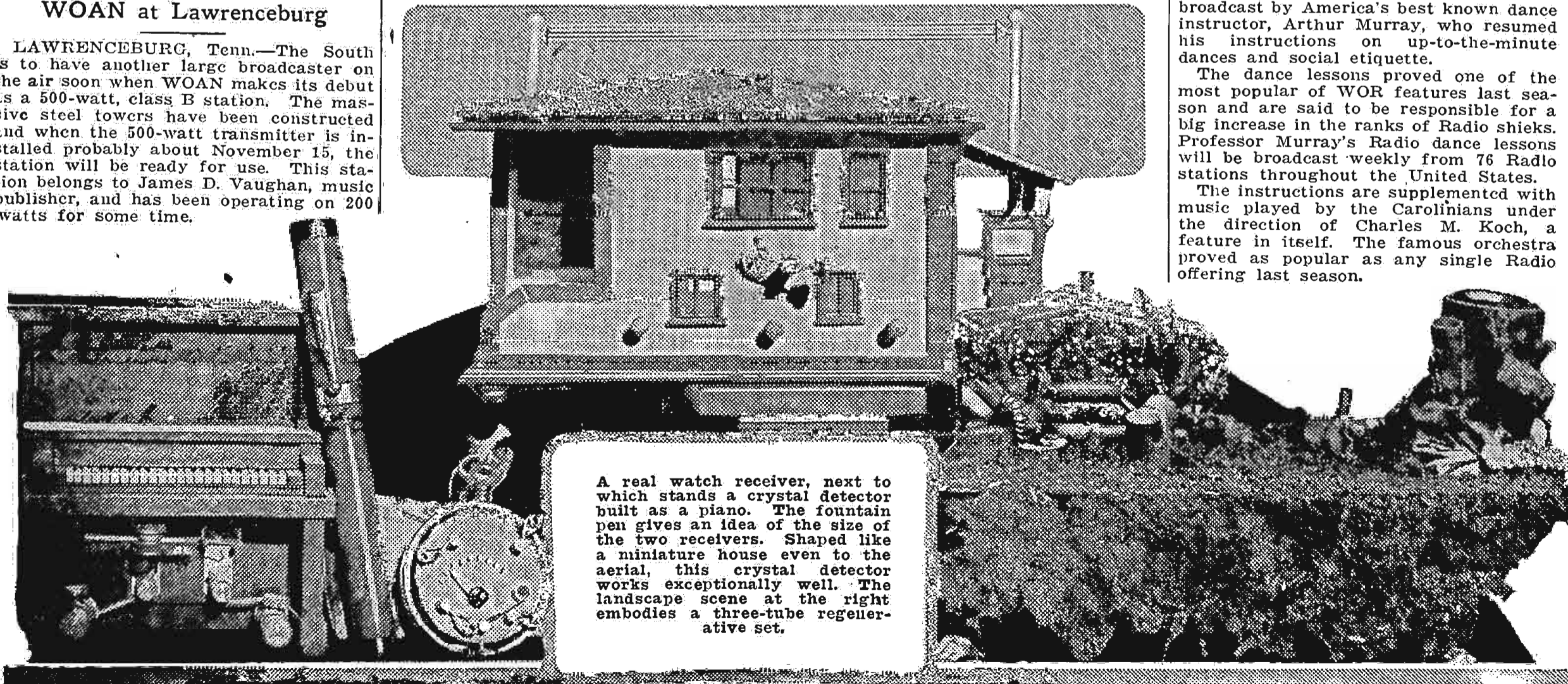
WOR Resumes Dance and Social Lessons

Murray, Famous Instructor, Tells How in Weekly Program

NEWARK.—Jimmy Caruso's ensemble, a favorite with Radio listeners, opened the regular Monday evening (October 6) festivities from WOR, and ushered in the broadcast by America's best known dance instructor, Arthur Murray, who resumed his instructions on up-to-the-minute dances and social etiquette.

The dance lessons proved one of the most popular of WOR features last season and are said to be responsible for a big increase in the ranks of Radio shieks. Professor Murray's Radio dance lessons will be broadcast weekly from 76 Radio stations throughout the United States.

The instructions are supplemented with music played by the Carolinians under the direction of Charles M. Koch, a feature in itself. The famous orchestra proved as popular as any single Radio offering last season.



A real watch receiver, next to which stands a crystal detector built as a piano. The fountain pen gives an idea of the size of the two receivers. Shaped like a miniature house even to the aerial, this crystal detector works exceptionally well. The landscape scene at the right embodies a three-tube regenerative set.

HOOVER PARLEY ENDS

(Continued from page 2)

the marine radio will always be heard to some extent.

C. W. Horn of the Westinghouse Electric and Manufacturing company also addressed the conference on interconnection and told in some detail of the experiments of his company with short wave lengths.

Experiment with Short Wave

He told in particular of the short wave length experiments which the Westinghouse company has recently been making between eastern points. He said that the broadcaster now must try to utilize short wave lengths. In this connection Mr. Horn spoke of the experience which his company had had with the Wills-Firpo fight which was broadcast to Buenos Aires, Argentina, and which was sent by short wave length. He said that his company is "now ready to do something."

The marine radio situation was discussed by George S. Davis, representing the American Steamship Owners association. While he went into various phases of the situation his chief plea concerned the abolishment of the spark system in the marine service.

Explains Shipping Benefits

Mr. Davis said that radio is a most valuable adjunct to the shipping business and he spoke in particular of the SOS call, the weather reports, the radio compass and the radio beacon as being a great boon to the shipping interests.

It costs between \$4,000 and \$5,000 as an average to equip a ship with radio and this has led to a large investment by the ship owners. They should not, he contended, be asked to do away with the spark system because of this. Mr. Davis admitted that the marine code signals have interfered with broadcasting but said these same problems of interference have always been existent. You cannot, he said, legislate interference out of the way, any more than you can legislate against static. The ship owners have solved many problems in the marine service through co-operation. Marine interference is small as compared with all other interference. There is more interference from regeneration than from code. He told the conference that the ship owners view with concern any attempt to abolish the spark system from the marine service.

Capt. Eckersley Talks

The radio situation as it exists in England today was explained in some detail to the conference by Capt. P. P. Eckersley representing the British Broadcasting

IS SATISFIED WITH CONFERENCE



Secretary of Commerce Herbert Hoover, who has just closed the Third National Radio Conference at Washington. Sixteen stations, stretching from coast to coast, were linked together for the simultaneous broadcasting of his opening speech. He was well pleased with the manner in which the conference handled the various problems on super power stations and the elimination of interference. Miller Photo

company. He spoke of the work now being done in England as compared to its beginning and of the differing conditions between English and American broadcasting.

Capt. Eckersley amused the conference by stating that the British government in 1922 as a great concession allowed a broadcasting station to entertain the public a half an hour a week. By the end of 1922, however, England had awakened to the possibilities of radio. He admitted, however, that it is even now miles behind the United States.

He spoke of the combination of the six big English manufacturers for the erection of a broadcast station and told of the government's licensing of receivers. In 1922, he said, only about 10,000 licenses had been granted. Today England is celebrating the issuance of its millionth license.

English Distribute Stations

The radio manufacturers first erected eight broadcast stations distributed uniformly throughout England and later this was supplemented by what are known as

relay stations which are linked up by wire. Within the past few months he said, this service has again been supplemented by a new super power station. Capt. Eckersley stated that through the distribution of these stations fully 50 per cent of the listeners in England use crystal sets and the new super power station reaches crystal sets within a radius of 100 miles.

Capt. Eckersley urged the linking up of the two continents. He said that in his opinion very high powered stations would be necessary to accomplish this.

He also suggested the possibility of a world broadcasters association which might be mutually helpful.

Would Cut C Stations

Several of the committees of the conference urged that the class "C" licenses issued by the department should not be renewed and one of the committees suggested that in the future not more than two class "B" licenses be allowed in any one locality on the same wave length. The allocation committee reported to the conference that it considered the

present general organization of broadcasting stations satisfactory. The committee suggested that no change be made in regard to the broadcast development class of stations.

"There are at present only two such stations," said the committee, "and they are considered as experimental. There seems to be no good reason to change their requirements or to attempt to fit them more closely into the general scheme of broadcasting stations than at present."

The same committee recommended that a small continuing committee be designated by the conferences to remain in Washington and collaborate with the radio supervisors in a reassignment of the broadcasting station frequencies in accordance with its suggestions.

Oregonian Orchestra Gives First Concert

Organized as Result of Questionnaire Asking Concert

PORTLAND.—The first concert given by the newly organized Morning Oregonian concert orchestra was radiocast from the paper's station, KGW, on October 20.

A questionnaire was circulated for several weeks asking listeners-in to tell what kind of music they enjoyed most. Seventy-five per cent asked for high grade concert music. The orchestra is the result. They will play every Monday night.

Four noon-time concerts, lectures and dance programs will be given during the week. On Friday night the climax will come in the form of the big Hoot Owl meeting.

Present King George with Set for Buckingham Palace

LONDON.—Great Britain has in King George a very enthusiastic radiophan. Not long ago His Majesty accepted a specially-designed radio set for Buckingham Palace, presented by the British Broadcasting company as representative of British radio manufacturers.

Mahogany and ebony, beautifully inlaid with ivory, boxwood, and mother-of-pearl were used in the cabinet, which was executed by a famous furniture manufacturing concern. Within two minutes of the installation of the set, King George was receiving a program.

Why it is Better

LOOK at this illustration—see for yourself the eleven distinctive features in the construction of the Federal Condenser. Every feature is a distinct point of superiority—essential to clear, sharp tuning and clear reception.

You can get the outstanding advantages of Federal Tone and Federal Selectivity in your pet hook-up only by insisting on Federal Parts.

There are over 130 Federal Standard Radio Parts bearing the Federal iron-clad performance guarantee. Use them—for your own protection and enjoyment.

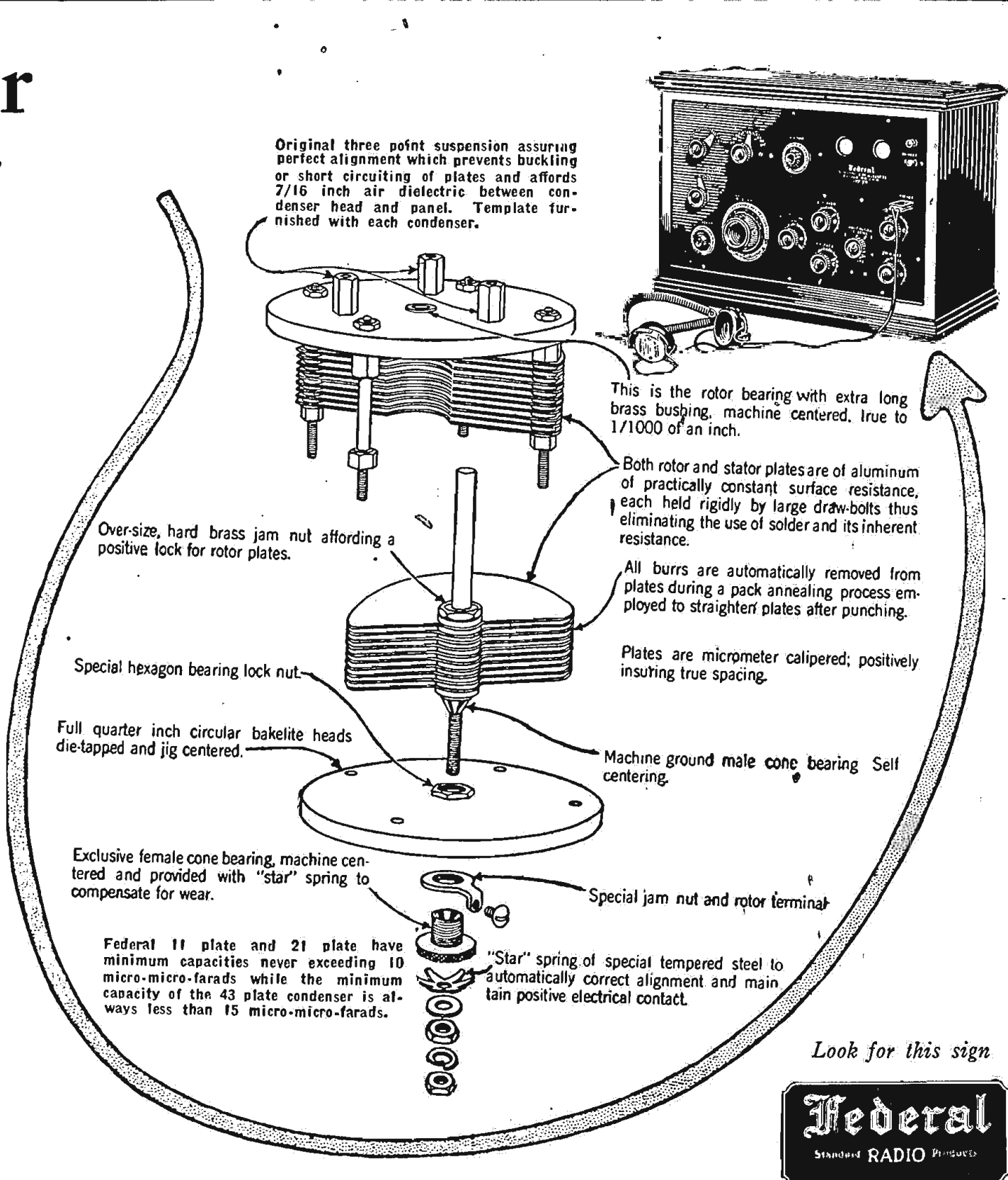
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WGN FEATURES NEW MUSICAL PROGRAM

PRESENTS OPERATIC ARIAS EVERY OTHER SUNDAY

Celebrated Chicago Symphony Orchestra Under Nathaniel Finston Leads List of New Acquisitions

CHICAGO.—The Chicago Theater symphony concerts and twin organ recitals, presented every Sunday morning, have been added to the musical programs of Station WGN.



Nathaniel Finston

Musical Director Nathaniel Finston of the Chicago Theater alternates on every second Sunday symphony concerts and grand opera in English with the twin organ recitals by Mr. and Mrs. Jesse Crawford. The concerts and organ recitals go on the air at 11:45 every Sunday morning and run for a full hour.

In addition to this Sabbath feature, WGN has augmented its schedule with three hours of classical music every Sunday afternoon—known as the Tribune Master Artists' Concerts, offered between 2:30 and 5:30 p. m. Only faculty artists are booked for the Sunday concerts, part of which is an hour and a half of concert and organ music relayed from the Central Music hall, presented by the Chicago Musical college.

The Lyon & Healy Artists series of concerts, formerly broadcast by WMAQ, have also been annexed by WGN and are put on the air between 2:30 and 3:00 every afternoon except Saturday and Sunday. Organ recitals will be broadcast by WGN every evening between 6:00 and 6:30.

Give all Types of Music

The widespread popularity of the Chicago theatre symphony orchestra is due to a peculiar "secret" behind its presentation. The secret is that it presents symphonic, operatic, ballet, or popular music with the same expertness as other celebrated organizations which specialize in only one type of music.

To Nathaniel W. Finston, musical director, goes most of the glory for the organization. Though a surprisingly young man, his success is not surprising when you are told that at 13 he was one of the musical prodigies of America, noted for his violin talent. His training and education is strictly American in background and entirely liberal in scope.

Introduces Sunday Concerts.

Under his administration of musical affairs at the Chicago, he introduced the Sunday noon popular symphony concerts, now entering the fourth season. Last season, seven operas in English were given as part of the Sunday noon concert season, and during the forthcoming season, at least seven more are planned.

The greatest of symphonic works, to delight the heart of the conservatory student, or the music for the untutored ear of the masses, have, as a matter of policy, been balanced on each program.

Plays at WEEL; Gets Concert Engagement

Young Entertainer Booked Five Minutes After Performance

BOSTON.—While the new Edison station WEEL is not listed as an entertainment booking office the staff in the broadcasting department is always glad to do anything possible to provide talent at concerts or to get their artists professional work.

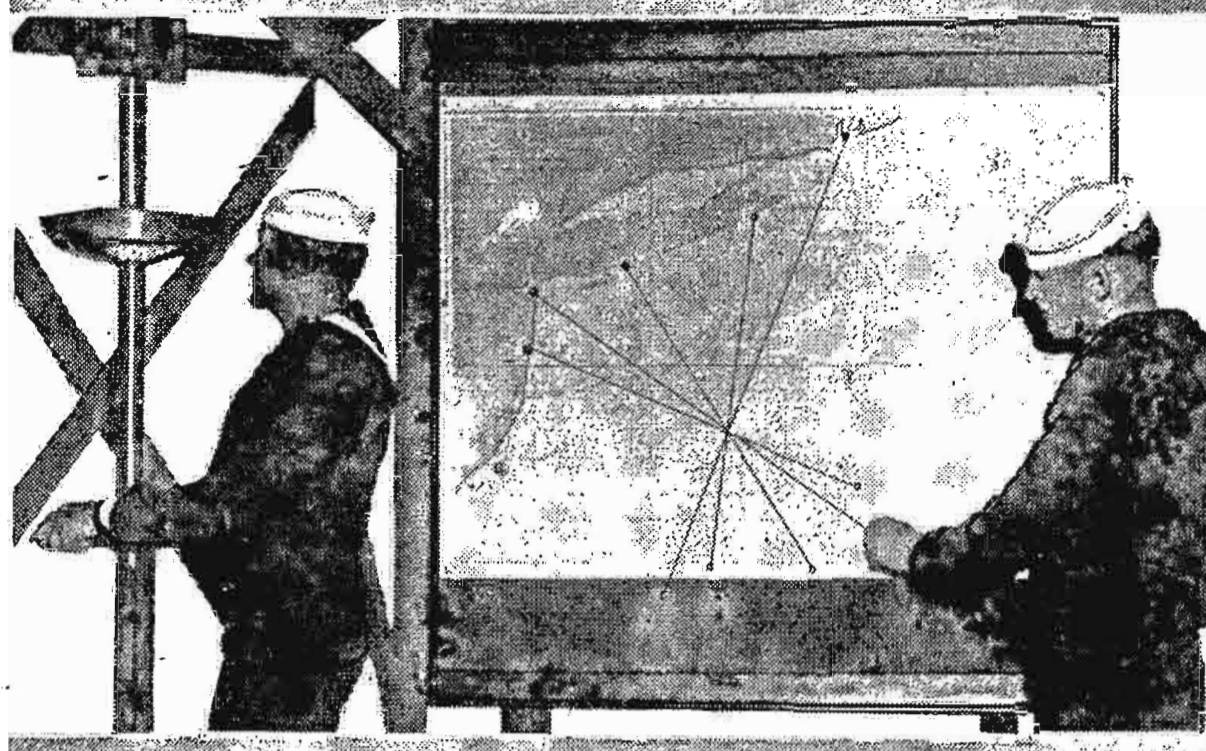
This co-operation on the part of the broadcast officials is taken as a high commentary on the type of programs being broadcast from WEEL. Miss Lillian Clark, the 14-year-old harpist who played from the Edison station Tuesday evening, not only received honorable mention in the "listeners columns," of the newspapers but her debut was directly responsible for a concert engagement.

A few minutes after her recital a man called the Radio station and inside of two minutes she was booked to appear at a concert later in the week.

Municipal Band to Broadcast

MADRID, Spain.—The famous Municipal Band of Madrid, one of the most celebrated bands in Europe, will now give concerts over the ether lanes, on a schedule to be definitely arranged later. The tentative plan is to have daily concerts from 10 a. m. to 12:30 p. m., local time.

LATEST AID TO U. S. NAVIGATORS



Newest model Radio compass which is being used by the U. S. Navy in finding the direction of ships and taking compass bearings. It is being used by most of the first class liners of today for this purpose. This unit was part of the Navy exhibit at the recent Radio World's Fair, and caused much comment on the part of visitors who wondered how ships were steered in a fog. By obtaining sufficient bearings from other ships, land or compass stations, the exact position of a vessel is determined, using the crossed strings as shown above.

Vast Throng Hears Great Conference

Place Loud Speakers on Tabernacle Grounds and Broadcast Huge Mormon Meeting from KFPT

SALT LAKE CITY.—The proceedings of the great Mormon or Latter-Day Saints Church conference, an institution older than the state of Utah, were Radiocast from Station KFPT located on the Deseret News building.

Loud speakers were set up on the tabernacle grounds so that thousands of people unable to find seats in the big auditorium might be able to hear.

Herber J. Grant, president and prophet of the church, opened the session. Concerning Radio he said: "It is the most marvelous and wonderful invention of the age. It is almost beyond human comprehension in its ability to carry the human voice thousands of miles through space."

It is estimated that the proceedings of the conference reached over one million people.

Transmit Good Photos

LONDON, Eng.—Among the remarkable achievements exhibited at the sixty-ninth annual exposition of the Royal Photographic society, were a number of photographs transmitted by Radio. The absence of the streaky effect so long discernible in such photographs was an improvement particularly noticeable

How I Average \$12 a Day in RADIO WORK

By Howard Houston

"YES, Mr. Crosby, I'll have the set installed tonight . . . yes, all ready to 'listen-in' . . . sure you'll be able to get Washington by 9 o'clock."

Another hour and a half job! And another ten dollar bill in my pocket! It all seems like a dream. But let me tell you the whole story from the very start.

A few months ago, I was driving a bread wagon, selling bread to retail stores. I had a good route though, and if I do say so myself, I had built up a pretty good business. But try as I could, thirty-five dollars a week was all I could make that job pay.

I'd be working there now if it hadn't been for Mary. We'd been "keeping company" for about two years and everything was all set for our getting married as soon as I would be earning more money. But the old job didn't hold out much promise—and I didn't see how I was qualified for any other work that would pay more.

It was Mary who gave me the tip. "You can't earn big money," she said, "unless you're some kind of a specialist. Learn some line of work—become an expert in it." But what business, profession or trade was there that wasn't overcrowded? Where could an ambitious fellow stand a good chance to earn big money and get ahead? Stenographers, accountants, clerks—all down the line—every well established line of work was overcrowded, and the pay was small.

Then Mary said, "Why not find a new field?" That was a good thought. The men who went into the railroad business early "cleaned up." The same was true of the movie game, the automobile business—but what was the coming field? What new development was there that looked like a new promising industry?

We both jumped to our feet.

"RADIO."

Why hadn't we thought of it before? All around us was the evidence of the tremendous development of Radio. The broadcasting stations sprouting up all around—the rapid increase in Radio Stores—new radio manufacturing plants—everybody talking about the latest radio program. Radio had captured America almost overnight—and thousands of men who were on their toes were due to make fortunes out of it.

Thousands of Men Needed

The very next day after I had finished my route, I went to several radio business firms. "Sure, there was an opening. Oh, they'd pay big money—but did you know Radio?"

That was my cue. Learn Radio. Become a Radio Expert—and I did!

Well, that really is my whole story. I've only started. I've followed the path of least resistance. Sort of built up a business of my own installing, building, and repairing radio sets. Any small job pays me at least \$5—and usually \$10. I can easily make from \$50 to \$100 a week—and more as I get my work systematized.

What Mary and I have got to decide after our honeymoon—oh, yes, we are soon having a very quiet wedding—what we must decide after that—is which end of Radio will be best. You see, there are dozens of different kinds of work in this field, it's so big. I've already had several offers—one to take charge of a radio department, another with a broadcasting station, another to give radio entertainments, and a good offer as superintendent of construction in a radio plant. What we want to decide on is which will not only pay the most money now but will lead to the most rapid advancement in the future.



"Ah! there's Washington coming in clear as a bell."

Easy to Learn Radio at Home in Spare Time

Just a word about this Radio business. Some fellows think you've got to have some training before you start to learn Radio. That's bunk. I didn't know the difference between an amplifier and a doorknob before I started. But let me give you a tip. Don't experiment with your Radio course. Get the best. The National Radio Institute has been teaching Radio ever since 1914. The government recognizes its course by allowing credits to its graduates when they are trying for a license, so you see you can be confident you're getting the best training possible—and that means a lot.

This course is the only absolutely complete one now being offered which qualifies for a government first class commercial license. It gets you the bigger paying jobs in Radio.

Send for Free Book "Rich Rewards in Radio"

Incidentally, the National Radio Institute publish a mighty interesting book on Radio. They send it out without cost to anyone who wants to learn about Radio. It is filled with facts, photos, and figures on the Radio industry, and tells all about its course which quickly prepares you right at home in spare time for one of the big pay positions in Radio.

Take my advice and Mary's—and send for that, no matter how little you know of Radio, or what your plans are. For a short time they are offering a reduced rate for those who enroll now. Act promptly and save money. Just mail the coupon today. Address the National Radio Institute, Dept. 55KA, Washington, D. C.

NATIONAL RADIO INSTITUTE, Dept. 55KA, Washington, D. C.

Please send me without cost or obligation your Free Book, "Rich Rewards in Radio," which tells all about the opportunities in Radio, and how spare time study at home will qualify me for a big paying radio position. Also full details on your Free Employment Service.

Name..... Ago..... Address..... City..... State.....

Pay Increases Over \$100 a Month
I am averaging anywhere from \$75 to \$150 a month more than I was making before enrolling with you. I would not consider \$10,000 too much for the course.
(Signed) A. N. Long, 121 No. Main St., Greensburg, Pa.

Doubles Salary
I can very easily make double the amount of money now than before I enrolled with you. Your course has benefited me approximately \$3,000 over and above what I would have earned had I not taken it.
T. Winder, 731 Bedford Ave., Grand Junction, Colo.

From \$15.00 to \$80.00 a Week
Before I enrolled with you I was making \$15 a week on a farm. Now, I earn from \$2,080 to \$4,420 a year and the work is a hundred times easier than before. Since graduating a little over a year ago, I have earned almost \$1,000 and I believe the course will be worth at least \$100,000 to me. (Signed) George A. Adams, Route 1, Box 10, Tamaqua, Pa.

WQJ ENTERTAINS AT "KAFFEE KLATSCH"

300 IN ATTENDANCE EVERY SATURDAY AFTERNOON

Domestic Science Students Meet Weekly at Station to Discuss Lessons Over Coffee and Doughnuts

CHICAGO.—"and when I whipped in the eggs * * * well, Mrs Brown, the first way is, the best * * * why, it was so lovely and crisp * * * no idea what a time saver it is. * * *"

So the "Kaffee Klatsch" is in session. Already 1500 have signed their membership cards in this new organization. They are the women who listen in to the daily domestic science programs Radiocast from the Calumet Baking powder and Rainbo Garden Station WQJ.

Every Saturday afternoon at 3 o'clock 300 of them gather together in the Radio room where they are served coffee and doughnuts. And here they have a chance to discuss the domestic science lessons of the week. Invitations for 300 women are sent out each week because of the impossibility of having the entire membership gather in the limited space.

Out-of-town listeners are regaled with a special "Kaffee Klatsch" program which is broadcast.

WQJ invites every listener to join the organization and attend the meetings.

CANADIAN LISTENERS HEAR BRITISH SAILORS

Concert Party of H. M. S. "Curlew" Entertains at CKAC

MONTREAL.—Time was when the thoughts of the sailor went no further than the sheets he sailed under. But now—

Rivaling the versatility of the most accomplished musicians and ranging from fugues and sonatas to monologues, the "Curlew Cyclones," concert party of H. M. S. Curlew, Radiocast entertainment from Station CKAC of the Montreal "La Presse," recently on their first appearance in North American waters.

DOLLIE AND JOHNNIE LISTEN IN



PEOPLE have written reams about receiving programs on bed springs, door knobs, and numerous other contrivances, but the best of all is the one Dollie Childs, with Johnnie, her dog, actually receive programs on. It is a Winchester shotgun.

Using the shotgun for an aerial, they have received WOS, KFKX, WDAF and WLS from their home in Speed, Missouri. Johnnie, the dog, has a special headset made to fit him. He listened in until the hunting season opened and then signed off.

Dollie claims that by using the shotgun as an aerial, a lot of noise is eliminated. Not only that, but the shotgun may be used hunting afield for the pur-

pose of receiving concerts when sitting around the campfire.

Being "pals" when at home Dollie and Johnnie listen in together, and when out hunting they also work together. While Johnnie runs down rabbits and squirrels, Dollie yells with glee as her Dad shoots them. Then Dollie and Johnnie help to carry them home.

University of Wisconsin Station Resumes Programs

MADISON.—Radiocasting from the University of Wisconsin Station WHA was resumed on October 13. Prof. W. H. Lighty of the university extension division is in charge of all arrangements. The station has made application for

a class B rating in view of the new equipment added during the summer. The station will be open to visitors Monday, Wednesday and Friday noons.

SAVANT ASKS HELP IN OBTAINING MARS DATA

Radiophans Requested to Report Times of Unusual Phenomena

NEW YORK CITY—Assistance of all Radiophans has been asked by Prof. David Todd, noted astronomer, in an attempt to ascertain whether or not Mars' magnetism, or other factors, were responsible for the electro-magnetic phenomena registered when Mars was close to the earth.

This Radio check-up may give the world much knowledge concerning the planet.

Prof. Todd asks that all fans who listened in between July 24 and September 24 and noticed a strengthening and diminishing of whatever was on the air, send in a record of it with the times of the differences in intensity. Reports covering a day or so will be greatly helpful, but those of only an hour will have value.

These reports should be addressed to Prof. Todd, Chairman of the Mars check-up at the Aerial League of America, 280 Madison avenue, New York city.

This information will be tabulated and compared with other tabulations of the magnetic variations registered for the same period of time, and data from astronomical observations of Mars. It is expected that the results will make it possible to ascertain whether Mars and other planets affect the earth's conductive media and aid or interfere with our Radio communication.

Scientists are placing great reliance on the results of the check up. Everyone who noticed any particular phenomena is requested to send in a report with the time at which it occurred.

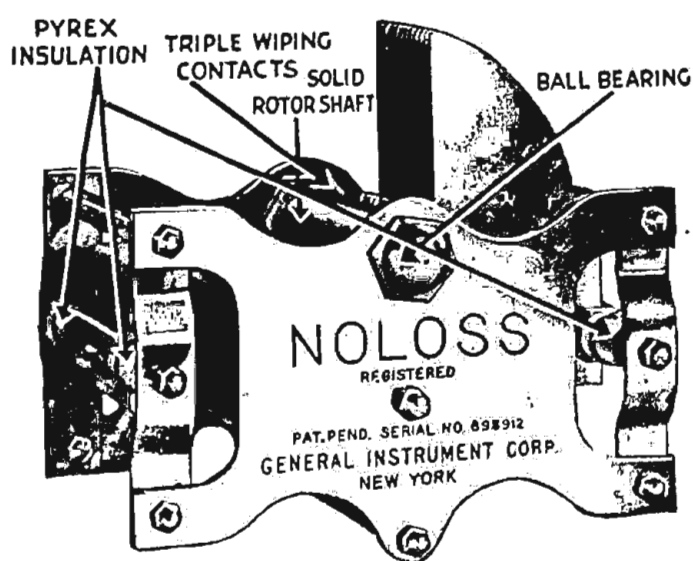
Broadcast Description of Murderer Leads to Arrest

LONDON.—Considerable interest has been created in England by the arrest of a murderer at sea by the use of Radio. William Breant murdered his mother-in-law in Liverpool, and then escaped and put to sea aboard an oil-tanker. A Radio message to the ship caused the captain to arrest the man.

NOLOSS

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51B	.0005 mfd.	13 mmfd.	6.50
51P	.001 mfd.	20 mmfd.	7.00
52D	.0005 mfd.	13 mmfd.	9.00
52P	.001 mfd.	20 mmfd.	9.50

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GENERAL INSTRUMENT CORP.

423 Broome Street
NEW YORK CITY



Herald MODEL B



The Big, Clear Voice of Radio!

\$18

A NEW Herald—clear—loud—with a tone that is wonderfully mellow and sweet. Height 25 inches. Bell 12 inches. Fibre horn and art metal base. No batteries required. No adjustment necessary. Hear the Herald Model B at your dealer's.

Herald Electric Co., Inc.
113 Fourth Avenue, New York

EXPLAIN DISASTERS BY NEGREI'S THEORY

RINGS GATHER CHARGES AT STATION'S MID-POINTS

Rumanian Savant Advances Theory as Cause of Recent Catastrophe at Army Base in Bucharest

By Frederick Delano

PARIS.—That Radio waves can and do produce charges of electricity in certain pieces of iron—such as rings—which discharge as small sparks and have caused many of the hitherto inexplicable disasters, such as that of last May in Bucharest, is the interesting and novel theory of the Rumanian savant, General Negrei, director of the technical department of the Rumanian Army and Professor of ballistics of the Bucharest Military school.

The explanation of this phenomena advanced by General Negrei is simple and is backed by a heavy barrage of mathematics and scientific data.

Rings Act as Condensers

The general maintains that from his own studies and experiments, as well as from the findings of many other savants, it appears that Radio waves produce, in such objects as iron rings broken by a small cut, and not attached to or in connection with the earth in any manner, small electric charges. In other words, these iron rings act as condensers to store the tiny amount of energy radiated by various wireless stations—actually the reception of energy by induction.

This energy would not, under ordinary circumstances, be of any serious consequence. But after a long time of charging, if a small enough distance existed between such a "condenser" and the ground or if a path to the earth were found, the ring might then discharge its load across any intervening air, in the form of a tiny spark. The rest is obvious, in case the spark were to come in contact with even a grain of powder in one of the big ammunition centers.

Mid-Points Dangerous

The action of such Radio waves in producing induced energy in iron rings is probably greatest, says General Negrei, at the meeting point of two series of Radio waves. Thus, in the Bucharest explosion, it will be found that Bucharest is centrally located between the big sta-

PATT LEAVES WDAF TO FINISH COLLEGE



John F. Patt

KANSAS CITY, Mo.—John F. Patt, formerly assistant Radio editor of the Kansas City Star and announcer for WDAF, has been granted a leave of absence from the Star to complete his college work at the University of Kansas at Lawrence. While attending school Mr. Patt will be assistant director of the new 500-watt station which is being installed by the university and which will be opened about the first of January.

Leo Fitzpatrick is the director and chief announcer of the station. He will continue to act in this capacity.

tions of Nauen (Germany) and Salonica. This explosion, which brought about these investigations was that of Fort Cotroceni, just outside the city, on May 28, 1924. The entire fort was destroyed, serious property damage was done, and many lives were lost.

Explains Other Disasters

This theory would also explain, points out the general, the mysterious burning of the two steamers at Toulon, which is halfway between Paris and Bizerta. Likewise the Italian steamer Volturno, which caught fire from unknown causes in mid-Atlantic, may well have been in the exact range between the big Ste. Assise station near Paris and one of the American Radio centers. The explosion, in 1921, of Fort Cotroceni, near Bucharest, could also be explained thus, according to the Rumanian savant.

Start CKY Farm Service

MANITOBA.—Farmers and others interested in agriculture are invited to write the Manitoba Agricultural college asking questions coming within the scope of the college courses. They will be read and answered from Station CKY during the usual lunch hour programs.

Football Radiocasts

October 25

Chicago-Ohio at Columbus, WEAO (360).
Harvard-Dartmouth, WBZ (337).
Michigan-Wisconsin at Michigan, WGN (370).
Minnesota-Iowa at Iowa City, WHAA (484).
Pitt-Tech at Pittsburgh, WCAE (462).
Princeton-Notre Dame at Princeton, WEAU (492), WGY (380), WJZ (455).

November 1

Harvard-Boston, WBZ (337).
Purdue-Chicago at Chicago, KYW (536), WMAQ (447.5).
Iowa-Illinois at Illinois, WGN (370).
West Point-Yale at New Haven, WEAU (492), WGY (380), WJZ (455).
Wooster-Ohio at Columbus, WEAO (360).

Government Fosters Private Radiocasters

Recommend Stations Be Used for National Emergencies

WASHINGTON.—The government will foster and encourage the development of privately owned and operated Radio stations in such a manner that they will be available for national defense in case of a national emergency.

This is the outstanding feature of a report recently issued by the Interdepartmental Radio Advisory committee concerning the government's Radio policy.

According to the report this encouragement should consist in utilizing the services of commercial stations wherever government interests warrant it to accomplish certain services.

Recommendation is made by the committee that no station be erected in the vicinity of a government station until it has been investigated by the interdepartmental organization and found to fulfill necessary qualifications.

In the program, just made public, a wide range of subjects is discussed including regulation of both government and private stations and the government interest in Radio communication.

RYAN TO ANNOUNCE GRID YARNS AT WGN

TRIBUNE STATION TO GIVE 5 BIG MIDWEST GAMES

Complete Story of Michigan-Wisconsin, Illinois-Iowa, Notre Dame-Nebraska and Illinois-Ohio

CHICAGO.—WGN has contracted with the American Telephone and Telegraph company for direct private lines from three stadiums for the broadcasting of the biggest midwest football games.

Illinois tied Michigan last season for Conference championship, so WGN put this year's Illinois-Michigan contest on the air last Saturday, October 18, broadcasting from Urbana, Ill.

Quinn A. Ryan, publicity director and announcer of WGN, is reporting the gridiron combats for the station. Mr. Ryan covered the Big Ten games for the Chicago Tribune for three

years and was for a long time associated with the paper in various capacities. He has been reporter, advertising writer, house organ editor and one of the book reviewers of the Tribune, and conductor of two humorous sports columns. He will be remembered as the comic announcer who made known each act in verse last winter and fall in the Chicago theater shows broadcast by WMAQ.

The other games to be broadcast by WGN are: Michigan vs. Wisconsin, at Ann Arbor, Oct. 25; Illinois vs. Iowa, at Urbana, Nov. 1; Notre Dame vs. Nebraska, at South Bend, Nov. 15, and Illinois vs. Ohio State, at Urbana, Nov. 22.

"L'Antenne," the French Radio weekly, announces that between 162 meters and 650 meters thirteen different harmonics can be counted in the Eiffel Tower arc transmission.



Quinn A. Ryan



Both Must be Musical Instruments

Model S Audiophone, \$25
Rubber Horn 14½-inch diameter. Velvet mat finish of mottled bronze and gold; classic base.

BRISTOL AUDIOPHONE

TRADE MARK REG. U. S. PAT. OFFICE
LOUD SPEAKER

THE BRISTOL COMPANY
Waterbury, Conn.

IF you are to enjoy the rich resonance of an old Cremona violin, your loud speaker must also be a true musical instrument. So designed and powered as to respond as faithfully to the inspiring crescendos of a Wagner opera as to the whispers of a Moonlight Sonata.

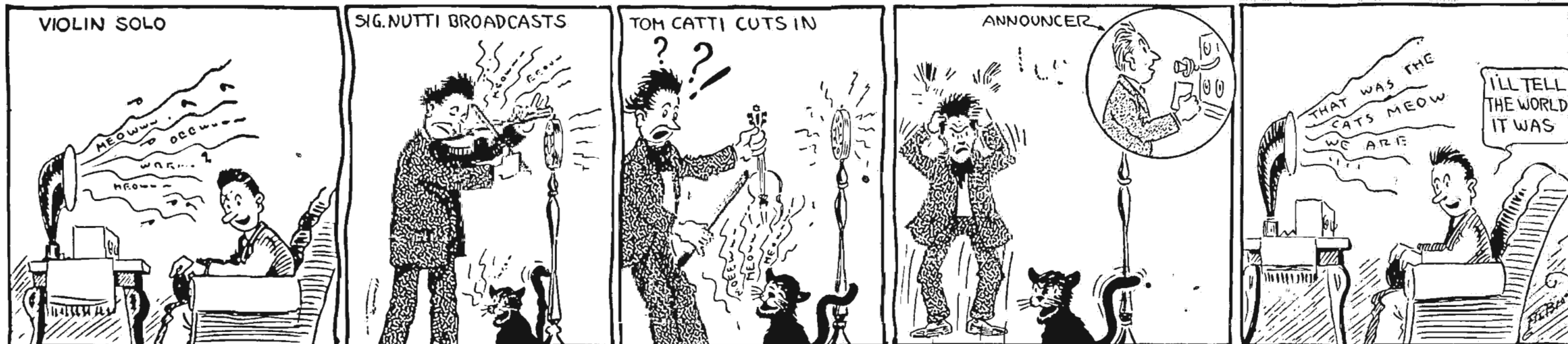
The new Bristol AUDIOPHONE does that. With its joyous, open-throated Rubber horn, and its finely adjusted transformer, it is on a musical plane with the noblest instrument or voice at your favorite station.

In addition to Model S, shown here the Bristol line includes Model J, \$20, Baby Grand, \$15, and the "Baby" at \$12.50. Send for bulletins AY-3017 and 3011, mentioning the name of your dealer.

THE ANTENNA BROTHERS

Spir L. and Lew P.

Paging Mr. Darwin



SEEK NEW LOCATION WITH PORTABLE SET

TRUCK CARRIES COMPLETE TRANSMITTING STATION

Collapsible Masts 55 Feet High Carry Braided Wire Aerial to Give Greater Flexibility

CHICAGO—"This is Station WJAZ broadcasting on a wave length of 268 meters and using 100 watts output." If you should hear this phrase, it will mean that you have been listening to the new portable transmitter which this station is using.

It is built upon a motor truck and is self-contained. Everything necessary for the broadcasting of programs is carried. This truck is capable of charging all the batteries used while the station is in operation.

The aerial is extremely novel, consisting of four heavily braided copper wires with an extremely fine wire making them very flexible. The masts used to support this aerial are similar to the ones used by the government during the war. They are built in sections so that they may

collapse into each other. The total height of the mast is fifty-three feet.

The entire framework and body of the truck, including the iron strips on the floor are connected together and grounded. The grounded strips are brought together to one point at the side of the truck where a heavy connection lug is attached. Special arrangements are provided whereby the microphones can be placed as far as 300 feet from the truck, allowing broadcasting of performances in halls while the truck is parked outside. Three microphones may be used, one for announcing, one for orchestra and one for studio purposes where necessary.

Use Gold Plated Wiring

The entire wiring of the set is by bus bars. Each is gold plated following the Zenith practice. Three stages of push-pull amplification are used in the line amplifier which is connected to a five-watt speech amplifier.

This portable transmitter is making a tour of the cities surrounding Chicago to determine the best location for the erection of the new Zenith station. Many towns have been visited, and the Chamber of Commerce in numerous other towns have asked that the truck visit them.

After a program the aerial can be taken down, packed up, the truck closed and started on its way in ten minutes.

According to reports of the United States shipping board, the Leviathan is equipped with the best Radio installation.

New Chicago Station Slated to Open Soon

Bureau of Navigation Assigns WBCN as Official Call

CHICAGO—"WBCN, Chicago." Chicago Radiophans will soon hear this call if the promise of the Western Electric company to deliver the new 500-watt broadcasting set to the Southtown Economist early in November holds good. The call letters, "WBCN," have been officially assigned to the Economist station, which is to be operated by the publishing firm of Foster & McDonnell. Word of the assignment came from the Bureau of Navigation recently.

The significance of the letters is: "World's Best Community Newspaper."

A number of distinct innovations in programs are in store for WBCN listeners, according to Robert Northrop, director, who announces that the new station's policy will be considerably different than the average.

Improvements at CKY

WINNIPEG, Man.—Improvements at the Manitoba Station CKY, involving raising of the masts and alterations in the studio and operating plant, are now under way.

JACKSON GIVES BOOK CRITICISM FROM KGO

Word Pictures of Books and Their Makers Entertaining

OAKLAND—Last year there were about 6000 books published in the United States. The average reader will find only a few of them of sufficient interest to be worth his time to read. So now comes Radio to help him select.

On the KGO Monday evening programs, Joseph Henry Jackson, well-known authority on books, tells in his own way just what he thinks are the better books, and also something about authors.

Here is a sample of the way Jackson begins a book chat: "Last week I promised to tell you about two books, one of them good and one of them bad. I apologize—they are both bad."

Hear WLS in Alaska

CHICAGO.—WLS Unlimited has made its longest journey. Breaking all previous distance records by traveling the spaces of the air for almost two and a half thousand miles, L. E. Edwards, a United States Army lieutenant stationed at Chilkoot Banks, Haines, Alaska, 2,400 miles away, tuned in on the program of the Sears-Roebuck Agricultural Foundation's station.

Look for the Name WALNART on Your Radio Purchases

This trade mark is your guarantee of reliable, dependable radio apparatus. Look for the name Walnart. It means trouble-proof radio products. They are:

Unbreakable unconditionally guaranteed tube sockets, "B" Battery and Inductance Switches, Variable Condensers (plain and vernier), Vernier Adjusters, Dials, Variable Grid Resistances, Lettered Binding Posts, etc.

You cannot afford to buy inferior parts.

Write for literature

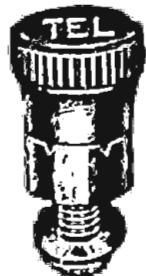
WALNART ELECTRIC MFG. CO.

GREEN ST. AT JACKSON BLVD., CHICAGO



Walnart Multiple Gang Sensible Sockets, insulated with Bakelite-dielcto, come in two or three gang types, for standard or UV-199 tubes. Single sockets, 50c.

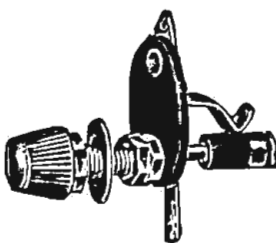
Walnart Variable Condensers, plain and vernier, do not "cutout" or develop wobbliness. Plates accurately pressed, permanently aligned and locked in slotted studs fastened in Bakelite ends. List prices: Plain, 3-plate, \$1.25; 5-plate, \$1.50; 13-plate, \$2.00; 17-plate, \$2.50; 23-plate, \$2.75; 43-plate, \$3.00. Vernier, 13-plate, \$4.00; 23-plate, \$4.50; 43-plate, \$5.50.



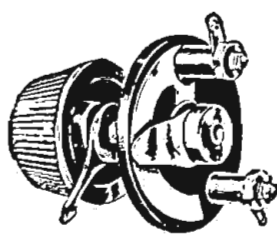
All popular Walnart "Tel-Posts" (lettered binding posts). 800 and up, list 5c. Plain, 4c.



Walnart Friction Vernier Adjuster. Bakelite knob. List 25c.



Walnart Filament Switch. One hole mounting. Bakelite-dielcto base. Push and pull type, 30c.



Walnart Variable Grid Resistance. List \$1.00. With fixed condenser \$1.25.

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"Makers of Good Goods Only"

HAROLD BOLSTER on behalf of the Principal Radio Manufacturers and Dealers of America

Presents—

This greatest radio show ever held will be profit-sharing with exhibitors

Special Election Week Program Features



"The World and his Girl will be there"

NEW YORK CITY Featuring, in advance, the most striking developments in the Radio art and the Radio industry for the coming year

- Receiving Set Models for 1925
- Phonograph Radio Combinations for 1925
- Improved Equipment for 1925

American Radio Exposition Company

Director: HAROLD BOLSTER General Manager: J. C. JOHNSON 522 FIFTH AVENUE Telephone: Vanderbilt 0068 NEW YORK

Secrets of Selectivity and Regeneration

Part II—Selectivity in Series of Tuned Circuits

By William W. Harper

IN the preceding article of this series, a review was given of the conditions necessary for selectivity in a simple receiver. It was shown that the limit of selectivity in such a system is reached when the circuits are adjusted to the point of critical regeneration; assuming the coupling to the antenna does not exceed the critical value.

Recent experimental investigations have disclosed that by increasing the number of tuned circuits the selectivity can be very noticeably improved in comparison to that obtainable in the simple receiver where only one circuit of low decrement is utilized. This system of gaining increased selectivity was first suggested by Alexanderson (see U. S. Patent No. 1,173,079) and when designed so as to obtain the maximum effect of regenerative phenomenon very satisfactory selectivity is possible.

Selectivity Increased.

A simplified case of the application of these principles is illustrated in the circuit diagram of Figure 5. In this instance, two sharply tuned low resistance circuits are used, namely, LC and L1C1. The resistance of the circuit LC may be reduced to a very low value by regenerative action, which will be described later. The resistance of L1C1 in this case is made as low as possible by careful design.

It will be clear that in this arrangement the regenerative action is localized in the amplifier tube A and the detector tube R is substantially non-regenerative. This condition differs from the simple cases cited in the first article of this series (Figures 3 and 4), wherein the regeneration was confined to the rectifier tube. The superiority of regeneration external to the detector tube has recently been emphasized by Little (see Proc. I. R. E. Aug. 1924).

Many interesting and perplexing conditions arise in systems of this type. These conditions are mainly due to the regenerative phenomena which are likely to escape the observation of the experimenter.

The theory of a specific case, as depicted in Figure 5, will be useful in formulating a fundamental concept of the re-

generative activity in a coupled amplifier. In this scheme, the energy absorbed by La from a certain wave induces high frequency alternating current into the secondary tuned circuit LC. The frequency of these potentials created in LC is dependent upon the wave length to which

in a magnified form in the plate circuit of the amplifier

To gain selectivity between La1 and L1 we have also adopted critical coupling, which, in this case, means that La1 is very much smaller than L1. (Usually by a ratio of approximately 1 to 5.) It fol-

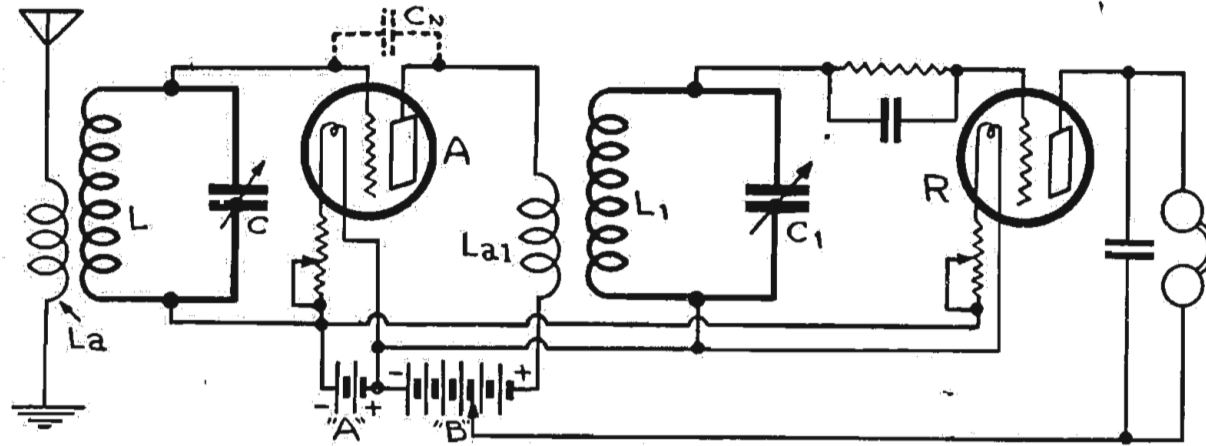


Figure 5

this circuit is tuned. The grid of the amplifier, A, being connected to the high potential point of the circuit LC, will follow the same cycles of potential varia-

tions that the period of the plate circuit will be greatly above (indicating a lower wave length) that of either of the tuned circuits LC and L1C1. Therefore, it is

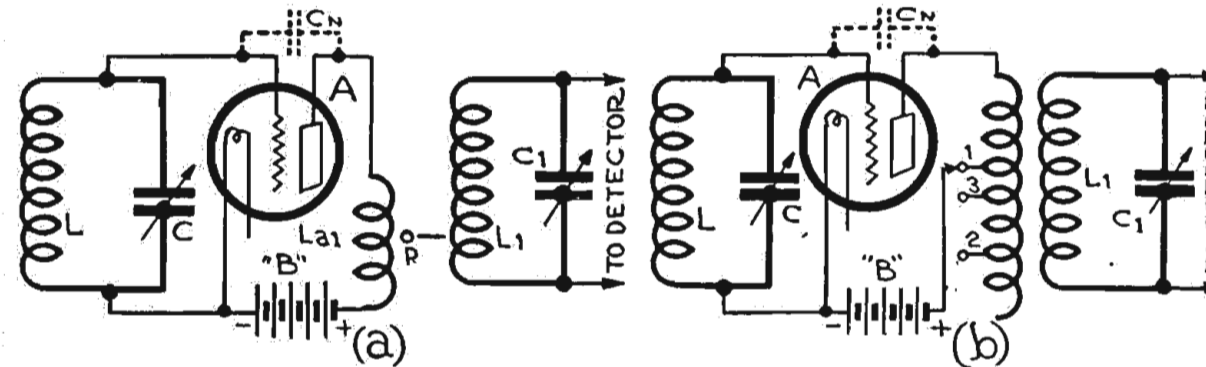


Figure 6

tion as this circuit. The result in these variations in grid potential is the production of identical variations in the unidirectional plate current.

In other words, the signal energy induced into the LC circuit will be repeated

reasonably accurate to assume that the high frequency pulsations in the unidirectional plate current, resulting from the oscillating energy in circuit LC, will fail to excite by self-induction alternating current of appreciable amplitude in La1.

Disregarding L1C1, it is then obvious that the alternating component of the plate current will be exceedingly small in magnitude and the reaction current (regeneration) through the natural tube capacity will be negligible.

In the circuit under study, however, the tuned circuit L1C1 is coupled to La1 and the condition of approximate non-regeneration exemplified above does not hold. Suppose the circuit LC is tuned to a 300-meter wave being emitted by a transmitter. The result would be the production of high frequency pulsations, due to its low resistance, alternating potentials of considerable magnitude will be created. The electromagnetic field existing by reason of this oscillating energy in L1 will rise and fall through the primary coil La1 which causes the generation of alternating current in the plate circuit. This current is in phase and will combine with the small alternating component of the plate current which is present due to self-induction and the total alternating current will actuate the tube capacity Cn, giving rise to regeneration of the circuit LC. Hence, we see that the regeneration really starts because of the mutual relationship between La1 and L1.

Presence of Regeneration

For a simple explanation for the presence of regeneration in a circuit as shown in the figure 5, we might say that the tuned circuit L1C1, due to its coupling to La1, also serves to tune the plate circuit, of which La1 is a part. The condition is then analogous to the simple receiver described in the preceding article where regeneration occurred due to the electrostatic coupling when the plate circuit was tuned by a variometer.

A multitude of factors enter at this point which have an important bearing on the regeneration. By redrawing the circuit of Figure 5 so as to embrace only those parts which we are interested in, these factors may be more clearly described. (Continued on page 10)



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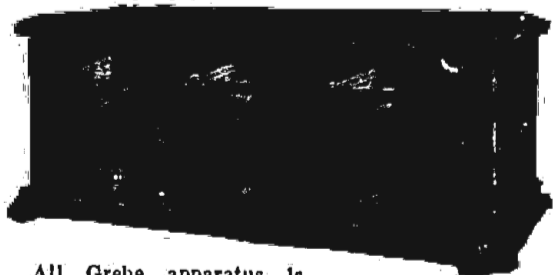
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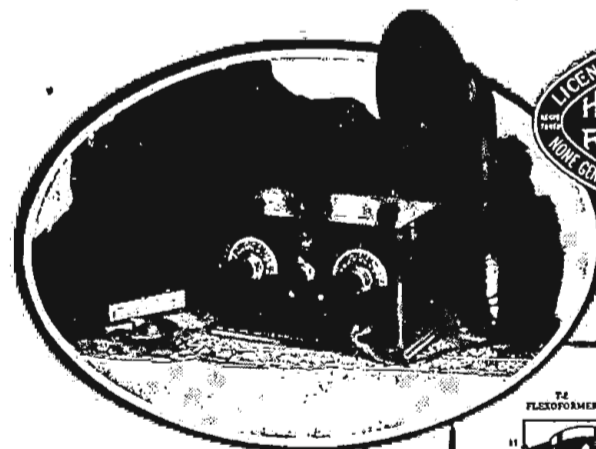
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SELECTIVITY SECRETS

(Continued from page 9)

Figure 6a is a simplified sketch of the fundamental circuits of the regenerative amplifier A of Figure 5. The circuit L1C1 is pictured as being separated some distance from the plate coil La1, indicating a loose coupling (less than critical). It will be clear, when LC and L1C1 are tuned to the same frequency, the amplitude of the alternating current excited in La1 by the field of L1 will increase as L1C1 is moved in the direction of the arrow, so as to approach La1. The latter is equivalent to increasing the coupling between La1 and L1.

As this coupling is increased the reaction current (regeneration) through Cn is also increased resulting in the reduction of the resistance of the circuit LC. At some point P the reaction current will have become so excessive that the resistance of the circuit LC will be reduced to zero and the amplifier A will sustain an oscillation. This is an undesirable condition for telephonic reception, and as mentioned in the first article, it is always necessary to operate at the locus of critical regeneration just ahead of this point, where no oscillations are sustained.

Two Tuning Controls

The circuit of Figure 5 with the two tuning controls, C and C1, adding a variable coupling between La1 and L1 (the latter might be equivalent to the "tickler" control), constitutes a new form of regenerative circuit which has greater selectivity than the older types. A distinct advance has therefore been made in this comparatively recent application of regeneration to coupled amplifier circuits.

It is undesirable in practice to have a variable coupling between La1 and L1, and by reference to Figure 6b a method is suggested by which this variable coupling may be dispensed with. If L1C1 is permanently arranged so as to be in close proximity to La1 we obviously find that the amplifier A will oscillate vigorously over the entire condenser scale.

In arranging La1 so that the number of turns may be varied it will be found that when LC and L1C1 are at resonance at the shortest wave length possible on the condenser scale, the oscillations may be stopped by reducing the number of turns of La1 to some value as indicated at point 2. This is the locus of critical regeneration in respect to the inductive value of La1. Retaining this tap on La1 at point 1, in tuning LC and L1C1 to

resonance at the maximum wave length, it will be observed that the condition of critical regeneration does not hold. In order to bring the amplifier back to this state it is necessary to move the tap on La1 to some other point, such as 2. We now have critical regeneration at the maximum wave length setting.

It is obvious that the regeneration decreases with increase in wave length.

Maximum Regeneration State

This follows from the decrement increase and voltage drop caused across L1 by the shunt condenser C1 when the circuit is tuned to the higher wave lengths. The same conditions in the LC circuit further increase the magnitude of the effect. These factors cause a decreased amplitude in the potentials induced into La1, necessitating a greater coupling to attain the maximum regenerative state. Obviously this discrepancy may be materially improved by using as large a coil and small a condenser as possible. There is a limit to these proportions, however, since the wave length range which can be covered decreases with the decrease in maximum capacity of the tuning condenser. The distributed capacity of the coil is also a limiting factor. With the proper coils, condensers with maximum capacities as low as 225 microfarads may be used.

Having substituted large coils for L and L1 and small condensers for C and C1, it will only be necessary to move the tap on coil La1 from point 1 to 3 to insure the maximum regenerative condition as the circuits are tuned from the lowest to the highest wave length. In many cases this difference may be neglected and the drop from critical regeneration at the high wave length may be so small as to be inappreciable as regards the total results.

In the cases cited, it is important to note that the electromagnetic coupling between La1 and L1 should satisfy the condition necessary for both critical regeneration and critical coupling. If, to attain critical regeneration, we must exceed the critical coupling value between La1 and L1, the selectivity of the second tuning circuit will be impaired. Careful design will make this impossible.

Conclusion

From the foregoing it is apparent that in our circuit developments we are, approaching a state of almost constant and automatically limited regeneration. Such a condition is highly desirable. The design of efficient receivers of this type is

unfortunately difficult, and the demands of selectivity necessitate even greater complications than thus far have been described.

(The next article will tell of the influence of resistance and physical arrangement of parts on selective tuning circuits.—Editor's Note.)

WLW WILL AIRPHONE JOHN W. DAVIS SPEECH

Disregard Silent Night at Request of Radiophans

CINCINNATI—When John W. Davis, Democratic candidate for president, speaks from the Music Hall here, his address will be Radiocast by the Crosley Radio corporation Station WLW.

Although October 24 is a silent night it will be disregarded at the request of the public who have shown great interest in hearing Mr. Davis talk.

Special telephone wires from the Hall to the broadcasting studio will be used.

With the introductory speeches and music it is expected that the program will be of great interest to listeners in all parts of the country.

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CHICAGO.—Twilight musicales were again put on the air at Station WEBH, the Edgewater Beach hotel, marking the beginning of a new season of one of the most popular features.

This early evening program attained so much acclaim last year that it was placed on as one of the regulars. It differs from the ordinary program in that it is composed of artists and soloists, seldom, if ever heard over the Radio.

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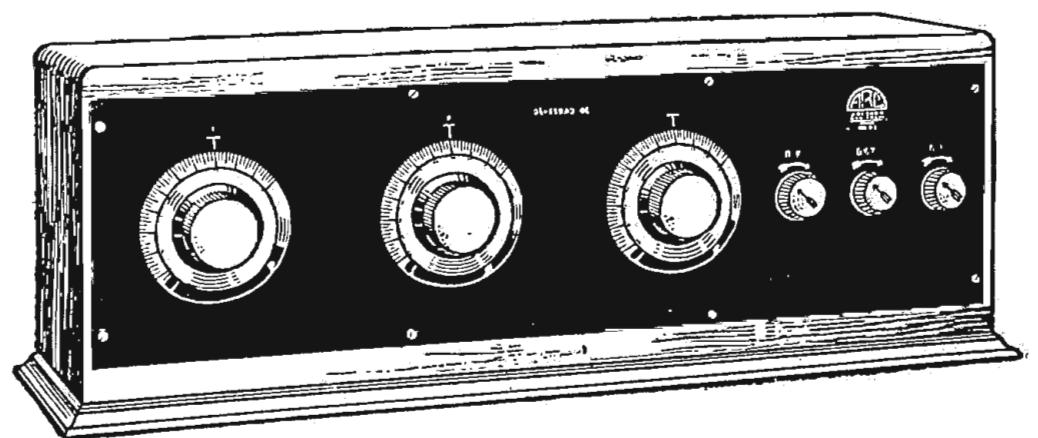
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SCREEN STARS AT KFI THURSDAY NIGHT

Wednesday, October 22

Silent night for: CKAC, WFAA, WFI, WGY, WOAW, WRC, WSAI.

CHYC, Montreal, Can. (Eastern, 341), 7-8:45 p. m., church service, American Presbyterian church.

CKAC, Montreal, Can. (Eastern, 425), 1:45 p. m., Mount Royal hotel luncheon concert.

CNMR, Montreal, Can. (Eastern, 341), 8 p. m., Vander Haeghe (trio); Frances James, soprano; Mildred Page, reader; "Forests as a Basis of National Development," Elwood Wilson.

KDKA, E. Pittsburgh, Pa. (Eastern, 326), 7:30 a. m., free hand calisthenics, O. Shannon; 12:15 p. m., Daugherty's orchestra; 6:30, Gregorio Scalzo's orchestra; 7:15, Radio symphony; 7:30, talk, American Red Cross; 8:15, "The Role of Chemistry in Everyday Life," C. G. King; 8:30, "Another Air Cooled Program."

KFAE, Pullman, Wash. (Pacific, 330), 7:30 p. m., Scotch songs and readings, Janet Roe; Mary Elizabeth Turner, pianist; "Continuous Cow Testing," Don G. Magruder; "Value of Bacteriology in Certain Farm By-Products," S. C. Vandecavey; readings.

KFI, Los Angeles, Calif. (Pacific, 469), 5:30-6 p. m., Examiner news bulletin, Dr. Ralph L. Powers; 6:45-7:30, Nick Harris detective stories; orchestra; 7:30-8, Sigma Pi violin trio; 8-9, Evening Herald concert; 9-10, Examiner studio program; 10-11, special dramatic program; 11-12, Ambassador hotel Coconut Grove orchestra.

KFKB, Milford, Kas. (Central, 286), 8-9 p. m., Abe Martin's band; 9-10, lecture, Dr. Osborn; male quartet; 10-11, lecture, Dr. Brinkley; Jubilee boys orchestra.

KFNH, Shenandoah, Ia. (Central, 266), 7:30 p. m., Shurgeon Mercantile company.

KFOA, Seattle, Wash. (Pacific, 455), 12:30-1:30 p. m., noonday luncheon program, Seattle Rotary club; 8:30-9, Mary Fistonich, contralto; 9-9:45, Earl Gray's band.

KFSG, Los Angeles, Calif. (Pacific, 278), 2:30-4:30 p. m., divine healing service; testimonials; "Jesus Christ, the Same Yesterday, Today and Forever," Aimee Semple McPherson; ladies' revival chorus; Florence Glauser, soprano; Ruth Frances Thomas, pianist; Esther Fricke Green, organist; 6:30-7:30, Gray studio children's program, Mrs. Edward Hughes and daughters, Mary Elizabeth and Helen, in nature study continuity.

KGO, Oakland, Calif. (Pacific, 312), 4-5:30 p. m., concert orchestra, Hotel St. Francis.

KGW, Portland, Ore. (Pacific, 492), 12:30 p. m., concert, Bill Darby's orchestra; 5, children's program, story by Aunt Nell; 8, Kiwanis quartet; 9, "The Value of Radio," Daniel Nelson Clark; 10, dance music, George Olsen's Metropolitan orchestra; Mildred Nichols, violinist.

KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., concert; garden talk, Fred C. McNabb, of Agger & Musser Seed company; 2:30-3:30, matinee music; 6-6:30, Art Hickman's concert orchestra; 6:30-7:30, children's hour, "American History," Prof. Walter Sylvester Herzog; "Dick Winslow, screen juvenile and reporter," Muriel MacCormac, screen juvenile; bedtime story, Uncle John; 8-10, lecture, Dr. M. E. Baumgardt; concert, courtesy, Redlands Chamber of commerce; Mr. A. E. Isham, secretary; 10-11, Art Hickman's dance orchestra.

KOB, State College, N. M. (Mountain, 360), 7:30-8:30 p. m., "Results of the New Mexico State Club Demonstration Contest," W. L. Elser; "Range Management, II," Prof. John Lantow; "Needed Food Legislation," Prof. H. W. Titus.

KPD, San Francisco, Calif. (Pacific, 423), 1-2 p. m., Rudy Selger's Fairmont hotel orchestra; 4:30-5:30,

Headliners of the Week

STAMP collectors will enjoy the talk given by H. A. Diamant Wednesday night. Mr. Diamant is a stamp expert and will probably be glad to answer questions about your private collections. Mayor Curley of Boston will also be on the air most of the week at WEEI.

Out where the supply of motion picture stars is hard to exhaust, Los Angeles, KFI will put on a movie night Thursday when all the pretty stars of the Van Pelt Wilson productions will be heard over the ether. Tune in and see whether you can tell they are pretty girls. To turn to politics, Coolidge is the enigma of the voting public. What is "Silent Cal" thinking about? Jonathan A. Rawson will help you to answer this question, if you listen to his talk, "Coolidge Closeups," at WFI.

Dr. George Weider Spohn, head of the Department of English at St. Olaf college, who gave book talks

from WCAL all last year, is on the air again this fall. Tune in Friday for his remarks on the new scientific books of the year.

The air will be full of gay music Saturday. Sometime ago WIP produced "In a Persian Garden" with such success that this opera will be given again this evening. The jolly light opera "Mikado" will delight the listeners-in of WJZ.

Wilda Wilson Church is the English language doctor of KGO, Oakland. Perhaps if you tune in Monday nights, those cross-word puzzles will solve themselves more easily.

If you do not mind discussing your love affairs with half a million or more listening in, write to WOAW, Omaha, about your broken heart. Then tune in for this station at 6 p. m. Tuesday and hear the solution of your problem as given by Cynthia Grey, who will give "Advice to the Lovelorn."

WFI, Philadelphia, Pa. (Eastern, 395), 1 p. m., Meyer Davis Bellevue Stratford concert orchestra; 5, Loretta Kerk, pianist; closing prices, Chicago grain market; 6:30, Meyer Davis Bellevue Stratford concert orchestra; 7, Sunny Jim, the kiddies' pal.

WGN, Chicago, Ill. (Central, 370), 1:40 p. m., luncheon concert, Drake Concert ensemble, Blackstone string quartet; 2:30, Lyon & Healy artist series; 3-4, rocking chair time; 5:30, Skeezix time; 6-6:30, studio program; 6:30-7, 8-8:30, dinner concert, Drake Concert ensemble, Blackstone string quartet; 8:30-9, Joseph Mertz, tenor; Bessie Ryan, soprano; John P. O'Mears, tenor; 10-11, Jack Chapman Drake dance orchestra.

WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1 p. m., George Albert Bouchard, organist; 2:30, Radio Dealers program; 6:30, dinner music; 8:15, Malle and Little, songsters; 8:50, address, "Esperanto," D. E. Parrish; 9-11, popular musical program, Bishop-Hoerber Publishing company; 11, supper-dance music, Vincent Lopez Hotel Staller orchestra; Harold Gieser, director.

WGY, Schenectady, N. Y. (Eastern, 380), 7:45 p. m., book talk, William P. Jacob; 8, program; 11:30, Stephen Bolesclak.

WHAA, Iowa City, Ia. (Central, 484), 8-9:30 p. m., assembly program for high schools; 12:30-1 p. m., "Domestic Mythology," Prof. C. W. Hart.

WHAS, Louisville, Ky. (Central, 400), 4-5 p. m., selections, Alamo theater orchestra; "Just Among Home Folks"; readings, selected, Courier-Journal and Times editorials; 7:30-9, K. & I. Terminal Railroad orchestra, J. Clark Martin, director.

WHB, Kansas City, Mo. (Central, 411), 2-3 p. m., ladies' hour program, Sweeney Radio trio; 7-8, "Monumental Effect on Landscape," C. L. Van Nostrand; music, Sweeney Radio trio.

WHK, Cleveland, Ohio (Eastern, 283), 6 p. m., Ponce De Leon orchestra, Herbert Hayward, director, Grebe's Hanna restaurant; sports, current news.

WHN, New York, N. Y. (Eastern, 360), 2:15-2:30 p. m., Jimmy Clarke and his entertainers; 2:30-3, Original Kansas City Five, courtesy, Harry Moss; 3-3:30, Fenton Sisters, songs; 3:45-4, "Peeps at Celebrities,"



Mrs. Clara E. Breaker will be the New York university lecturer appearing this week at WJZ, New York. Her subject will be "Co-operative Economics." Dr. William M. Anderson, Jr. (right), broadcasts his sermon every Sunday morning from WFAA, Dallas. He is pastor of the First Presbyterian Church.

Betty Ross; 4-4:30, Samuel Shankman, pianist; 4:30-4:45, "Americanism," May M. Gooderson; 4:45-5, Metropolitan trio; 5-6, John DeDroit and his New Orleans orchestra; 6:30-7, dinner music, Alamo hotel; 7-7:30, Huston Ray's Alamo orchestra; 7:30-7:45, chats with Therese Kay of Emily Shops; 7:45-8, Samuel Polonsky, violinist; Louis Sugaman, pianist; 8:10-8:30, "Parents and Children," Dr. David deSola Pool, Spanish-Portuguese synagogue; 8:30-8:50, Cantor Noah Levine; 8:50-8:55, Jessie Darvall, soprano; 8:55-9, boys' period, Kiwanis club, Wm. J. Stuart; 9:15-9:30, Kathleen J. Burke, contralto; 9:30-9:37, Evening Bulletin current news; 9:37-9:45, Fitzpatrick brothers; 9:45-10, Leo Wood's Air trouper; 10-11, Clover Gardens orchestra.

WHO, Des Moines, Ia. (Central, 526), 7:30-9 p. m., Bankers Life Radio orchestra, W. L. Marsh, director; Irene Benson, contralto; Bernard Thompson, tenor; Holson Matthews, accompanist; "Movie Chats," Dorothy Day.

WIF, Philadelphia, Pa. (Eastern, 509), 1 p. m., Gimbel tea room orchestra; 5, vocal, artist pupils of Montreal Vocal studios; Mary E. Steedle, lyric soprano; Mary C. Connelly, mezzo soprano; John Ambrosi, tenor; John Bolandi, baritone; soprano solos, Mary Steedle; tenor solos, John Ambrosi; soprano solos, Mary E. Connelly; baritone and tenor duet from "La Forza del Destino," John Bolandi and John Ambrosi; 1, Theodore Liedemelt, violinist; Walter Kruger, pianist; Charles G. Duves; 6:05, Walter Schwartz and his Venetian cafe orchestra; 7, Uncle Wip's bedtime stories.

WJZ, New York, N. Y. (Eastern, 455), 10 a. m., housewives league men, Mrs. Julian Heath; 10:20, "Household Equipment," Ethel R. Peyer; 10:30, talk, Henry St. Visiting Nurse service; 10:40, Tribune institute, Bertha Baldwin; 10:50, luncheon talk, Eleanor Gunn; 12:30 p. m., "The Importance of Anglo-American Friendship," Sir Esme Howard; 1:15, Orlando's Hotel Roosevelt orchestra; 2:30, the Ambassadors; 4:30, Hotel Belmont tea orchestra; 7, Irving Seiber's Cafe Boulevard orchestra; 8, Wall Street Journal review; 8:10, "Co-operative Economics," Mrs. Clara E. Breaker; 8:30, harmony songs, Hoek and Jerome; 8:45, "Air Mail Service," Col. Paul Henderson; 9:10, Davlowa Ballet music, Manhattan Opera house; 10:30, Billy Wynne's Greenwich Village Inn orchestra.

WKAQ, San Juan, P. R. (Central, 360), 6-10 p. m., Municipal band.

WLS, Chicago, Ill. (Central, 345), 12-1 p. m., Sears-Roebuck Four Humming birds; "What I Am Trying to Do in Solving My Marketing Problem," W. J. Dougan; 3:45-4:15, "Dressing Hints," Ellen Rose Dicks; "Ballroom Party Suggestions," Julia Deal; Ralph Emerson, organist; 6:45, Ford Rush, Glenn Rowell; 6:50, Ralph Emerson organist; 7, lullaby time, Glenn Rowell and Ford Rush; 7:20, Sears-Roebuck Four Aces of harmony; 7:30, Isham Jones and his Colleen Inn orchestra; 7:45, Sears-Roebuck Four Aces of harmony; 8-9, "What I Am Trying to Do to Solve the Farm Labor Problem," W. J. Dougan; (Continued on page 12)



Esther Hyatt Villalon (left), well-known Philadelphia soprano, will give another program this week, October 27, at WDAE. This will be in answer to the many requests for her appearance.



Rudy Seiger's Fairmont hotel orchestra; 5:30-6:30, children's hour stories, Big Brother of KPO; 7-7:30, Rudy Seiger's Fairmont hotel orchestra; 8-11, E. Max Bradford's Versatile band; lesson in conversational French, Edna K. Barker, director; Marie L. Buntin, instructor; Eleanor Stedinger, soprano; Mrs. Clyde White, accompanist; banjo duets, Frank Moore, Charles Payne.

KSD, St. Louis, Mo. (Central, 546), 6:15 p. m., Albergh's concert ensemble, Arne Arnesen, violinist; 9, "Stamps," H. A. Diamant.

KYW, Chicago, Ill. (Central, 536), 6:30 a. m., morning exercises, Y. M. C. A.; 11:25, table talk, Mrs. Anna J. Peterson; 6:30-7, children's bedtime story, Uncle Bob; 7-7:30, dinner concert, Joska de Babary's orchestra, Coon-Sanders; "Original Nighthawks," 7:30-8, program, Duncan Sisters Music Publishing company; 8-8:30, program, Radio Age; 8:30-8:45, "Around the Town" with KYW in Chicago; 8:45-9:05, Radio Age; 9:05, "Good Roads," talk, Chicago Motor club; 9:15, talk, DeWitt C. King; 9:45-12:30, midnight revue, Coon-Sanders; "Original Nighthawks," 12:50, W. Remington Welch, organist.

WBAP, Fort Worth, Tex. (Central, 476), 7:30-8:30 p. m., Ford quartet; 9:30-10:15, popular dance music, Texas hotel orchestra.

WBAV, Columbus, Ohio (Eastern, 423), 12 m., The Linsch Owens, banjo.

WBB, New York, N. Y. (Eastern, 273), 8 p. m., instrumental selections; 8:10, Isabella Sternthal, soprano; 8:20, Bible lecture; 8:30, Isabella Sternthal; 8:50, instrumental selections.

WBZ, Springfield, Mass. (Eastern, 337), 6 p. m., dinner concert, Westinghouse Philharmonic trio; 7:05, information concerning civil service examinations; 7:30, bedtime story for the kiddies; 7:40, Westinghouse Philharmonic trio; William S. Tilton, baritone; Ruby

Tilton Kingsly, accompanist; 8:15, James D. Moynihan, whistler; John S. O'Donnell, accompanist; 9, Florence Haggart, soprano; 9:30, P. Harold Morrison, baritone; Helen Morrison Dunlap, accompanist; 10, musicale; 11, Leo Reisman and his Hotel Brunswick orchestra; 11:30, songs, Bill Cole, Jack Armstrong; 12, Leo Reisman and his Hotel Brunswick orchestra.

WCAE, Pittsburgh, Pa. (Eastern, 462), 3 p. m., Fred Rosenthal, pianist; 6:30, dinner concert, William Penn hotel; 7:30, Sunshine Girl; 7:45, special feature; 8:15, special feature; 8:30, musical program.

WCAL, Northfield, Minn. (Central, 360), 9:45 a. m., Olaf college chapel service.

WCAY, Milwaukee, Wis. (Central, 266), 6:30 p. m., Opera Store night; Howard's orchestra; Badger Opera quartet; Jerome Treis, cornetist; Mrs. Bauminger, soprano; Tony Wuchterl, reader.

WCX, Detroit, Mich. (Eastern, 517), 4:15 p. m., musical program; 6, dinner concert; 7, musical program.

WDAF, Kansas City, Mo. (Central, 411), 3:30-4:30 p. m., the Star's string trio; 6-7, school of the air, piano tuning-in number on the Duo-Art; address, auspices, Health Conservation association; address, representative of the Meat Council of Greater Kansas City; the Tell-Me-a-Story lady; music, Hotel Muehlebach Triumphant ensemble; 8-9:15, program, string instrument pupils of Anton Seuffert; 11:45-1 a. m., Nighthawk frolic, the "Merry Old Chief" and the Plantation players.

WDAR, Philadelphia, Pa. (Eastern, 395), 11:45 a. m., daily almanac; 12:02 p. m., organ recital, Stanley theater; Arcadia cafe concert orchestra; sermon, auspices of Philadelphia Federation of Churches; 2, Arcadia cafe concert orchestra; "Care of Children," Mrs. Louis Love; Edna Finestone, pianist; 7:30, Dream Daddy's bedtime stories; 8, Arnold Abbott's "Conversation Corner"; 8:15, dance music from Green

Hills Farm orchestra, direction Herman Kentner; 10, Arcadia cafe dance orchestra.

WEAF, New York, N. Y. (Eastern, 492), 11-12 a. m., young mother's program; 12:12-20 p. m., chapel services, Columbia university, address, Chaplain Raymond Knox; organ music, Walter Henry Hall; male chorus; 4-4:15, Bertha Bedell, soprano; 4:15-4:30, story telling, Hester Conway, New York Public Library; 4:35-5:30, children's week program; 6-7, dinner music, Waldorf-Astoria hotel; 7-7:30, services, United Synagogue of America; 7:30-7:45, 19th Kosanoff, cellist; 7:45-8, talk, American agriculturist; 8-9, lecture-recital, Louise Stallings, mezzo-soprano and May Laird Brown; 9-9:45, Phoenix Male quartette; 9:45-10:30, Yans Hawaiian ensemble.

WEAO, Columbus, Ohio (Eastern, 360), 9 a. m., music, Marguerite Manley Siedel School of music talent; 11 a. m., music, Siedel artists; 1:30 p. m., music, Siedel artists.

WEBH, Chicago, Ill. (Central, 370), 7 p. m., Edgewater Beach Oriole orchestra; Constant Sigris, dramatic tenor; Mue. Hibbard, soloist; musical bits, Balaban & Katz Riviera theater; 9-10, Edgewater Beach Oriole orchestra; Marie Kelly, reader; musical bits, Balaban & Katz Riviera theater; Langdon Brothers, Hawaiian guitarists; 11-12, Edgewater Beach Oriole orchestra; Nick Lucas, soloist; Marie Kelly, reader; Langdon brothers, Hawaiian guitarists.

WEEI, Boston, Mass. (Eastern, 306), 7 p. m., talk, Mayor Curley of Boston; 7:10, Big Brother club; 7:10, Elmer Orne, pianist; 8, "Money in Onions," Dorothy H. Goodwin; 8:15, Levithan string orchestra; 9, concert, Madame Alice Faschi, operatic contralto; 10, musicale; 11, dance music, Dok-Elzenbourg and his Sinfonians.

WFAA, Dallas, Tex. (Central, 476), 12:30-1 p. m., music, Dallas theater.

MAYOR OF BOSTON TO TALK AT WE

Where to Hear Concerts

Central Standard Time

THESE are the stations for music lovers to dial, and you can hear, providing you dial correctly and read the programs carefully, everything from jazz to opera.

Wednesday: 6, WKAQ, WMAQ, WCN, WGN; 6:30, WCA, WEAF, WGN, WLS; 6:40, WBZ; 6:45, KSD, WHN; 7, KYW, WBB, WEBB, WTAM; 7:15, WBZ, WGR, WOO, WOR; 7:30, KFNF, WBAP, WCAE, KYW, WEBB, WHAS, WHN, WHO; 7:45, WLS; 8, CNRM, KFKA, KYW, WBZ, WDAF, WEAF, WGR, WOC; 8:30, WBZ, WGN, WMAQ, WOR; 8:45, WEAF; 8:55, WLW; 9, WBZ, WMH; 9:15, WMAQ; 9:30, WFAE, KFI, WOO; 10, KFI, KGW, KPO; 10:15, WLS; 10:30, KFOA, WBZ; 10:40, WLS; 11, KFI; 12, KFI; 12:30, KYW.

Thursday: 6, WCX, WEAF, WGN, WMAQ; 6:30, WLS, WOAW; 6:45, WEAF, WLS, WOAW, WTAY; 7, CKAC, WGY, WHK, WJAX, WJY, WLS; 7:15, WBZ, WIP, WRC; 7:30, KFNF, KDKA, KYW, WBAP, WGY, WFAO, WHAS, WRC; 7:45, WCAE, WEAF, WRC; 8, KFKA, WCB, WBB, WJAX, WMH, WRC; 8:50, WBB; 8:55, WFAA, WGN, WMC, WRC; 8:57, WHN; 9, KFKA, KBZ, WCAL, WOAW; 9:15, KYW, WMAQ; 9:30, KFI, WBAP; 10, KDKA, KGO, WSAI; 10:30, WGY, WLW; 11, KFI, WFAA, WSAI; 11:15, KFSG; 11:30, WEBB; 12, KFI, KFSG.

Friday: 6, WCX, WGN, WMAQ; 6:30, WEAF, WLS, WOAW; 6:45, WTAY; 7, CNRT, KYW, WBAV, WDAF, WEBB, WHK; 7:15, WEAF; 7:30, KDKA, KFNF, KYW, WBAP, WHAS, WHO, WOO; 8, KFKA, WGR, WCA, WOC; 8:30, WGN; 9, WBZ, WEAF, WHN, WMAQ, WOAW; 9:30,

KFAE, KYW, WBAP, WOO; 9:45, WLS; 10, KFI, WBZ, WEBB, WHN; 10:40, WLS; 11, KFI; 11:15, KFSG; 12, KFI, KFSG, WEBB; 12:30, KYW.

Saturday: 6, WGN, 6:30, CKAC, WEAF, WGN; 6:45, WTAY; 7, WBB, WEBB, WHK, WLS, WRC; 7:10, WHN; 7:15, WOR; 7:45, WBZ; 7:50, WHN; 8, CKAC, KDKA, KFNF, KSD, KYW, WEAF, WHAS; 7:40, WBB; 8, KFKA, KYW, WIP, WMAQ; 8:15, WBZ, WSAI; 8:30, WFAA, WGN, WMC; 8:55, WHN; 9, WMAQ, WOAW, WTAY; 9:15, WSAI; 9:30, KYW; 9:45, WOR; 10, KGO, WEBB, WMH; 11, WAAW; 12, WCAL, WEBB.

Sunday: 6:15, WGR; 6:30, KFNF, WGY, WLS; 7, KYW, WEBB, WLS; 7:30, WHO; 8, WCB, WHK, WJAX; 8:15, WEAF; 8:30, WCAL; 9, KSD, WGN, WHAA, WOAW; 9:30, KFSG, WFAA; 12, KFSG, WBAP.

Monday: 6, WMAQ; 6:30, WOO; 6:45, KSD; 7, WOR, WTAM; 7:15, WEAF, WGR; 7:30, KDKA, WAAW, WBAP, WCX, WHO, WOO, WRC; 8, KFKA, WCA, WCB, WDAF, WHAZ, WLW, WMH; 8:10, WDAF; 9, KSD; 9:30, KFAE, WBAP; 10, KGW; 11:15, WHO; 11:45, WDAF.

Tuesday: 6, WEAF, WGN, WMAQ; 6:30, CKAC, WGN, WJAX; 6:15, WTAY; 7, WBAV, WGY, WJAX, WJY; 7:15, WEBB; 7:30, KDKA, KFNF, WBAP, WHAS, WSAI; 8, KFKA, WHB; 8:15, CKY; 8:30, WGN; 9, KOB, WCX, WOAW; 9:15, WCA, WMAQ; 9:30, KFSG, WBAP; 10, KDKA, KGO, WLW; 10:30, KGW.



Elsie Herkenhoff, violinist with the Lazarus quartet, will play at WEAO, Columbus, Thursday night, October 23

Lennam, reader; 9:15, Joyce Bigelow, violinist; 10, faculty, Turner School of music: Laura S. Jones, violinist; Mary Steele, pianist; Arthur H. Turner, baritone. WCAE, Pittsburgh, Pa. (Eastern, 462), 4:30 p. m., Sunshine Girl; 6:30, dinner concert, William Penn hotel; 7:30, Uncle Kaybee; 7:45, special feature; 8, special feature; 8:15, special feature; 8:30, Moore's Cafeteria weekly radio review, E. T. Moores, Manager.

WCAI, Northfield, Minn. (Central, 360), 9:45 a. m., St. Olaf college chapel service; 9, Bernice Armstrong, soprano; Audrey Armstrong, contralto; O. Matthew Lyders, baritone; Neil Kjos, clarinetist.

WCA, Milwaukee, Wis. (Central, 266), 10:30 p. m., Arcadia ballroom orchestra; Tune Tinkers; Eulalie Pross, mezzo-soprano.

WCOB, Zion, Ill. (Central, 345), 8 p. m., male chorus; Mrs. Inman, soprano; Florence Farrar, contralto; Alexander DePew, flutist.

WCX, Detroit, Mich. (Eastern, 517), 4:15 p. m., musical program; 8, dinner concert; 7, musical program.

WOAF, Kansas City, Mo. (Central, 411), 3:30-4:30 p. m., the Star's string trio; 6-7, school of the air, piano tuning-in number on the Duo-Art; travolegue, Edgar Allen Linton; readings, Miss Cecile Burton; the Tell-My-a-Story lady; music, Hotel Muchelbad, Trianon ensemble; 11:45-1 a. m., Nighthawk frolic, the "Merry Old Chief" and the Plantation players.

WDAF, Philadelphia, Pa. (Eastern, 395), 11:45 a. m., daily almanac; 12:02 p. m., organ recital, Stanley theater; Arcadia cafe concert orchestra, Feri Sarkoz, director; 2, Arcadia cafe concert orchestra; Edna Finesone, pianist; 5, Question Period in series of educational talks, broadcast by faculty of Pierce school; 7:30, Dream Daddy's bedtime stories.

WEAF, New York, N. Y. (Eastern, 492), 11-11:15 a. m., Lee Lannhurst, pianist; 11:15-11:30, "Winter Goodies," Prudence Penny; 11:30-11:45, Helen A. Ballard of Virginia Dare Extract company; 4-4:15 p. m., musical program; 4:15-5, lecture-recital, Mrs. Charlotte Lund; N. Val Peary, pianist; 5-5:30, children's week program; 6-7, dinner music, Waldorf-Astoria hotel; 7:45-8, Metropolitan concert quartette; 7:45-8, Carolyn Finney Springer, contralto; 8-8:15, talk, Bank of America; 8:15-8:45, "Touring with the Packard," George E. Cooley, tour director; 8:45-9:15, Michael Lambert, cellist; Edythe Lambert, soprano; 9:15-10, Albert Wiederhold, pianist; 11-12, Vincent Lopez and his Hotel Pennsylvania orchestra.

WEAO, Columbus, Ohio (Eastern, 360), 9 a. m., music, Marguerite Manley Sidel School of music talent; 11, music, Sidel artists; 1:30 p. m., music, Sidel artists; 8, university chimes; requested songs, Robert Derringer, tenor; piano solos, Annilla Rittman; tenor solos, A. C. Gay; 8:30, concert, Lazarus quartet, Agnes Schlaechter, piano; Laura Lee Thomas, cello; Katherine Zettler, violin; Elsie Herkenhoff, violin.

WEBB, Chicago, Ill. (Central, 370), 7-8 p. m., talk, delegate, United Lutheran church convention; 9-10, Edgewater Beach Orle orchestra; Elizabeth Berry, soprano; musical hits, Riviera theater; Carlo L. Kearns, baritone; 11-12, Edgewater Beach Orle orchestra; Harry Davis, baritone; Nek Lucas; Edgewater Beach trio; Edgewater Beach Hotel late revue.

WEEI, Boston, Mass. (Eastern, 396), 1 p. m., assembly luncheon, Boston Chamber of Commerce; 7, talk, Mayor Connelley; 7:10, Big Brother club; 7:40, J. A. Horner, cornetist; 8, dance music, Herman Covitz and his Adams House orchestra; 9-12, program from WEAF.

WFAA, Dallas, Tex. (Central, 476), 12:30-1 p. m., "Treating Yourself Right," Charles E. Osborne; 8:30-9:30, musicale, auspices of the Wednesday Morning Choral club; 11-12, Dwight Brown, organist.

WFI, Philadelphia, Pa. (Eastern, 395), 1 p. m., Meyer Davis Bellevue Stratford concert orchestra; 3, closing prices, Chicago grain market; 3:05, West Philadelphia Mothers' Club program; Housewives' Radio exchange; 6:30, Meyer Davis Bellevue Stratford concert orchestra; 7, Sunny Jim, the kiddies' pal; 8, "Coolidge Close-ups," Jonathan A. Kavson, Jr.; 9, Radio play, Starlight players.

WGN, Chicago, Ill. (Central, 370), 1:10 p. m., luncheon concert, Drake Concert ensemble, Blackstone string quintet; 3-1, rocking chair time; 5:30, Saxeiz time; 6-6:30, studio program; 6:30-7, 8-8:30, dinner concert, Drake Concert ensemble, Blackstone string quintet; 8:30-9, Chicago quartet, Nell Gwynn, soprano; Blanche Robinson, pianist; 10-11, Jack Chapman Drake dance orchestra.

WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1 p. m., George Albert Bouchard, organist; 2:30, Radio Dealers program; 6, Halcyon string quartet.

WGY, Schenectady, N. Y. (Eastern, 380), 6:30 p. m., dinner music, Trio of Hotel Ten Eyck; 7:15, book talk, William F. Jacob; 8, Polish music, Frank G. Novak and his Albanians; 11:30, Stephen Bolocaj, organist.

WHAA, Iowa City, Ia. (Central, 484), 12:30-1 p. m., "The English Cabinet of Today," Prof. H. G. Plumm.

WHAS, Louisville, Ky. (Central, 400), 4-5 p. m., Alamo theater orchestra; "Just Among Home Folks"; readings, Courier-Journal and Times editorials; 7:30-9, concert, auspices, Helen I. Mitchell; four-minute digest of International Sunday school lesson, Dr. Harris Mallinckrodt, pastor; four-minute welfare talk.

WHB, Kansas City, Mo. (Central, 411), 2-3 p. m., ladies' hour program, Sweeney Radio trio; 8-9, Varied musical program, South Side male quartet; (Harline Maudox, violinist; Cecile Truesdale Hensley, reader; Stella Subrowski Hodgins, soprano; Mrs. E. L. Thrax-

The Gypsy ensemble with WEAF's program evening

The Aristocratic O.K. again

Wednesday, October 22

(Continued from page 11)

"Farm Filchings." E. B. Heaton; 9, poem period, H. D. Sandler feature; 9:25, Dennis Sisters; 9:30, book review; 9:45, Dennis Sisters; 10, Isham Jones and his College Inn orchestra; 10:15, Arthur Knopkins, violinist; 10:30, Isham Jones and his College Inn orchestra; 10:40, Glenn Rowell, Ford Rush.

WLW, Cincinnati, Ohio (Central, 423), 4 p. m., concert for shut-ins; 10 lesson, Fred Smith, instructor; 8, Virginia entertainers; 8:55, piano solos, Marjory Garrigus Smith; 9-10, Fornica band and orchestra, Walter Esberger, director.

WMAQ, Chicago, Ill. (Central, 447.5), 1 p. m., speeches, weekly luncheon of the Association of commerce; 4:10, beauty, talk, Mme. Grabe Earl; 4:30, program, pupils of Cosmopolitan School of music; 6, Chicago theater organ recital; 6:30, stories for children, Georgene Faulkner; 8, weekly lecture, Northwestern university; 8:30, WMAQ play night, William Ziegler Nourse, director; 9:15, Evans Lloyd and "The 4 Voices"; 9:45, talk, Chicago charities.

WMC, Memphis, Tenn. (Central, 500), 12:30 p. m., daily concert, Shrine roof cafe.

WMH, Cincinnati, Ohio (Central 309), 8 p. m., Goodrich Silvertown orchestra; 9, piano solos, Eugene Perazzo; soprano solos, Margaret Kountz; vocal duets, Margaret and Mabel Kountz; violin solos, Helen Kill; 9:15, "Bliss of Cincinnati History," George W. Platt; 10, Auburn's orchestra, Lawrence Aicholtz, director; 12, Peacock Inn midnight frolic.

WOC, Oavenport, Ia. (Central, 484), 12 m., chimes; 7 p. m., sandman's visit; 8, Erwin Swindell, organist; Charles R. Hall, tenor.

WOO, Philadelphia, Pa. (Eastern, 509), 11 a. m., organ recital, Mary E. Vogt; 12:02 p. m., Wanamaker crystal tea room orchestra, Robert E. Golden, director; 5:15, organ recital, Mary E. Vogt; 7:30, A. Candelari and his orchestra from French room, Adelphia hotel; 8:15, hand concert, Robert Curli; Ogden band, J. Lawrence Grinnell, director; 9, WOO orchestra, Robert E. Golden, director; 10:05, organ recital, Mary E. Vogt; 10:20, Vincent Rizzo and his Hotel Sylvania dance orchestra.

WOR, Newark, N. J. (Eastern, 405), 2:30-2:45 p. m., Francis Pehl, pianist; 2:45-3, William Dawson, tenor; 3:15, Francis Pehl; 3:45-3:50, William Dawson; 6:30-7, Gene Ingraham and his Great Notch Inn orchestra; 8-8:15, Gene Ingraham and his Great Notch Inn orchestra; 8:15-8:30, Frank Fowler, bass; 8:45-9, Jap Consul; 9:30-10, recital, Sonya Medvedeff Blinder, soprano, assisted by Diana Kasser, accompanist; 10:45-11, Ben Friedman entertainers.

WRC, Washington, O. C. (Eastern, 469), 3 p. m., fashion developments of the moment, women's wear; 3:10, songs; 3:20, songs; 3:35, Eleanor Glynn, pianist; 3:50, sports for women; 4, songs; 6, stories for children, Peggy Ahlson.

WSAC, Clemson College, S. C. (Eastern, 360), 7 p. m., general farm news; timely hints, Boys' club work; 10-minute talk, seasonal; 10-minute talk, animal husbandry.

WSB, Atlanta, Ga. (Central, 429), 5:30 p. m., bedtime story, Bonnie Barnhardt; 10:15, Fred Hughes, Radlow frolic.

WTAM, Cleveland, Ohio (Eastern, 390), 8 p. m., "Old Favorites Night," arranged by Cleveland Plain Dealer; "Songs of long ago," quartette, Mary E. Kettelman, soprano; Nell Habler Bergerman, contralto; Wilson J. Clark, baritone; Harper Garcia Smyth, baritone; Florence Johnson, pianist; Mrs. Harper Garcia Smyth, hostess; direction of Harper Garcia Smyth.

WTAY, Oak Park, Ill. (Central, 283), 6:45-7:45 p. m., George Clark, organist; 8-8:15, 10:15-11:15, Axel "Irishmen-on, piano duets; ten minute technical talk, Radio Age; Guyon's Paradise ballroom orchestra.

WVI, Detroit, Mich. (Eastern, 517), 8 a. m., setting-up exercises, R. J. Horton; 9:30, talk, women's editor, Detroit News; 12 m., musical program; 3 p. m., Detroit News orchestra; 8:30, Detroit News orchestra; Tappleton Moore, tenor.

Thursday, October 23

Silent night for: KFAE, KGW, KOB, KSO, WDAF, WGR, WHO, WOO.
 CKAC, Montreal, Can. (Eastern, 425), 8 p. m., Basilica choir, Arthur Laurendeau, director; A. Letondal, organist.

KOKA, E. Pittsburgh, Pa. (Eastern, 326), 12:15 p. m., Sealzo's orchestra; 6:30, Victor Saudek's KDKA Little Symphony orchestra; 7:15, Unele Ed will take the Radio children on a trip to Coney Island; 7:30, talk, Automobile club; 8, farm program; 8:30, Victor Saudek's KDKA Little Symphony orchestra; Adele Eggers Furniss, contralto; Albert G. Corless, tenor; Mrs. Grace Evelyn Schaney, accompanist; 11, concert, Pittsburgh Post studio.

KFI, Los Angeles, Calif. (Pacific, 469), 5:30-6 p. m., Examiner news bulletin, Dr. Ralph L. Power; 6:45-7:30, Y. M. C. A., lecture; Bon Ton orchestra; 7:30-8, vocal selections, the Crosby sisters; 8-9, Hotel Ambassador concert orchestra; 9-10, Examiner concert; 10-11, vocal and instrumental recital.

KFKB, Milford, Kan. (Central, 286), 8-9 p. m., Abe Martin's band; 9-10, lecture, Dr. Osborn; male quartet; 10-11, lecture, Dr. Brinkley; Jubilee boys' orchestra.

KFNF, Shenandoah, Ia. (Central, 266), 1:30 p. m., concert from Clearmont, featuring Loah Cheshire, Clement W. Rickman.

KFOA, Seattle, Wash. (Pacific, 455), 8:30 p. m., Seattle Post-Intelligencer program.

KFSG, Los Angeles, Calif. (Pacific, 278), 3:30-4:30 p. m., organ recital, courtesy, B. Earnest Ballard, assisted with Margaret Kennedy, soprano and Harold Lloyd, tenor; 7:30-9:15, auditorium service, exangellible sermon and water baptism; music by choir; hand and organ; 9:15-10, Gray studio concert, courtesy, Butts Music company, Carl Edward Hatch, violinist; Mora Leonard Hatch, pianist, and assisting artists; 10-11, organ hour, courtesy, Esther Fricke Green, at console, Alfred C. Green, tenor; Dr. Joseph Marple, tenor; S. R. Donaldson, trombonist; Tilda Rohr, Swiss contralto.

KGO, Oakland, Calif. (Pacific, 312), 4-5:30 p. m., concert orchestra, Hotel St. Francis; 8, piano duets, Grace Hendricks, Matel Jones; Judith Rensch Scott, soprano; Erwin W. Wentz, cellist; travel talk, "Italy, Switzerland, and the Battlefields," J. E. Barnes; Orley See violin ensemble; Wandzsetta Biers, soprano; 10-1 a. m., dance music, Henry Halstead's orchestra.

KGW, Portland, Ore. (Pacific, 492), 12:30 p. m., Civic Music club; 5, children's program, stories by Uncle Dave, 9 p. m., concert.

KHI, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., Coy Bricklay and orchestra, courtesy, Palace ballroom, Ocean Park; 2:30-3:30, matinee musicale; 6-6:30, Art Hickman's concert orchestra, Edward Fitzpatrick, director; 6:30-7:30, children's hour, "American History," Prof. Walter Sylvester Hertzog; dramatic pupils of Carter Weaver; bedtime story, Uncle John; 7:30, "Art," by Harold Swartz, of Otis Art Institute; 8-10, program, courtesy, Bozzani Motor Car company, arranged by J. Howard Johnson; 10-10:30, concert, presenting Hutch Graham, singer and banjoist; 10:30-11, Art Hickman's dance orchestra, Earl Burnett, director.

KOB, State College, N. M. (Mountain, 360), 7:30-8:30 p. m., College Jazz orchestra; Dr. Asa Brunson, tuberculosis specialist.

KPO, San Francisco, Calif. (Pacific, 423), 1-2 p. m., Rudy Selger's Fairmont hotel orchestra; 4:30-5:30, Rudy Selger's Fairmont hotel orchestra; 5:30-6:30, children's hour stories, Big Brother of KFO; 7-7:30, Rudy Selger's Fairmont hotel orchestra; 8-9, Theodore J. Irvlin, organist; 9-10, family club music and readings; 10-11, E. Max Bradford's Versatile band.

KYW, Chicago, Ill. (Central, 536), 6:30 a. m., morning exercises, Y. M. C. A.; 11:35, table talk, Mrs. Anna J. Peterson; 2:35-1 p. m., afternoon frolic; 6:35-7, children's bedtime story, Unele Bob; 7-7:30, Joska DeLabary's orchestra; Sanders' Original Nighthawks; 8-8:20, Hearst Music company; Madame Dorothy Hatbourn, soprano; Robert Whinnery, baritone; 9:15, safety talk; Z. C. Elkin; 10-11:30, at home program, Count-Sanders' Original Nighthawks.

WAEW, Omaha, Nebr. (Central, 286), 7:30-8:30 p. m., educational program, Rev. E. M. Brown; J. W. Kriss.

WBAP, Fort Worth, Tex. (Central, 476), 7:30-8:30 p. m., concert; 9:30-10:45, program, school of music, Texas Christian university, Prof. H. D. Guelick, director.

WBAV, Columbus, Ohio (Eastern, 423), 12 m., religious service, Columbus Council of churches, Dr. T. W. Fessenden, Franklin Park M. E. church, speaker; sacred music.

WBRR, New York, N. Y. (Eastern, 273), 9:10 p. m., I. B. S. A. trio; 9:20, vocal selections; 9:30, International Sunday school lesson, S. M. Van Sibma; 9:50, vocal selections; 10:05, I. B. S. A. trio.

WBZ, Springfield, Mass. (Eastern, 337), 6:30 p. m., songs, Bill Coty, Jack Armstrong; 7:05, letter from the New England Homestead; "At the Theaters," A. L. S. Wood; 7:30, bedtime story for the kiddies; 7:40, Charles H. Hector with his St. James theater orchestra; 8:15, Priscilla quartet, Eunice B. Truesdale, 2nd soprano; Ruth Sawyer Woodworth, 1st alto; Freida Elsa Heedic, 1st soprano; Edna Grace Merritt, 2nd alto; John Ueiser, accompanist; Mme. Regina Mc-

lor, Mrs. Clyde Cummings, accompanists; 9-10, dance music, Sweeney Radio orchestra.

WHK, Cleveland, Ohio (Eastern, 283), 6 p. m., Ponce de Leon orchestra, Herbert Hayward, director, Grehe's Hanna restaurant; sports, current news; 8 p. m., program arranged by the Cleveland press.

WHN, New York, N. Y. (Eastern 560), 12:30-1 p. m., Chas. Strickland's Palas D'Or orchestra; 2:15-2:30, Mrs. Bob Schaefer, Radio girl; 2:30-3, Original Louisville Jazz band; 3-3:45, Boh Miller and Ira Schusters, songs; 3:45-4, Victor Wilbur, baritone; 4-4:15, Arthur Ball, tenor; 4:15-4:45, Genevieve Williams, soprano; Sam Steinberg, violinist; Charles Strickland, pianist; 4:45-5, "Tea Time Talk," Loretto C. Lynch; 5-6:30, orchestra; 6:30-7, dinner music Alunac hotel; 7-7:30, Huston Ray's Alunac orchestra; 9:30-9:37, Evening Bulletin current news; 9:37-9:50, Sano Mevor, baritone; 9:50-10, Johanna Stern, contralto; 10-10:30, Spear's dance orchestra; 10:30-11, Phil Romano's Roseland dance orchestra; 11-11:15, Richard B. Gilbert and his taro-patch; 11:15-11:30, Cogert's revue; 11:30-12, Lou Gold's orchestra from the Wigwam club; 12-12:30, Ted Lewis and his Symphonic clouds, from the Parody club.

WIP, Philadelphia, Pa. (Eastern, 509), 1 p. m., Gimbel tea room orchestra; 3, recital, students Seterberg School of Music; piano solos, Herman Stein; violin solos, Michael Soranzolo; vocal solos, Florence O'Brien; piano solos, Virginia Himmsherger; 6:05, musical program, direction, Charles Sansone, featuring the Richard brothers; 7, Uncle Wigg's bedtime stories; Mary B. Reeves, Philadelphia Saving Fund society; 8, "Home Lighting for School Children," G. Bertram Regar; 8:15, Philadelphia Police band, direction, Lieutenant Joseph Kiefer; 9:15, talk, Dr. T. C. Beswick; 11:15, Harvey Marburger and his vaudeville orchestra.

WIAX, Cleveland, Ohio (Eastern, 309), 3 p. m., Vinecot Percy, organist; 9 p. m., Ted Robinson, "Philosopher of Folly" of Cleveland Plain Dealer; C. Franklin Morse, tenor; Rex Haller, soprano; Lou Lerner, pianist.

WIY, New York, N. Y. (Eastern, 405), 7:30-8 p. m., Berlitz weekly French lesson; 8-8:15, Josephine Evans, contralto; 8:15-8:30, Time pop question game; 8:30-8:45, Josephine Evans, contralto; 8:45-9, talk, Honorable Augustus Thomas, Democratic National committee; 9-10, Al Helsler's Club Ferrer orchestra; 10-10:15, "Talk on Old Ships," Gordon Grant; 10:15-10:30, John Cassidy, baritone.

WJZ, New York, N. Y. (Eastern, 455), 10 a. m., housewives league menu, Mrs. Julian Health; 10:20, arts and decorations, Mrs. Roberts; 10:30, "Eat and Live Thin," Vance Thompson; 10:40, "Fashions of the Stage," Cora Moore; 10:50, fashion talk, Eleanor Guma; 1 p. m., Nathao Ahas Hotel Pennsylvania orchestra; 3:30, Frank LaGorge, pianist; Edna Baedman, soprano; Madeleine Huilzler, soprano; Grace Dylinc, contralto; 4:30, Bernhard Levitov's Hotel Commodore tea orchestra; 7, Bernhard Levitov's Hotel Commodore dinner concert; 7:55, "Collier's Weekly," John B. Kennedy; 8:10, "Co-operative Economies," Mrs. Clara E. Breakey; 8:30, Anna Pinto, harpist; 9:30, "Football," Big Bill Edwards; 9:15, Wanamaker organ recital; 10:15, Waldorf-Astoria dance orchestra.

WLS, Chicago, Ill. (Central, 345), 12-1 p. m., music numbers, Sweeney Radio orchestra; "How I Am Taking the Gamble Out of Farming," W. J. Dougan; 3:45-4:15, housewives' hour; "From Cook Stove to Casserole," Mrs. Grace Viall Gray; "The Modern Novel vs. the Old Time Story," Mrs. Laura H. Bartholomew; 6:30, Ralph Emerson, organist; 8:15, Our Melody Girls, Bonnet and Irene; 7, lullaby time, Glenn Rowell, Ford Rush; 7:20, "Kalknka," Robert W. Sievers, director, H. D. Sandler feature.

WLW, Cincinnati, Ohio (Central, 423), 4 p. m., French lesson, Madame Telmpidls; piano solo, Adelaide Apfel; 10, message from United States Civil Service Bureau; 10:30, Doherty orchestra; 10:30, Minor instrumental trio; Radario comedy, "The Music Lesson," featuring Senator Schantz; Allnor trio; Doherty orchestra.

WMAQ, Chicago, Ill. (Central, 447.5), 1:10 p. m., household hour, Mrs. Elizabeth O. Hiller, director; 4:30, musical program; 6, Chicago theater organ re-

Station	Time	Program
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WEIGHTY LIGHT OPERA AT WJZ SATURDAY



Mae Dearborn Schwab is one of the popular soloists to be heard regularly when dialing KGW, Portland.

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Where to Hear Talks

Central Standard Time

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

Wednesday: 6, WDAF, WFL, WGY; 6:15, KDKA; 6:30, KDKA, WHN, WMAQ; 6:45, WDAF, WGY; 7, WHB, WBBR, WDR, WOC, WSA; 7:45, WOR; 8, WBBH, WLS, WMAQ; 8:15, KDKA; 8:30, CNRM, KOB; 8:45, KYW; 9, KFKA, KSD, WLS; 9:05, KYW; 9:15, KYW; 9:30, KFKA, WLS, KFSG; 9:45, WMAQ, WMH; 10, KFKA; 11, KGW.

Thursday: 6, WDAF, WGY; 6:05, WBZ; 6:30, KDKA, WBZ, WJY; 6:45, WGY; 7, KGW, WDAF, WEBB, WFL, WIP; 7:45, WJY, 8, KYW, WAAW, WFL, WMAQ; 8:30, WBBR; 9, KFKA, WJY, WMAQ; 9:15, KYW, WJY; 9:30, KFSG; 10, KFKA, WLW, WOAW; 11, KPO.

Friday: 6, WDAF, WDAF, 6:05, WBZ; 6:30, KDKA, WBZ, WEBI; 7, WDR, WHB, WOC; 7:15, WJY; 7:20, WOC; 8, KSD, WEBB, WLS, WLW, WMAQ; 8:15, KDKA; 8:20, KYW;

8:30, KOB, WCAL, WMAQ; 9, KFKA, WLS; 9:30, KFKA; 10, KFKA, KGW.
Saturday: 6, WDAF; 6:30, WBZ, WDR; 6:45, WDAF; 7, KDKA, WIP; 7:10, WBBR; 7:15, WIP; 7:30, WRC; 8, WDAF, WEBB, WFL, WHB, WLS; 8:40, WMAQ; 9, KFKA; 9:05, KYW; 9:30, KFSG; 10, KFKA; 12, WEBB.

Sunday: 6, WFAA; 7, CKY, KDKA; 8, KFKA, WHB; 9, KFKA, WFAA; 9:30, KFKA, WFAA; 9:30, KGO.
Monday: 6, WDAF, WOAW; 6:30, KDKA; 6:45, WDAF; 6:50, WDR; 7, KDKA, WGR, WHB, WRC; 7:30, WFL; 8:30, KOB, WFL; 9, KFKA; 9:30, KFKA; 10, KFKA, KGO.

Tuesday: 6, WDAF, WEBB, WOAW; 6:15, WDR; 6:30, WDR; 6:45, WGY; 6:50, WDR; 7, KDKA, WRC; 7:45, WSAI; 8, WMAQ; 9, KFKA, KSD, WSAI; 10, KFKA, KGW.

L. Zundel; "Factors Determining the Type of Agriculture," F. J. Stevens; book chat, Alice L. Webb.
KFI, Los Angeles, Calif. (Pacific, 469), 5:30-6 p. m., Examiner news bulletins. **Dr. Ralph L. Power; 6:45-8,** Aeolian organ recital; 8-9, Evening Herald program; 9-10, concert, Examiner studio; 10-11, vocal concert; pupils, Myra Belle Vickers; 11-12, Ambassador hotel Cocanut Grove orchestra.
KFKB, Milford, Kan. (Central, 286), 8-9 p. m., Abe Martin's band; 9-10, lecture, Dr. Osborne; male quartet; 10-11, lecture, Dr. Brinkley; Jubilee boys' orchestra.
KFNF, Shenandoah, Va. (Central, 266), 7:30 p. m., concert, Highland Community church, John M. Bixler, director.
KFOA, Seattle, Wash. (Pacific, 453), 12:30-1:30 p. m., noonday luncheon program, members Council of the Seattle Chamber of Commerce; 8:30, Shorty's Melody boys, Gerald Clough, leader.
KFSG, Los Angeles, Calif. (Pacific, 278), 3:30-4:30 p. m., organ recital, Roy Reid Brignall, assisting artists; 7:30-9:15, Crusaders Rally; silver band, G. N. Nichols, director; revival chorus; address, Judge Carlos S. Hardy; evangelistic sermon, Alcee Semple McPherson; 9:15-10, silver band, G. N. Nichols, director; N. E. Brown, Radio engineer; Marjorie Nell Snyder, reader; 10-11, organ recital, B. Earnest Ballard; Margaret Kennedy, soprano; Harold Lloyd, tenor; George Skutskel, Russian basso.

KGO, Oakland, Calif. (Pacific, 312), 4-5:30 p. m., concert orchestra, Hotel St. Francis.
KGW, Portland, Ore. (Pacific, 492), 12:30 p. m., Multnomah Hotel strollers, Dwight Johnson, director; 5, children's program, story by Aunt Nell; 8, popular lecture, University of Oregon; 10:30, Hoot Owl; George Olsen's Hoot Owl orchestra; Pantages theater.
KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., concert, Piggly-Wiggly girls; 2:30-3:30, matinee musicale; 6-6:30, Art Hickman's concert orchestra, Edward Fitzpatrick, director; 6:30-7:30, children's hour, "American History," Prof. Walter Sylvester Hertzog; Sir Richard Hendrick, screen juvenile; bedtime story, Uncle John; 8-10, program presented through courtesy of Mullen & Bluet, arranged by G. Allison Phelps; 10-11, Art Hickman's dance orchestra, Earl Burnett, director.
KPO, San Francisco, Calif. (Pacific, 423), 12:45 p. m., talk, Commonwealth club luncheon; 1-2, Rudy Seiger's Fairmont hotel orchestra; 4:30-5:30, Rudy Seiger's Fairmont hotel orchestra.
KSO, St. Louis, Mo. (Central, 546), 8 p. m., address, Hon. Burton K. Wheeler.
KYW, Chicago, Ill. (Central, 536), 6:30 p. m., morning exercises, Y. M. C. A.; 11:35, table talk, Mrs. A. J. Peterson; 6:45-7 p. m., children's bedtime story, Uncle Bob; 7-7:30, children's bedtime story, Uncle Job; 7:30-8, program, Duncan Sisters Music Publishing company; 8:20-8:45, speeches, auspices of the American Farm Bureau federation; "What the National Boys' and Girls' Club Congress Means to America," G. L. Noble; "Farmers' Produce Markets," A. C. Pace; 9:30-12:30, midnight revue; 12:30, Remington Welch organist.

WBAP, Fort Worth, Tex. (Central, 476), 7:30-8:30 p. m., concert, Osceola quartet; 9:30-10:45, Will Foster, organist.
WBAV, Columbus, Ohio (Eastern, 423), 12 m., Ila Lorbach Owens, pianist; 8 p. m., Ben Bennet, baritone; Schneider's cello quartet.
WBZ, Springfield, Mass. (Eastern, 337), 6 p. m., dinner concert, Westinghouse Philharmonic trio; 7:05, current book review, Court Square Book store; 10, Denway trio, Margaret M. Henry, soprano; Lucy Denneff, violinist; Evelyn Hathaway, pianist; Westinghouse Philharmonic trio; Estrella Richardson, soprano; Mrs. Eleanor Turner LaGazza, accompanist; 11:30, McEntally's singing orchestra.
WCAE, Pittsburgh, Pa. (Eastern, 462), 6:30 p. m., dinner concert, William Penn hotel; 7:30, Uncle Kay-bee; 8, special feature; 8:15, special feature; 8:30, Harmony Boys orchestra.
WCAL, Northfield, Minn. (Central, 360), 9:45 a. m., St. Olaf college chapel service; 8:30, book talk; "Scientific Research and Human Welfare," "The New Dealogue of Science," Dr. George Welda Spohn.
WCAY, Milwaukee, Wis. (Central, 265), 8 p. m., Oswald Jaeger night; Electroworld Dinnerhall, director.
WCK, Detroit, Mich. (Eastern, 517), 4:15 p. m., musical program; 6, dinner concert; 7, musical program.

WDAF, Kansas City, Mo. (Central, 411), 3:30-4:30 p. m., The Star's string trio; 6-7, school of the air, piano tuning number on the Duo-Art; address, auspices, Kansas City children's bureau; the Tell-Me-Story Club; music, Hotel Ambassador; Trianon ensemble; 8-8:30, popular program, Star's Radio orchestra; 11:45-1 a. m., Nighthawk frolle, the "Merry Old Chief" and the Plantation players.
WOAR, Philadelphia, Pa. (Eastern, 395), 11:45 a. m., daily almanac; 12:02 p. m., organ recital, Stanley theater; Arcadia cafe concert orchestra, Feri Sarkozil, director; 2, Arcadia cafe concert orchestra; playlet, members of National School of Elocution and Oratory; 7:30, Dream Daddy's bedtime stories; 8, "Turning the Pages," Arnold Abbot; 8:10, Green Hills Farm Trio; Radio play, WDAK Walter Greenough players; musical selections, direction Mrs. C. M. Maschal; 10:05, Arcadia cafe dance orchestra; meeting of Morning Glory club; songs, Lou Herscher, Carl Zochirn.
WFAF, New York, N. Y. (Eastern, 492), 11-11:30 p. m.,

"A Trip to Athens and the Parthenon," Arthur J. Westermeyer; 11:30-11:50, organ recital, Capitol theater; 4-4:45 p. m., club women's program with music, Catherine R. Reger, soprano; 5-5:30, children's week program; 6-7, dinner music, Waldorf-Astoria hotel; 7-7:30, children's stories, Blanche Eliz, Wade of B. Kinney; Shoe company; 7:30-7:45, Dave Steingart, violinist; 7:45-8, Happiness boys; 8:15-8:45, Anna Glida, soprano, accompanied by Imelde George; 8:45-9, Sigmund Kempner, xylophonist; 9-10, B. Fischer & company Astor Coffee dance orchestra; 10-10:30, Morena Scoville, pianist.
WEAO, Columbus, Ohio (Eastern, 360), 9 a. m., music, Marguerite Manley Sledel School of music talent; 11, music, Sledel artists; 1:30 p. m., music, Sledel artists.
WEBB, Chicago, Ill. (Central, 370), 7 p. m., Edgewater Beach Orlole orchestra; Agatha Karlen, reader; Riviera theater; 9-10, Edgewater Beach Orlole orchestra; Frederick Agard, tenor; Rita McFawn, soprano; 11-12, Edgewater Beach Orlole orchestra; Winter Garden Four; songs, Sandy Meek; Dean Remick, pianist.
WEI, New York, N. Y. (Eastern, 273), 7-7:30 p. m., Hlybrun's review of the new plays on Broadway; 7:30-8:15, J. Vincent Moore and his entertainers; 8:15-9, dance music.
WEEI, Boston, Mass. (Eastern, 306), 7 p. m., talk, Mayor Curley; 7:10, Big Brother club; 7:45, "The Citizens' Committee to Protect Our Homes and Children"; 8, Leon Weltman of the Weltman Conservatory of Music; 8:15, Happy Hawkins and his Grand Gardens orchestra; 8:30, Charles H. Grant, baritone; 8:40, Happy Hawkins and his Grand Gardens orchestra; 9, program from WEAFL; 11, dance music, Dok-Eisenbourg and his Sinfonians.
WFAA, Dallas, Tex. (Central, 476), 12:30-1 p. m., address, Dr. Robert S. Hyver.
WFI, Philadelphia, Pa. (Eastern, 395), 1 p. m., Meyer Davis Bellevue Stratford concert orchestra; 3, closing prices, Chicago grain market; 3:05, composers of Nation program, songs and selections from the Hawaiian; 6:30, Meyer Davis Bellevue Stratford concert orchestra; 7, Sunny Jim, the kiddies' pal.
WGN, Chicago, Ill. (Central, 370), 1:40 p. m., luncheon concert, Drake Concert ensemble, Blackstone string quintet; 3-4, rocking chair time; 5:30, Skeezix time; 6-6:30, studio program; 6:30-7, 8-8:30, dinner concert, Drake Concert ensemble, Blackstone string quintet; 8:30-9, Ballentine Bureau of Music; George D. Horne, baritone; 10-11, Jack Chapman Drake dance orchestra.
WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1 p. m., George Albert Bourardier organist; 2:30, Radio dealers program; 6:30, dinner music; 9-11, concert, Wheat's Ice Cream company; 11, supper-dance music, Vincent Lopez Hotel Statler dance orchestra, Harold Gieser, director.
WGY, Schenectady, N. Y. (Eastern, 380), 8 p. m., drama, "The Bird and the Fish," WGY players; WGY orchestra; 10:30, college night program, dance orchestra and glee club of Union college; "College Athletics," Harold Anson Bruce; "Football, the American College Game," Harold Wittner.
WHAA, Iowa City, Ia. (Central, 484), 12:30-1 p. m., "The Lure of Newspaper Work," Prof. W. S. Maubisby.
WHAS, Louisville, Ky. (Central, 400), 4-5 p. m., Alamo theater orchestra; "Just Among Home Flocks"; readings, selected Courier-Journal and Times editors; 7:30-8, concert, auspices, Mrs. Jane Webster Almyel.
WHB, Kansas City, Mo. (Central, 411), 2-3 p. m., ladies' hour program, Sweeney Radio trio; 7-8, weekly W. C. T. U. talk, Mrs. Fannie L. Taylor; music, Sweeney Radio trio.
WHK, Cleveland, Ohio (Eastern, 283), 6 p. m., Ponce de Leon orchestra, Herbert Hayward, director, Ghebe's Hanna restaurant; sports, current news; 8, concert program.
WHN, New York, N. Y. (Eastern, 360), 2:15-2:30 p. m., Gene Austin, baritone; 2:30-2:45, Judith Roth and Al Wilson; 2:45-3:15, Richard Hitter's Romance orchestra; 3:45-4, Uncle Robert's chat to children; 4-4:15, Mabel Livingston, children's poet; 4:15-4:30, Joseph C. Wolfe, baritone; 4:30-4:45, Madeline Grosz, soprano; 4:45-5, Ivm. J. Stuart, reader; 5-6, Chas. B. Allen and his Chanticleer orchestra; 6:30-7:30, dinner music; Hotel Atlanta orchestra; 9:30-9:37, Evening Bulletin current news; 9:37-10, Dan Gregory's Crystal Palace orchestra; 10-10:15, Myrtle Wagner Whitt, soprano; Bertha L. Rodgers, pianist; 10:15-10:20, songs, Bob Miller; 10:20-10:25, songs, Max Hittler; 10:25-10:30, songs, Ira Schuster; 10:30-11, Fletcher Henderson's Roseland dance orchestra; 11-11:10, Jack Morrisce, tenor; 11:10-11:20, Leonard and Leonard; 11:20-11:30, Rudy O'Flynn, baritone; 11:30-12, Sam Wooding's Club Alabama orchestra; 12-12:30 a. m., Ted Lewis and his Symphonie clowns from the Parody club.

WHO, Des Moines, Ia. (Central, 526), 7:30-9 p. m., Tolbert McEae, baritone; Rosalind Cook, pianist.
WIP, Philadelphia, Pa. (Eastern, 509), 1 p. m., Gimbel tea room orchestra; 3, recital, artists, Frank Oglesby studios, Vida Hoffman, soprano; Marlon Gordon, soprano; Lynore McNulty, mezzo-soprano; Charles Kluge, tenor; Magnus Shilling, bass; Flora Ryan, pianist; 6:35, Jordan-Lewis dance orchestra; 7, Uncle Wip.
WJZ, New York, N. Y. (Eastern, 405), 7:30-8:15 p. m., Billy Wynne's Greenwich Village Inn orchestra; 8:15-8:30, household current topics, William H. Allen; 8:15-9:15, "How Corporate Carelessness Affects the Abscender," Bernard J. McGinn, New York Board of Trade and Transportation; 9:15-9:15, "Income Tax," Frank Shevill; 9:45-10, talk, National Republicmen committee; 10-11, Hotel St. George trio.
WJZ, New York, N. Y. (Eastern, 455), 10 a. m., housewives league menu, Mrs. Julian Death; 10:30, "Be Your Own Decorator," Amy Mall Hicks; 10:30, "Shoppers' Guide," Mrs. Pauline Peck; 10:50, fashion talk, Eleanor Gunn; 1 p. m., Henry Vander Zandon's Hotel Ambassador trio; 3:30, Joseph Knecht's Waldorf-Astoria grill orchestra; 4:30, Hotel Astor organ recital; 7, Savarin ensemble, Nathan Franko, director; 8:10, "Co-operative Economics," Mrs. Clara E. Brookay; 8:30, talk, E. W. Horbert; 9, "By-Ways of

Travel," Wirt W. Barnitz; 9:15, "The Alkado," Brooklyn Light Opera company; 10:30, Duke Yellman's Ireneo Castle orchestra.
WLS, Chicago, Ill. (Central, 345), 12-1 p. m., "What I am Trying to Do in Community Life," W. J. Dougan; 3:45-4:45, "Beauty Hints—Care of the Complexion," Ellen Rose Dickey; "A Trip to London," George H. Conner; 6:30, Ralph Emerson, organist; 6:45, Clara Koertgen; 6:50, Ralph Emerson, organist; 7, lullaby time, Glenn Rowell, Ford Rush; 7:20, Isham Jones and his College Inn orchestra; 7:45, Triple A trio; 7, lullaby time, Glenn Rowell, Ford Rush; 7:15-12, musical review, Ralph Emerson, organist; Harmony girls, Ingram and Carpenter; Walter Peterson, "The Kentucky Wonderbean"; Isham Jones and his College Inn orchestra; Ford Rush, Glenn Rowell.
WLW, Cincinnati, Ohio (Central, 423), 8 p. m., address, John W. Davis, presidential candidate.
WMAQ, Chicago, Ill. (Central, 447.5), 4:10 p. m., "English as She Is Spoken," Mrs. J. Elliott Jenkins; 4:30, program, Rush Conservatory of music, Chicago theater organ; 6:30, Hotel LaSalle orchestra; 8, weekly wide-awake club program, Mrs. Frances M. Ford; 8:30, musical geography, Mrs. Marx E. Oberndorfer, Marx Oberndorfer; 9, program, Ottawa, Iowa.
WMC, Memphis, Tenn. (Central, 500), 12:30 p. m., noon-day concert, Shrine roof garden; 8:30, program, Brilling's Cafeteria orchestra; 11, midnight frolic.
WOAW, Omaha, Neb. (Central, 526), 6 p. m., story hour conducted by Doris Claire Seord; 6:30, Creston, Iowa; 9, Creston, Iowa.
WOC, Davenport, Ia. (Central, 484), 12 m., chimes; 7 p. m., sandman's visit, Val McLaughlin; 7:20, "The Serving of Hot Lunchees in the Rural Schools," Mrs. Richard Schmidt; 8, old-time music, James Simpson.
WOO, Philadelphia, Pa. (Eastern, 509), 11 a. m., organ recital, Mary E. Vogt; 12:02 p. m., Wvanamaker crystal tea room orchestra, Robert E. Golden, director; 5:15, organ recital, Mary E. Vogt; 7:30, A. Candelari and his orchestra from French Room, Hotel Adelpia; 8:30, Erno Rapee's intimate concert from Fox theater; 10:03, organ recital, Mary E. Vogt; 10:30, Vincent Rizzo and his Hotel Sylvania dance orchestra.
WOR, Newark, N. J. (Eastern, 405), 2:30-2:45 p. m., Celia Newmark, soprano; 3:45-3:15, Bob Schafer; 3:15-3:30, Celia Newmark; 6:15-6:30, Vincent Buono, cornetist; 6:30-7, man in the moon stories; 7-7:15, Vincent Buono.
WRC, Washington, D. C. (Eastern, 469), 3 p. m., fashion developments of the moment, women's wear; 3:10, Arthur McCormick, baritone; 3:20, "Beauty and Personality," Elsie Pierre; 3:25, current topics, editor of the Review of Reviews; 3:35, piano recital; 3:50, Magazine of Wall Street; 4, song recital; 6, stories for children, Peggy Albion.
WSB, Atlanta, Ga. (Central, 429), 8-9 p. m., J. P. M. minstrel, Ted Hawkins, Riley Puckett; 10:45, Georgia Railway and Power company quartet.
WTAY, Oak Park, Ill. (Central, 283), 6:45-7:45 p. m., melody night; Glenn Bruce, dramatic reader; Sandy Meek, baritone; Black Cat orchestra.
WJL, Detroit, Mich. (Eastern, 517), 8 a. m., setting-up exercises, R. J. Horton; 9:30, talk, women's editor, Detroit News; 12 m., musical program; 3 p. m., Detroit News orchestra; 8:30, Detroit News orchestra; Claudine Secor, soprano.

Saturday, October 25

Silent night for: KFAE, KFOA, KOB, WBAP, WCAY, WCX, WDR, WGR, WHO, WJY, WLW, WOO, WJL.
CAC, Montreal, Can. (Eastern, 425), 7 p. m., kiddies' stories in French and English; 7:30, Rex Battle and his Mount Royal hotel concert orchestra; Napoleon Dansecan, cellist; 8:30, vocal and instrumental concert, auspices of, "La Lyre," Mrs. J. A. Larriere; Mrs. E. Gareau, E. DeBuller, Gaston St. Jacques; 10:30, Joseph C. Smith and his Mount Royal hotel dance orchestra; Joseph C. Smith, violinist.
KDKA, E. Pittsburgh, Pa. (Eastern, 326), 1:30 p. m., Daugherty's orchestra; 3, Pitt-Tech football game; 6:30, Westinghouse band; 7:15, Richard the Riddler; 7:30, sport review, James J. Long; 7:45, World's Uniform Sunday school lessons, Carman C. Johnson; 8, "Inside Movie Gossip," Sam Comly; 8:15, feature; 8:30, concert, Westinghouse band, T. J. Yastine.
KFI, Los Angeles, Calif. (Pacific, 469), 5:30-6 p. m., Examiner news bulletins, Dr. Ralph L. Power; 6:15-8, dance orchestra; 8-9, Aeolian instrumental trio; 9-10, program from Examiner studio; 10-11, Packard Radio club; 11-12, Ambassador hotel Cocanut Grove orchestra.
KFKB, Milford, Kans. (Central, 286), 8-9 p. m., Abe Martin's band; 9-10, lecture, Dr. Osborne; male quartet; 10-11, lecture, Dr. Brinkley; Jubilee boys' orchestra.
KFNF, Shenandoah, Va. (Central, 266), 7:30 p. m., program, Harmony boys; 10:30, midnight frolic, Shenandoah branch.
KFSG, Los Angeles, Calif. (Pacific, 278), 3:30-4:30 p. m., Gray studio program featuring talented "tois" from children's church; 7:30-9:30, audiforium service, "divine healing," Alcee Semple McPherson; altar call; temple choir; Marlon McGlashen Muller, Salvation Army soprano.
KGO, Oakland, Calif. (Pacific, 312), 1-5:30 p. m., concert orchestra, Hotel St. Francis; 8, program, Merced Boys' band, auspices of the American Legion Post 83; 10-11 a. m., dance music, Henry Halstead's orchestra.
KGW, Portland, Oregon. (Pacific, 492), 10 p. m., dance music, George Olsen's Metronomallian orchestra.
KHJ, Los Angeles, Calif. (Pacific, 395), 12:30-1:15 p. m., concert; 2-3:30, matinee musicale; 6-6:30, Art Hickman's concert orchestra, Edward Fitzpatrick, director; 6:30-7:30, children's hour, "American History," Prof. Walter Sylvester Hertzog; silver-shoot juveniles; bedtime story, Uncle John; 8-10, program.

(Continued on page 14)

Friday, October 24

Silent night for: CKAC, KPO, WBBR, WFL, WMH, WOR, WRC, WSAI.
CKAC, Montreal, Can. (Eastern, 425), 1:15 p. m., Annual Royal hotel luncheon concert; 1:30, Ho Jossens.
CKNT, Toronto, Can. (Eastern, 400), 8 p. m., W. E. Howard Capps, tenor; Albert David, tenor; Charles Leslie, baritone; Alfred Atkinson, bass; Lillian Bull, pianist; Wendell Hall, Eveready Redhead; "Forests as a Basis of National Development," Elwood Wilson.
KOKA, E. Pittsburgh, Pa. (Eastern, 326), 7:30 a. m., free hand callisthenes, O. Shannon; 12:30 p. m., International Sunday School lesson, James J. Mace; 6:30, Winters Holston, organist; 7:15, Daddy Winkinn, Radio hymnster; 7:30, "The Constitution Convention," Charles H. Lewis; 8, feature; 8:15, "Football Coaching," Guy Williamson; 8:30, concert, Evan Lloyd, director, latent Edgard Thompson Steel works.
KFAE, Pullman, Wash. (Pacific, 330), 7:30 p. m., Phillips Beneficial, pianist; Iris McKeonolds, violinist; "Reduction in Potato Yields Due to Running Out," G.

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MAYOR OF BOSTON TO TALK AT WEEI; LIGHT OPERA AT WJZ SATURDAY

Where to Hear Concerts

Central Standard Time

THESE are the stations for music lovers to dial, and you can hear, providing you dial correctly and read the programs carefully, everything from jazz to opera.

Wednesday, October 22

6:30 WCAE, WMAQ, WCON, WGN, 6:45 WMAQ, WEAPE, WGN, 7:00 WMAQ, WCON, 7:15 WMAQ, WCON, 7:30 WMAQ, WCON, 7:45 WMAQ, WCON, 8:00 WMAQ, WCON, 8:15 WMAQ, WCON, 8:30 WMAQ, WCON, 8:45 WMAQ, WCON, 9:00 WMAQ, WCON, 9:15 WMAQ, WCON, 9:30 WMAQ, WCON, 9:45 WMAQ, WCON, 10:00 WMAQ, WCON, 10:15 WMAQ, WCON, 10:30 WMAQ, WCON, 10:45 WMAQ, WCON, 11:00 WMAQ, WCON, 11:15 WMAQ, WCON, 11:30 WMAQ, WCON, 11:45 WMAQ, WCON, 12:00 WMAQ, WCON.

Thursday, October 23

6:30 WCAE, WMAQ, WCON, WGN, 6:45 WMAQ, WEAPE, WGN, 7:00 WMAQ, WCON, 7:15 WMAQ, WCON, 7:30 WMAQ, WCON, 7:45 WMAQ, WCON, 8:00 WMAQ, WCON, 8:15 WMAQ, WCON, 8:30 WMAQ, WCON, 8:45 WMAQ, WCON, 9:00 WMAQ, WCON, 9:15 WMAQ, WCON, 9:30 WMAQ, WCON, 9:45 WMAQ, WCON, 10:00 WMAQ, WCON, 10:15 WMAQ, WCON, 10:30 WMAQ, WCON, 10:45 WMAQ, WCON, 11:00 WMAQ, WCON, 11:15 WMAQ, WCON, 11:30 WMAQ, WCON, 11:45 WMAQ, WCON, 12:00 WMAQ, WCON.

Friday, October 24

6:30 WCAE, WMAQ, WCON, WGN, 6:45 WMAQ, WEAPE, WGN, 7:00 WMAQ, WCON, 7:15 WMAQ, WCON, 7:30 WMAQ, WCON, 7:45 WMAQ, WCON, 8:00 WMAQ, WCON, 8:15 WMAQ, WCON, 8:30 WMAQ, WCON, 8:45 WMAQ, WCON, 9:00 WMAQ, WCON, 9:15 WMAQ, WCON, 9:30 WMAQ, WCON, 9:45 WMAQ, WCON, 10:00 WMAQ, WCON, 10:15 WMAQ, WCON, 10:30 WMAQ, WCON, 10:45 WMAQ, WCON, 11:00 WMAQ, WCON, 11:15 WMAQ, WCON, 11:30 WMAQ, WCON, 11:45 WMAQ, WCON, 12:00 WMAQ, WCON.

Wednesday, October 22

(Continued from page 11)

"Fain Hildebrandt," R. H. Hudson, 9:00 p. m. Boston. "The Gypsy Song," R. H. Hudson, 9:30 p. m. Boston. "The Gypsy Song," R. H. Hudson, 10:00 p. m. Boston. "The Gypsy Song," R. H. Hudson, 10:30 p. m. Boston. "The Gypsy Song," R. H. Hudson, 11:00 p. m. Boston. "The Gypsy Song," R. H. Hudson, 11:30 p. m. Boston. "The Gypsy Song," R. H. Hudson, 12:00 p. m. Boston.

Thursday, October 23

Silent night: KFAC, KOW, KGD, KSD, WDAE, KCAK, Montreal, Quebec, 4:30 p. m., 7:30 p. m., 10:30 p. m., 11:30 p. m.



The Gypsy string ensemble will entertain WJZ on a radio program each Monday evening.

Mae Dearborn Schwab is one of the popular soloists to be heard regularly when dialing KGW, Portland.

Where to Hear Talks

Central Standard Time

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

Wednesday, October 22

6:30 KOW, WCAE, WMAQ, WCON, WGN, 6:45 WMAQ, WEAPE, WGN, 7:00 WMAQ, WCON, 7:15 WMAQ, WCON, 7:30 WMAQ, WCON, 7:45 WMAQ, WCON, 8:00 WMAQ, WCON, 8:15 WMAQ, WCON, 8:30 WMAQ, WCON, 8:45 WMAQ, WCON, 9:00 WMAQ, WCON, 9:15 WMAQ, WCON, 9:30 WMAQ, WCON, 9:45 WMAQ, WCON, 10:00 WMAQ, WCON, 10:15 WMAQ, WCON, 10:30 WMAQ, WCON, 10:45 WMAQ, WCON, 11:00 WMAQ, WCON, 11:15 WMAQ, WCON, 11:30 WMAQ, WCON, 11:45 WMAQ, WCON, 12:00 WMAQ, WCON.

...; LIGHT OPERA AT WJZ SATURDAY

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Where to Hear Talks

Central Standard Time

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

KFKB,
KGW,
WJZ

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estra; 8,
Frances M.
Marx E. Obern-
Ottawa.
12:30 p. m.,
8:30, program,
midnight frolic.
6 p. m., story
1; 6:30, Creston,

2 m., chimes; 7
lin; 7-20, "The
Schools," Mrs.
James Simpson.
11 a. m., or-
m., Wananaker
Golden, director;
30, A. Candelori
Hotel Adelpia;
om Fox theater;
10:30, Vincent
chestra.
2:30-2:45 p. m.,
b Schafer; 3:15-
cent Buono, cor-
es; 7-7:15, Vin-

469), 3 p. m.,
women's wear;
20, "Beauty and
ent topics, editor
no recital; 3:50,
ecital; 6, stories

p. m., J. P. M.
; 10:45, Georgia

6:45-7:45 p. m.,
c reader; Sandy

a. m., setting-up
women's editor,
n; 3 p. m., De-
News orchestra.

er 25

WBAP, WCAV,
WLV, WOO.

p. m., kiddies'
Rex Battle and
estra; Napoleo
instrumental con-
J. A. Larriere,
ston St. Jacques;
out Royal hotel
linist.

126), 1:30 p. m.,
football game;
ard the Riddler;
; 7:45, World's
in C. Johnson; 8,
; 8:15, featuro;
J. Yastine.
D., 5:30-6 p. m.,
L. Power; 6:45-8,
hental trio; 9-10,
l, Packard Radio
it Grove orchestra,
8-9 p. m., Abe
born; male quar-
jubilee boys or-

6), 7:30 p. m.,
10:30, midnight

278), 3:30-4:30
ig talented "fois"
uditorium service,
McPherson; altar
en Muller, Salva-

, 1-5:30 p. m.,
els; 8, program,
American Legion
Henry Halstead's

, 10 p. m., danc
orchestra.
395), 12:30-1:15
musiate; 6-8:30,
dward Fitzpatrick,
"American His-
rtzag; silver-sheet
n; 8-10, program,
c 14)

Saturday, October 25

(Continued from page 13)

courtesy, Newberry Electric company, arranged by J. Howard Johnson; 10-11, Art Hickman's dance orchestra, Earl Burnett, director.

Wright and Bessinger; 10:30, Hotel Astor dance orchestra.

Sunday, October 26

Silent night for: CKAC, KFOA, KGW, KOB, WCAY, WDAF, WFL, WHAS, WOR, WRC, WTAY, WWJ.

Burris Jenkins, pastor; 8-9:15 p. m., evening services, representative church of Kansas City.

Monday, October 27

Silent night for: CKAC, KFNF, KHJ, KFSG, KYW, WEBB, WGN, WHAS, WIP, WJY, WLS, WMAQ, WTAY.

WHA, Iowa City, Ia. (Central, 484), 12:30-1 p. m., talk, Dr. Walter Fieseler.

Tuesday, October 28

Silent night for: KFAE, KOB, WFL, WGR, WHO, WKAC, Montreal, Can. (Eastern, 425), 7 p. m., kiddies' stories in French and English; 7:30, Rex Battle and his Mount Royal hotel concert; Rex Battle, pianist; 8:30, special; 10:30, Joseph C. Smith and his Mount Royal hotel dance orchestra.

(Continued on page 15)

Eight Tube Super-Heterodyne Receiver

Part III—The Panels and Shielding

By Harry J. Marx

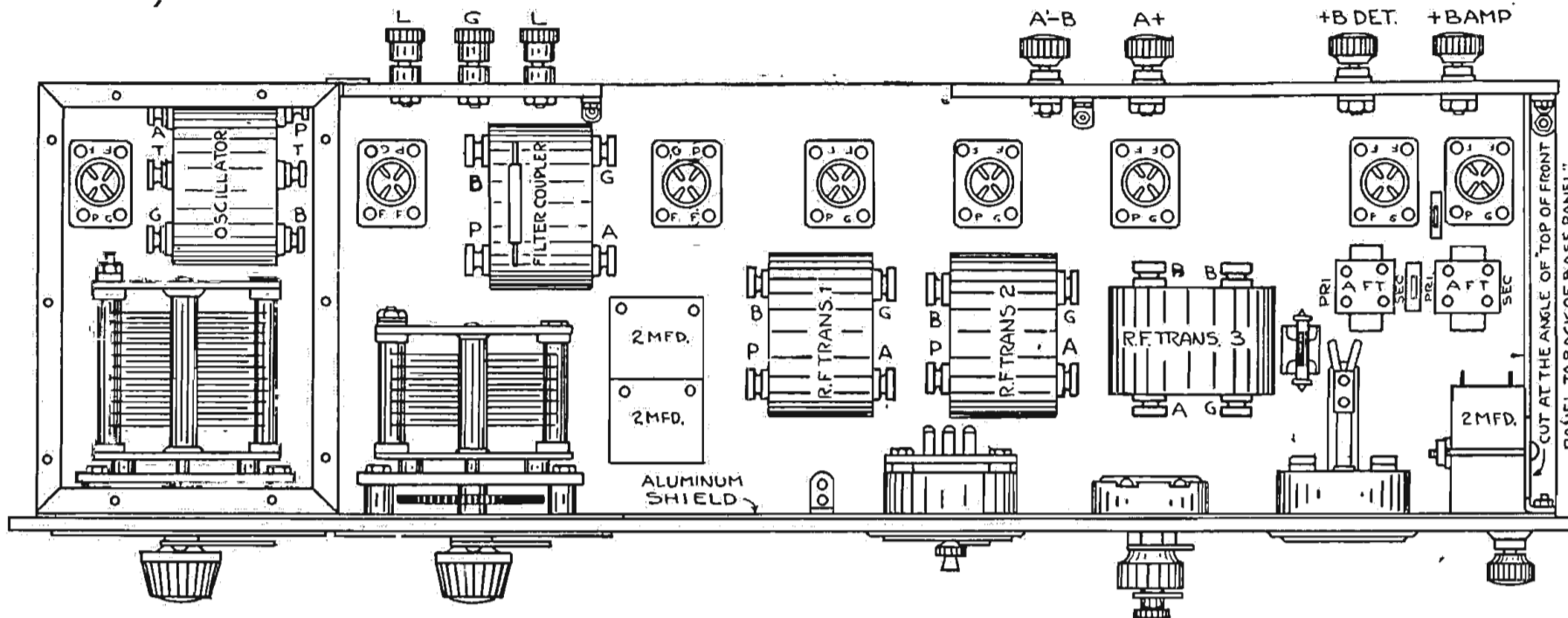


Figure 6

AFTER due examination of the circuits, the list of apparatus and the general appearance of the front of the set, the natural successive step is a peep at the rear of the front panel.

The plan view shown in Figure 6 shows very clearly the exact location of each piece of apparatus and just how the terminals face. This arrangement is recommended for its convenience in the proper wiring of the set. In this view, however, the wiring has been omitted in order to more clearly indicate the proper arrangement of apparatus.

It will be noticed that the oscillator coupler is completely isolated by shielding. The filter coupler is well out of the field of the long wave transformers. In addition, the last R. F. transformer (Number 3) is turned so as not to be affected by any possible field of the two audio transformers.

A fixed condenser is shown in its relative position over the filter coupler. Another is shown between the last two sockets and also between the two audio frequency transformers.

Two of the two microfarad condensers are shown between the .0005 mfd. variable condenser and the first R. F. transformer, while the third is shown in the lower right corner.

Value of Shielding

After becoming thoroughly acquainted with the arrangement of the apparatus on the panel and sub-panel, the panel and shielding details are more easily understood.

An important detail of the panel layouts is the necessity of shielding and the

protection it offers. The word protection is used because a shield has always been intended for this use, whether in pre-historic warfare or Radio set design.

In the development of the neutrodyne principle, there is illustrated the importance of the effects of even the minutest of capacity values. Capacity values of 5

even greater importance. When eight vacuum tubes are coupled together to form a receiving circuit the accumulative effects of stray coupling begin to assume serious importance and require much more attention for proper design and layout of the set and its circuit.

Shielding undoubtedly creates surplus

The entire isolation of the oscillator circuit keeps the effect of this local generator in that part of the circuit where it is intended to operate. There is no possibility of coupling to any other part of the circuit. The oscillator condenser has no varying capacity effects, outside of its rotating to fixed plate values, to make trouble in tuning, regardless of any other adjustments on the set.

The tuning condenser, likewise, cannot be effected by body capacity or the adjustment of the oscillator condenser.

Panel Layout and the Shield

The layout of the front panel is shown in Figure 7, while the shield is shown in Figure 9. The holes for the two meters and the jack must be enlarged so there will be no contact or short circuit to the shielding. The two binding post holes in lower right corner must also be enlarged on the shield as required by the posts used.

The holes for the condenser assemblies may be somewhat confusing, but this will be detailed later.

Where the A tube circuit is used provision will have to be made for the extra rheostat and the potentiometer. The centerline of the two meters should be continued to the left, likewise the centerline just below it. A vertical centerline should be drawn 3 3/4 inches to the left of the meter and battery switch line and

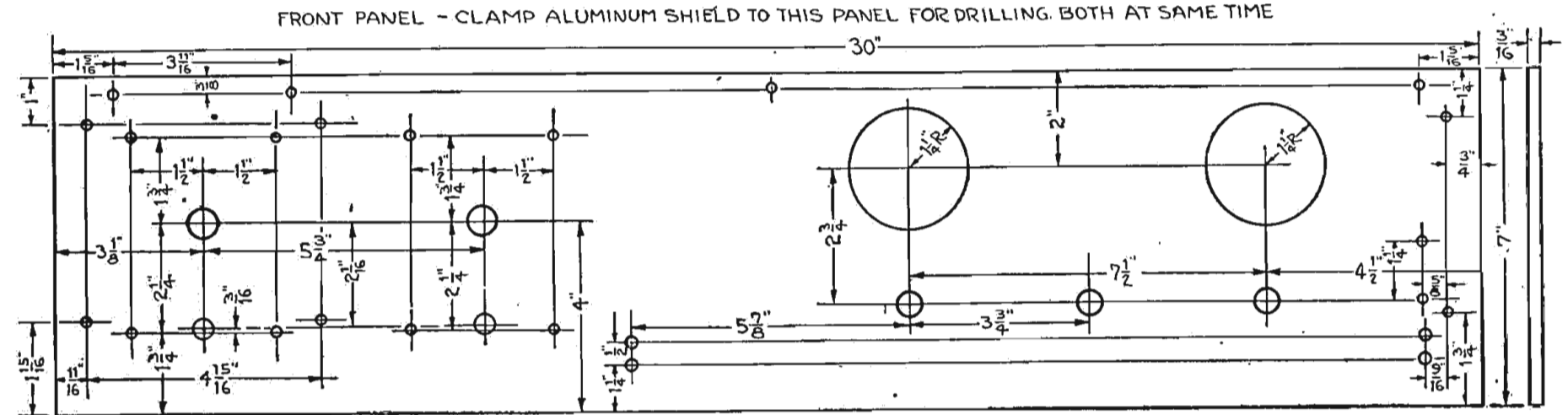


Figure 7

micromicrofarads are sufficient to control regeneration and to neutralize the coupling from tube to tube in Radio frequency stages.

This last reaction is of even more importance than is generally appreciated and recognized.

The entire elimination of stray coupling effects has been found desirable in all forms of tuned Radio frequency. In super-heterodyne circuits this assumes

capacities which in most cases act as by-passes and as a rule cut down the volume of reception. Where eight tubes are used this volume reduction becomes a sacrifice in exchange for selectivity, long range and clarity of reception. Efficient and properly designed audio frequency amplification can supply all the volume necessary.

intersecting the two extended centerlines. The top centerline locates the potentiometer and the extra rheostat is placed at the intersection below it.

Sub Panel and Shield

The view of the sub panel layout Figure 8 shows it from the lower side in order (Continued on page 20)

Effarsee Beats a Loop—

EFFARSEE Portable Antennae are so simple and easy to use they remove all the resistance to radio sales due to worry about aerials. They bring in stations 2,000 miles away in good weather. Reduce static, improve tone, increase selectivity.

Every set owner needs one for nights when static is bad. Used in series with an outside aerial, it stabilizes signals and improves the tone.

Effarsee costs little. Three sizes: \$1.00, \$1.50 and \$2.50. If your dealer can't supply you write direct.

Dealers, Jobbers and Manufacturers Agents: Effarsee is selling in volume. It will be a big thing in radio. Write for our proposition.



Hang it anywhere!
Greater Selectivity!
Better Tone!
Less Static!
Use Indoors or Outdoors!

Effarsee

PORTABLE ANTENNAE

The Fishwick Radio Co.
Edwards Bldg., Cincinnati, Ohio

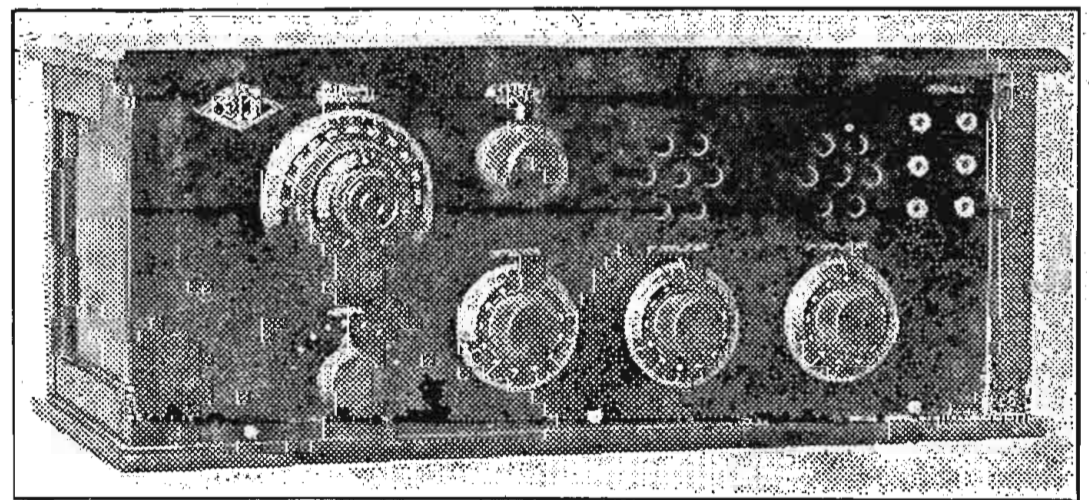
WE WANT EVERY RADIO FAN

in the United States and Canada to Know About

The New 1925 Model

Elgin Super-Reinartz

(The Ford of Radio)



The same circuit which copied 2LO, London, at two different times and places last season, but with the following improvements:

- EASIER ASSEMBLED**—No soldering
- EASIER TUNED**—One dial; stations may be logged. Regeneration varied without change in tuning.
- MORE SELECTIVE**—May be made extremely selective by setting aerial switch to the left.
- BETTER APPEARANCE**—Beautiful solid mahogany cabinet, with all wires brought through the back to a sub-panel. Mahogany finished, engraved panel.
- WIDER RANGE**—Tunes all stations between 150 and 750 meters.
- MORE COMPACT**—Three tube set six by fifteen inches.
- SHORT AERIAL**—May be used on a loop or single wire as short as ten feet with astonishing results.
- NO STORAGE BATTERY**—Very efficient with all dry battery tubes.
- UNUSUAL VOLUME**—Louder with one tube than most regenerative sets are with two.

NO HAND CAPACITY

CHEAPER IN PRICE

Discounts to recognized dealers only
Send a two cent stamp for a folder containing one, two and three bulb hook-ups and the price list of parts necessary to assemble this beautiful and wonderfully efficient circuit.

ELGIN RADIO SUPPLY CO. 207 E. CHICAGO ST., ELGIN, ILL.

Radio Digest

PROGRAMS
Illustrated

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Ruralist Much Benefitted

Isolated Families Brought in Touch with World

THERE is no question but what if receiving sets become in general use in farm houses that this will do more than any one thing to cure young people of restlessness and make them more content with life on the farm.

Good roads and the automobile have done much in this direction. Town is no longer a matter of once a week. It is within a short distance of the most isolated. With the advent of Radio the ruralist may be connected with the great centers and it brings home to them music, education, information and amusement everywhere.

Interconnection of Radio Stations

Urged by the Secretary in His Speech

SECRETARY HOOVER in his address at the opening session of the third national Radio conference urged the interconnection of Radio broadcasting as a daily routine. He further stated that local stations in all sections of the country should be able to handle every important event as a regular proposition.

"The local station must be able to bring to its listeners the greatest music and entertainment of the nation, but far beyond this, it must be able to deliver important pronouncements of public men, it must bring instantly to our people a hundred and one matters of national interest."

Profitable Adjustment to Music Trade

Radio Sets Find a Suitable Place in Music Store

THE dominating feature of Radio is music. This outstanding fact has become firmly established and is highly significant both to the music trade and to the general public.

There can no longer be any doubt but what the great majority of people, regardless of how much they may like certain other features of broadcast programs, rely upon music for the major item of their Radio diet.

A recent survey of the music trade disclosed that already 56 per cent of the dealers handle Radio, and that 28 per cent contemplate handling it at an early date.

The sale of Radio products is becoming the major factor in the music trade in proportion to the extent to which sound merchandising methods are established and service and allied problems solved.

The music trade will find in Radio a permanent and profitable adjunct to its other lines as it really serves the public in enabling it to enjoy the new act. There is no reason why there should not be as many Radio sets in American homes as there are telephones, talking machines, or automobiles. Today there are probably less than one-third as many.

The music trade is the most logical channel through which Radio can go to the people. With the right kind of co-operation between it and the Radio manufacturers, Radio should become the major line in every reputable music store in the land.

Two Kinds of Bugs

Now Comes a New Use for Radio

FRUIT growers have learned that with the use of Radio they can determine through the sense of hearing whether apples and other fruits are wormy. Through a series of experiments it has been found that bugs and worms can be detected by Radio. In the experiments a strong microphone was used in connection with the ordinary Radio transmitting set. Even the movement of the larvae of the apple worm could be detected. With the microphone and an apple placed in a box the worm could be distinctly heard nibbling the apple.

RADIO INDI-GEST

Radio—Explained!

A doodle-bug sat on a stand
Listenin' to a Radio Band—
"That's queer," he says, and looks at me,
"What's queer" says I, and looks to see.

"There ain't no horn, and ain't no drum—
From where does all this music come?"
"Danged if I know," I says to him
And turned around and asked Old Jim.

"I will explain it all to you,"
Says Jim—"And it's all due
To sound waves travelin' through the air
From here or there or anywhere."

"I see," says I, "but just which sound
Sends all these waves that here abound?
There's Puget Sound, and several more—"
And I named over three or four.

"Them's the ones!" exclaims Old Jim—
Which shows there's nothing wrong with him!
The Doodle-Bug looked up in joy:
"At last I now," he says, "O Boy!"
GEO. A. WRIGHT.

"Call for Texas!"

Dear Indi: Whassa matter with the Hired Hand? Is he getting feeble minded in his old age? He's pulled the same wise crack twice within a year. S. U. PER.

Quick, Watson, the Needle!

Dear Indi: I have a three tube set that brings in programs so loud that it jarred the ether out of the bottle and put the family to sleep. RADIO RAY.

Hear! Hear!

Ten thousand employees of the Heinz company dined and heard speeches simultaneously in 62 cities and four countries on October 11.—News Item.

The poets sing of King Arthur's ring,
Attended by knights far and near,
And tho the table was small
When they spoke in the hall
The knights on the end couldn't hear.

And they tell me it's so at all famous feasts;
The guys on the end of the spread
Holler, "Louder oh please,
How can we sit at ease
When we can't hear a half of what's said.

But not so the gang that makes pickles and beans—
Ten thousand they number in strength;
Yet they heard as they et
From a loud speaking set
Speeches ten hundred pages in length.

Not a word did they miss as they sat there
Anniversing the bean company's birth,
And they strained not their ears
As did Arthur's peers
No, they heard to the ends of the earth.
DR. PANGLOSS.

Mrs. Partington Speaks Out

Dear Indi: Miss Partington says she has done had some good Radioing enduring the past month, having heard a lot of politics talk as well as more refined programs such as the

BEHOLD! WHAT MODERN SURGERY HAS ACCOMPLISHED



Fearpo and Wills rasting match and Gene Tooney a coaching Young Stripling of Georgia how to get experience for hisself and more money for his Pa. She heard the Radio "Skycop" Secretary Hoover lecturing against the politics ownership of railroads and other utilities that would furnish a lot of good jobs to pass around to the boys when them happy days come. She also says she heard General Pershing's retirement farewells and Defense Day reports, and was wonderful surprised at the telephone service the General got, and says she wishes her telephone would git that way. She heard WTAM's birthday party, and says it was sure some party.

Bill Hays at KFKX was heard a broadcasting the Radio Digest first straw vote, for the which she done mailed him a applause card right prompt and grateful, asking him to thank all the voters for her especial thanking the 8 who voted for Foster and the Red Flag because they was only but 8 of them.

SIGNING OFF.

Short Circuits at WFBH

The first amateur night at Station WFBH held recently was so successful that it is planned to hold another in the near future.

Major Andrew White, in an informal visit to the station, was asked to step to the microphone by Don Short. He described Short as the inventor of the "Short Circuit."

The famous colored team of McCarthy and O'Brien were a howling success. One fan said: "Don't give them the book; please take 'em out and shoot them." Damon Runyon, the famous sports writer, called up and said he and a party of distinguished guests were listening in at his home and greatly enjoyed the program.

The program was brought to an unexpected finish at 1:45 by an amateur operator in the control room on the roof. An amateur started broadcasting a story about snakes that was a scream, and the operator trying to keep from laughing, shook with mirth so that he switched some controls and blew out one of the big transmitting tubes. INDI HIMSELF.

The Helping Hand



Condensed

By DIELECTRIC

While floundering around seeking for something brand new the call WAHG came in with the explanation that this stood for "wait and hear Grebe." If you have a station on a low wave with a good program, wait—you'll probably hear Grebe. One of their first treats was a talk from Dr. MacMillan. Musical programs from WAHG start well. Keep it up.

There is another station presenting orchestra music of an agreeable nature, WEBH, and you are never in doubt as to whom you are listening. They tell you, often. What is perplexing, however, is the trouble experienced in switching from studio to theater. The timing of this process seems a bit difficult for them to gauge properly. We'll keep an ear on them and note improvement in the future.

I respectfully commend to Station WNYC a studio location at a point to be selected by Captain Donald McMillan, in view of that scientist's observations in the Arctic circle. To deprive the mass of humanity from the educational advantage of discovering how to tune them out to get other near-metered stations would be the acme of selfishness. In the North one is heard all over the world. On the air (all) nightly!

Debates are beginning to figure again in the season's output of Radiocast material, and while there are sometimes dry "listening," the one WJZ put through mike was not; it was real wet. That captain of the Oxford team was a slick debater. He almost drove me to drink listening to his English modulation—and I was with the Columbia boys: DRY.

There is one musical instrument seldom heard these days, yet it admirably mikes, and that is the zither. In the hands of Carl Wunderle you slide back on the chair and register contentment. WLW was wise in coaxing this artist back to the studio in Cincinnati.

"A rousing time was had by all" at the World war convention banquet, which WBZ kindly gave to listeners in. The band sure did play like a military outfit, also the speeches were interesting to hear. Banquets always have a tang to them for the laughter of the banqueters makes you unlimber even at old jokes. Then, of course, there's always the chance to listen to prominent speakers at no cost to the R. I.

When KYW runs their late concerts you hear a grand mixture of up-to-the-minute stuff, most always. It didn't require the admonition of the announcer, "all right, Jack, run wild," to start a piano jazzing at full tilt, for the man at the ivories was about three stages ahead of the ordinary set of fingers all the time. There are no long pauses during these features, either.

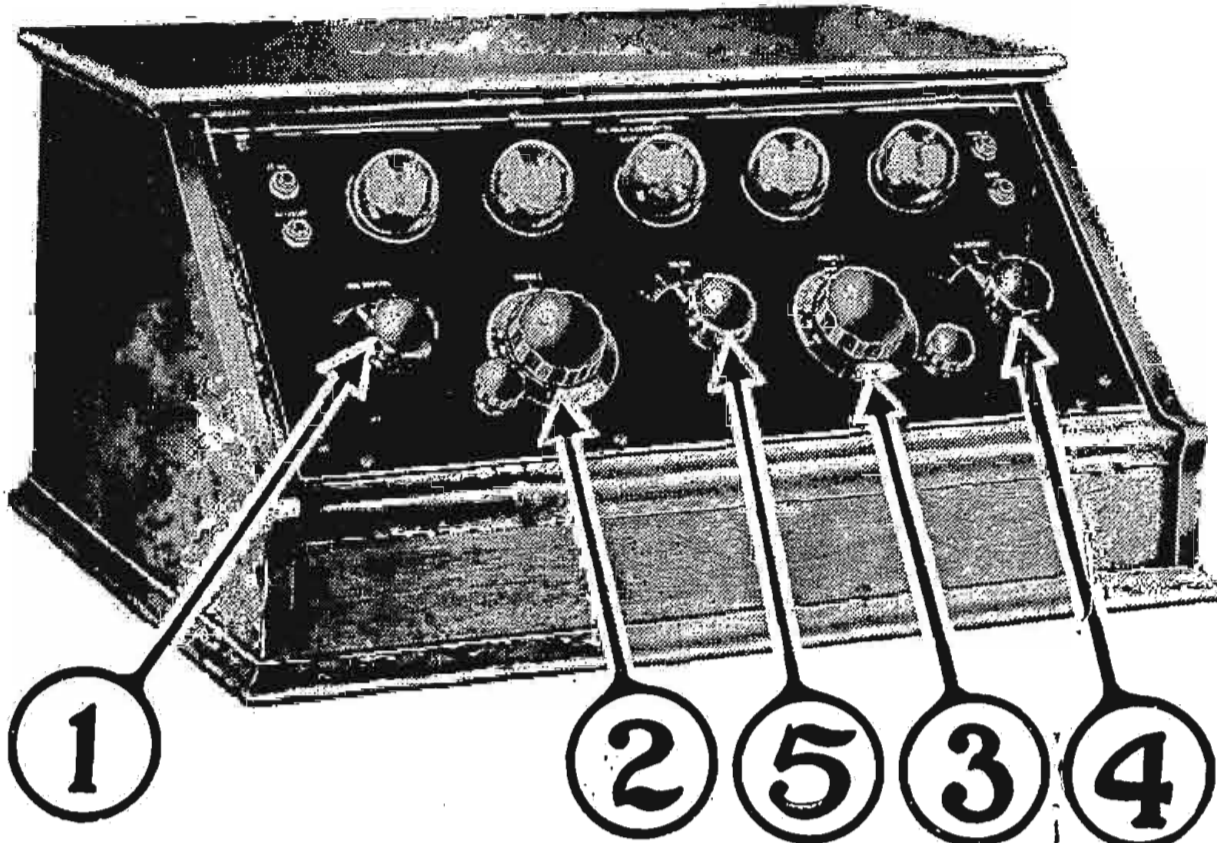
"Dug" Stanbury will be missed from the Sunday Capital programs. That fellow sang too well to stay out of grand opera forever, though we hope he will return to studio work when the opportunity affords. Roxie's gang fill a large place in the hearts of the war buddies, as also thousands of other listeners, and we want to keep them all.

Whenever WGY comes on the air with a Radario there is sure to be something worth tuning in. As good as any lately put on was the melodrama "Silence." The voices of the actors and actresses were entirely capable of putting over the stirring action, so much so that I wished the murder hadn't come to light. There were some real tense moments.

OPERATING AND TROUBLE SHOOTING

For the Owner of a Kennedy Model XV Receiver

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



KENNEDY engineers have long known that tuned Radio frequency amplification used in a Radio receiver would have two especially desirable advantages, namely, ability to pick up very weak signals and great selectivity. Many of the sets on the market today, embodying some variation of this system are, however, rather too complicated for the average person, as they require three principal controls for tuning-in stations. Long development and experimental work in the Kennedy factory finally produced in the Model XV a Radio receiver that anyone can operate regardless of whether he or she has ever operated a set of any kind before.

The controls necessary to tuning the Model XV have been reduced to a minimum and are so connected in the circuit that even though no previous instructions have been given or read anyone can tune in and receive different stations without one interfering with the other; something that can be done with few other five tube tuned Radio frequency receivers. The Model XV Kennedy set is truly a two-handed set; and uses but two tuning controls. These are always set about the same for any given stations; therefore, it is only necessary to log the settings for one dial in order to accurately record a definite station. This setting will always remain the same even though different antennas are used.

There are six principal features on the Model XV: the antenna is coupled to the

first Radio frequency tube and this coupling is variable, giving extreme selectivity when desired. Both stages of tuned Radio frequency amplification are controlled by one dial; the new Kennedy method of utilizing tuned Radio frequency enables the tubes to operate at maximum efficiency at all wave lengths and under all conditions. A jack is provided so that a loop antenna may be used; this makes the set a combination for either antenna and ground or loop. A control is provided so that volume may be regulated; this control is a coupling coil in the second step of Radio frequency and uses no current as is the case in many sets where a potentiometer is used for volume control. This receiver cannot be made to howl or squeal regardless of the tubes used or how the controls are operated. Model XV functions equally well on either dry cell or storage battery tubes, requiring no readjustment other than the insertion of adapters.

The set is constructed on a rugged aluminum frame minimizing the chance of anything getting out of alignment and causing trouble. It has the familiar Kennedy sloping panel, that makes for easy tuning, of polished black formica and engraved. Controls are symmetrically placed and the unit is mounted in a solid mahogany cabinet with piano finish.

The controls of the Kennedy receiver are: (1) Tube control; this is a rheostat that regulates the current supply to the filaments of all the tubes. (2) Antenna tuning condenser; this tunes the secondary circuit when operating with antenna and ground and tunes the loop when the loop plug is inserted in loop jack. (3) Radio frequency control, which tunes

two stages simultaneously. (4) Selectivity control, which makes it possible to adjust the set to fit local conditions and the antenna with which it is to be used. (5) Volume control that enables the user to bring the volume up to tremendous strength yet cannot cause the set to oscillate or radiate.

Space is provided within the cabinet for two forty-five volt batteries or four twenty-two volt units, and if dry cell tubes are used three additional 1½ volt cells can be housed inside without crowding. All binding posts are mounted on a Bakelite strip inside the cabinet and to the rear of the apparatus making them convenient to get at, yet out of sight.

Connecting the Receiver

First connect the antenna and ground to their proper binding posts, connect the positive and negative leads of the A battery, then the negative B battery lead, the 22½ volt positive B lead and

the 90 volt positive B lead. Now insert the plug connected to the loud speaker in the jack marked stage 2 and insert the tubes in the sockets. The order of the tubes is as follows, looking at the set from the front: the first tube socket at the left is the detector, the next is the second Radio frequency, the third is the first audio amplifier, the fourth is the first Radio frequency amplifier and last is the second audio amplifier.

Operation of the Set

To operate the set first turn the knob 1 to the right about three-quarters of its possible rotation and, if connections have been rightly made, the filaments of the tubes will light. Now place the knobs 4 and 5 at 1 on their respective scales, the left hand on dial 2 and right hand on dial 3. Turn both over slowly keeping them at approximately the same numbers on the dials. The better way to tune is to use the verniers; they are the little knobs at the right and left of the tuning dials 2 and 3. Just push them in lightly and turn. By accustoming oneself to using them instead of the larger dials one will develop and get a more sensitive "feel" and will not pass over distant stations while tuning.

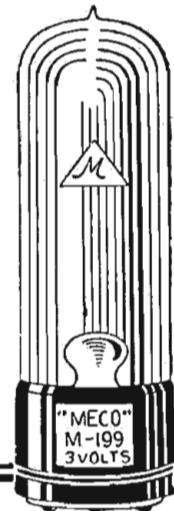
The first thing to do when using the Model XV is to get familiar with the controls and practice tuning out local stations. After carrier wave of a station has been picked up adjust the selectivity control by moving it to the right; as this control is moved, the station will get weaker so that dial 3 will have to be readjusted slightly either to the right or left. The selectivity control 4 has no effect on control 2 so it is not necessary to retune this control after it is once adjusted to its correct position.

The degree of selectivity attained by the operator of the set depends upon the adjusting of control 4; this should be made with great care, especially in the metropolitan districts where four or more powerful broadcasting stations may be operating at the same time. The Model XV will positively "go through" the locals and pick up distant stations, regardless of where the set may be.

Aerial Installation

To obtain best operation of this or any (Continued on page 18)

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TYPE M-199
3 Volt
"MECO"
Tube



Good News for Radiophans

Answering the demand for a high quality 3-volt radio tube with small base.

The same quality of workmanship and materials that has brought the recommendations of radiophans everywhere are used in manufacturing Type M. 199.

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Type M199 "Meco" tubes are to be had in either small or large base, thus eliminating adapters.

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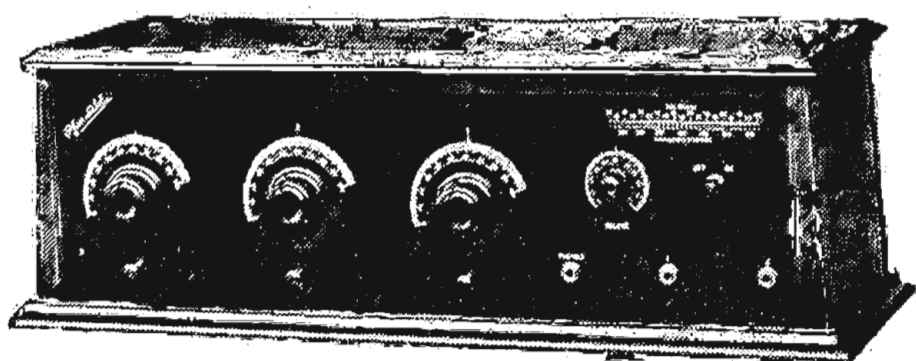
from among only a few of the better receivers. Consider among these the Pfanstiehl Model 7 receiver. You will always appreciate the suggestion.

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2. Extreme selectivity
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made possible by the Pfanstiehl Station Selector.

Your dealer will be pleased to demonstrate these features.

Pfanstiehl
Model 7
Receiver



PFANSTIEHL RADIO CO.

Highland Park

Illinois

Tuesday, October 28
(Continued from page 14)

bedtime stories; 7:50, "Both Sides of the Footlights," Arnold Abbott.
WEAF, New York, N. Y. (Eastern, 492), 11-11:15 a. m., board of education; 11:20-12, organ recital, Capitol theater; 12-12:10 p. m., motion picture forecast, Adele Woodard; 4-4:20, Josephine Whittell, soprano; 4:30-5:30, United Synagogue of America services; 6-7, dinner music, Waldorf-Astoria Hotel; 7-7:15, Robert Huntington, Terry, pianist; 8-8:20, "Tollies," Barnard college; 8:30-9; Gold Dust corporation; 10-11, National Carbon company.
WEAO, Columbus, Ohio (Eastern, 360), 9 a. m., music, Marguerite Mantel Siedel School of music talent; 11, music, Siedel artists; 1:30 p. m., music, Siedel artists.
WEBJ, New York, N. Y. (Eastern, 273), 7-7:30 p. m., Blyburn's review of the new photo plays on Broadway; 7:30-8:15, Doc Kobrin and his Master of harmony; 8:15-9, Rivoli ensemble under Dr. Hugo Riesenfeld.
WFJ, Philadelphia, Pa. (Eastern, 395), 1 p. m., Meyer Davis Bellevue Stratford concert orchestra; 3, closing prices, Chicago grain market; Caroline Hoffman, pianist; 6:30, Meyer Davis Bellevue Stratford concert orchestra; 7, Sunny Jim, the kiddies' pal.
WGN, Chicago, Ill. (Central, 370), 6-6:30 p. m., studio program; 6:30-7, 8-8:30, dinner concert; 8:30-9, Kathryn Snyder, reader; Norman G. Harte, baritone; Dick Hawkins, accompanist; 10-11, Jack Chapman's dance orchestra.
WGR, Buffalo, N. Y. (Eastern, 319), 12:30-1 p. m., George Albert Bouchard, organist; 2:30, Radio Dealers' program; 6, Halpryd string quartet.
WGY, Schenectady, N. Y. (Eastern, 380), 2 p. m., "Do You Intend to Vote?" Irene B. Taylor; 6:30, dinner music, trio from Hotel Ten Eyck; 7:45, "Yolls That Win Games," Hugh Fullerton; WGY orchestra; 8, "Enter Madame," WGY players; 11:20, organ recital, Stephen E. Botselair.
WHAA, Iowa City, Ia. (Central, 484), 12:30-1 p. m., "Sewage Disposal," Prof. Edward Bartow; 3, Mrs. Preston Coast, pipe organist; William G. Edmundson, tenor.
WHAS, Louisville, Ky. (Central, 400), 4-5 p. m., selections, Alamo theater orchestra; "Just Among Home Folks"; 7:30-9, concert, Happy Hoosier Harmonists.
WHB, Kansas City, Mo. (Central, 411), 2-3 p. m., ladies' hour program, Sweeney Radio trio; 8-9, program, H. A. Parker, baritone; Alherta Davis, reader; Helen Stohn, soprano; Aubrey Logan, violinist; Irma Young, pianist; Charles Gross, saxophonist, and Leona Robinson, pianist; 9-10, dance music, Sweeney Radio orchestra.
WHK, Cleveland, Ohio (Eastern, 283), 6 p. m., Marjorie Moore's Melodious Maids, Grebe's Rathskeller; sports, current news.
WIP, Philadelphia, Pa. (Eastern, 509), 1 p. m., Karl Bonawitz, organist; 3, talk, member of Coolidge Women's club of America; 6:05, Ehrenzeller's concert orchestra, George Ehrenzeller, director; 10:30, Harvey Marburger and his Vaudeville orchestra.
WJAX, Cleveland, Ohio (Eastern, 390), 7:30 p. m., program arranged by Cleveland News-Leader; E. G. Johnson, bedtime story; Don Palmer, Radio cartoon; 8, Tom Donohue's Bamboo Village orchestra; Isabel Boldon, soprano; Nora McNally, violinist; Joe Smith-Martha Lee club orchestra.
WJY, New York, N. Y. (Eastern, 405), 7:30-8 p. m., Orlando's Hotel Roosevelt orchestra; 8-10, "Enter Madame," WGY players direct from Schenectady.
WJZ, New York, N. Y. (Eastern, 455), 10 a. m., housewives league menu, Mrs. Julian Heath; 10:20, "Home Beautiful," Dorothy Ethel Walsh; 10:30, "Grace, Poise and Charm," Lillian Harrigan; 10:40, book review, Grace Isabel Colbron; 10:50, fashion talk, Eleanor Gunn; 1 p. m., Nathan Abas Hotel Pennsylvania orchestra; 4, Samuel Shankman, pianist; 4:30, Bernhard Levitov's Hotel Commodore orchestra; 7, "Dogs, West Highland White Terriers," Frank Dole; 7:15, Joseph Strissoff's Hotel Vanderbilt orchestra; 8:10, "Economics," Prof. Reid L. McClung; 9, talk, auspices of the National Republican committee; 9:15, Estey organ recital; 10, "Light to Live With," C. W. Mills; 10:15, Plaza theater's concert orchestra, Eugene Conte, director; 11, Reaux Arts entertainers.
WLW, Cincinnati, Ohio (Central, 423), 10 p. m., Ohio Rubber male quartet and instrumental trio; 11:30, Lange-McKay orchestra.
WMAQ, Chicago, Ill. (Central, 447.5), 4:10 p. m., lecture, Red Cross; 4:30, program, pupils of Glenn Dillard Gunn School of music; 6, Chicago theater organ recital; 6:30, Hotel LaSalle orchestra; 8, Harry Hansen, literary editor; 8:20, travel talk, Clara E. Laughlin; 8:40, talk, Association of commerce; 8:50, civil service commission talk; 9:15, program, Cosinopolitan School of music.

WMC, Memphis, Tenn. (Central, 500), 8:30 p. m., Charles Vanhooser; 11, Late Chlekasaw ramblers.
WDAW, Omaha, Nebr. (Central, 526), 6 p. m., advlc to lorelorn period, conducted by Cynthia Grey; 6:25, dinner program, transmitted from WOAW's studio in the May Seed & Nursery company bldg.; 3, program by courtesy of the Buckingham School for fretted instruments; 10:30, Vowel frolic, Frank W. Hodek, Jr. and his Omaha Nightingales.
WOO, Philadelphia, Pa. (Eastern, 509), 11 a. m., organ recital, Mary E. Vogt; 12:02 p. m., Wanamaker crystal tea room orchestra, Robert E. Golden, director; 5:15, organ recital, Mary E. Vogt.
WOR, Newark, N. J. (Eastern, 405), 2:30-3 p. m., Harry Olsen, banjoist; 3-3:15, Harry Olsen; 6:15-6:30, Clifford Lodge orchestra; 6:30-7, man in the moon stories; 7-7:15, Clifford Lodge orchestra; 7:15-7:30, sports talk.
WRC, Washington, D. C. (Eastern, 469), 6 p. m., children's hour; Peggy Albion; 8, Latin American night, auspices of the Pan American union.
WSAI, Cincinnati, Ohio (Central, 309), 7 p. m., Hotel Gibson orchestra, Robert Viscontini, director; 7:30, chimes concert; 7:45, bedtime stories, Ethel Knapp Behrman; 8, Gibson orchestra; 9, talk, "Management Week"; 9:10, mezzo-soprano solos, Charlotte Metzner; piano solos, Eleanor Wennig.
WSB, Atlanta, Ga. (Central, 429), 12 m., noon entertainment; 5:30, bedtime story, Bonnie Barnhardt; 8-9 p. m., Haydn Gunter, violinist; I. M. Mayer, pianist; John McCrindle, Scotch bass; 10:45, Raddiol frolic.
WTAY, Oak Park, Ill. (Central, 283), 6:45-7:45 p. m., Glenn Bueck, bedtime story; Sandy Meek, baritone; Raynor Dahlheim & company orchestra.
WWJ, Detroit, Mich. (Eastern, 517), 8 a. m., setting-up exercises, R. J. Horton; 9:30, talk, women's editor, Detroit News; 9:45, Fred Shaw, pianist and sonster; 12 m., musical program; 3 p. m., Detroit News orchestra; 7, Detroit News orchestra; Kaiman Feké, tenor.

Additional Programs
(Received Too Late for Classification)

Wednesday, October 22
WQJ, Chicago, Ill. (Central, 448), 11-12 m., "Sleeping for Health," P. E. Graft; "Thrill Is Not Miserliness," Mrs. Wilbur E. Fribley; 3-4 p. m., "Meat Substitute Dishes," Helen Harrington Downing; 7-8, dinner concert, Ralph Williams and his Rainbo Garden orchestra; Lilah Older Bell, reader; Maridene Borrison, baritone; Excelsior quartet; 10-2, Ralph Williams and his Rainbo Skylarks; Sandy Meek, Scotch tenor; The Melodians, Laurie, Eddie and Bennie; Clarence Theaders, tenor; George A. Little, Larry Shay, Harmony singers; Rita McFawn, soprano; Gust Hadstrom, pianist.
Thursday, October 23
WQJ, Chicago, Ill. (Central, 448), 11-12 m., "Selected Meats," Erna Bertram; "Choosing Winter Evening Wear," Eleanor Chambers; 3-4 p. m., "Timbale Battles-Timbales-When to Serve," Cora Beeman; "The Care of Canaries," L. J. Andruss; 7-8, dinner concert, Ralph Williams and his Rainbo Garden orchestra; Mrs. Lydia Lochner, contralto; Manual Rodriguez, Spanish tenor; Kathryn Snyder, reader; 10-2, Ralph Williams and his Rainbo Skylarks; Axel Christensen, pianologue; Grace Wilson, contralto; Hill, Klirsch, Gorny, Harmoning singers; Edna Solomon, contralto; Rosemary Hughes, soprano; Will Rosstler.
Friday, October 24
WQJ, Chicago, Ill. (Central, 448), 11-12 m., Fred Mann and his Sunday dinner; 3-4 p. m., "Your Hallo'een Party," Helen Harrington Downing; "The Land of Evangeline," Mrs. Harry T. Sanger; 7-8, Ralph Williams and his Rainbo Garden orchestra; Dorothe Schuber, Jugo Slav soprano; Arthur W. Ward, tenor; Harry Geise, pianist; Fred Jacobson, monologues; 10-2, Ralph Williams and his Rainbo Garden Skylarks;

Langdon brothers; Paul Lougher, tenor; Nubs Allen, contralto; Dorothy Rae "Around the Rainbo" company; Manual Rodriguez, Spanish tenor.

Saturday, October 25
WQJ, Chicago, Ill. (Central, 448), 11-12 m., "Pressure Cookers," H. F. West; "The Matter of Voting," Mrs. Thomas Oskar; 3-4 p. m., Coffee klatsch; 7-8, Otis Pike Jester, soprano; Mary House, pianist; William Molinaire, tenor; 10-2, Ralph Williams and his Rainbo Garden Skylarks; Jerry Sullivan; songs, George A. Little, Larry Shay; The Melodians, Laurie, Eddie, Bennie.

Sunday, October 26
WQJ, Chicago, Ill. (Central, 448), 10:30 a. m., Peoples church, Dr. Preston Bradley, pastor; Clarence Eddy, organist; 8-10, Ralph Williams Garden orchestra; Marlon Morgans; Lancaster Smith, bass; Mrs. Lancaster Smith, accompanist; Pearl Hechel, pianist.

Monday, October 27
WQJ, Chicago, Ill. (Central, 448), 11-12 m., "Winter Fashions and Fabrics for the Home Dressmaking," Marcia Meadows; "The Art of Hanging Pictures," George U. Gairing; 3-4 p. m., "Various Ways of Serving Potatoes," Helen H. Downing; "The Care of the Hair," Madame Huntingford.

Tuesday, October 28
KYW, Chicago, Ill. (Central, 536), 6:30 a. m., morning exercises, Y. M. C. A.; 11:35, table talk, Mrs. Anna J. Peterson; 2:35-4 p. m., afternoon frolic; 6:35-7, children's bedtime story, Uncle Bob; 7-7:30, dinner concert; 7:30-7:45, around the town with KYW in Chicago; 8-8:20, Chicago Musical college; 8:20-8:45, American Farm bureau; "The Monthly Analysis of Farm Markets," H. W. Moorhouse; "Trend of Live Stock Markets," 8:45-9:30, Chicago Musical college; 10-11:30, at home program.
WQJ, Chicago, Ill. (Central, 448), 11-12 m., "Skating for Everybody," Charles Kruse; "A Talk on Meat," Grace V. Gray; 3-4 p. m., "A Word About Breakfast," Cora Beeman; "The Romance of Aluminum," Peterson; talk, Col. Alexander Damon; 7-8, Ralph Williams and his Rainbo Garden Skylarks; James Mitchell, baritone; Marrie Boyd Mitchell, soprano; Carl Linner, pianist; 10-2, Ralph Williams and his Rainbo Garden Skylarks; Mary House, pianist; Otis Pike Jester, soprano; Paul Lougher, tenor; Nubs Allen, contralto; O'Flannigan and O'Hara, The Two Frenchman; Edna Solomon, contralto; Will Rosstler.

HOW TO OPERATE SET
(Continued from page 17)
receiver, an outdoor antenna suspended well above the ground should be used, its length not less than 50 feet nor more than 150 feet, if a single wire is used. Several wires supported by wooden cross-pieces, may, of course, be substituted for a single wire antenna, in which case it may be somewhat shorter than the dimensions given. All wires must be carefully insulated at the points of support by means of the commonly available antenna insulators. The part of the antenna known as the lead-in, which runs from the antenna proper to the receiving set, should be no longer than is necessary. Where it passes through the walls of the house, use should be made of some form of insulating tube, and wherever supported along the sides of the building, insulating cleats are necessary. Where it is impractical to erect a good outdoor antenna,

wires inside of the building can be substituted at but a slight loss of range. Such indoor antennas may be built by the use of wires strung around the room in which the receiver is located or in any space available, such as attics or hallways. It is recommended that such an antenna be located as far as possible above the set. In general it will be found that the indoor antenna will sacrifice something in the distance of reception as compared to that of an outdoor antenna. If no other type of antenna can be installed, the electric light or telephone wires may be found useful. In such cases, so-called socket antenna plugs are necessary.

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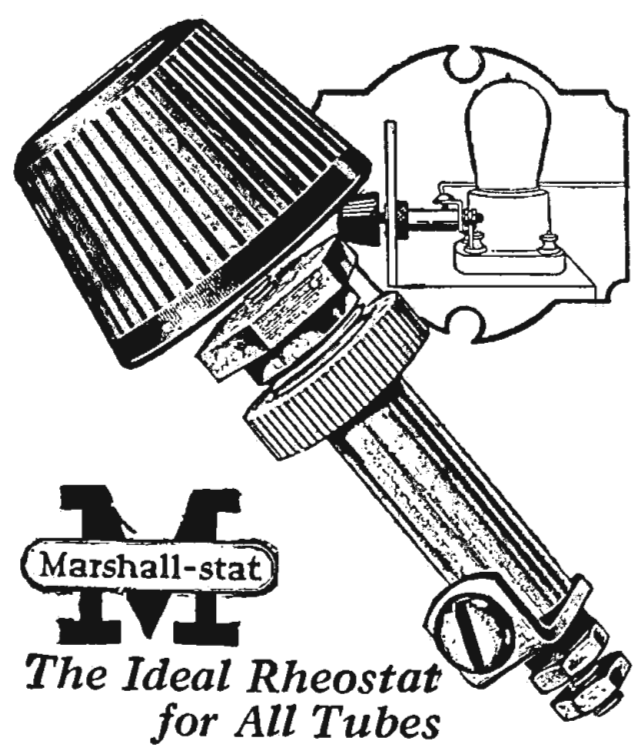
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The Marshall-stat provides vernier precision throughout its entire range. Yet there is only one knob to manipulate—no double adjustment to make.

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Send for Old Man Ohm's descriptive folder on the Marshall-stat.

The kind of Letters Thordarson-gets No. 3

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DONALD H. MIX
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New York City, Sept. 25, 1924.
 Thordarson Electric Mfg. Co.,
 500 W. Huron St.,
 Chicago, Ill.

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 The transformers which you supplied to equip the Radio on the schooner Bowdoin stood the extreme temperature of the Arctic without the slightest mishap. These transformers are in exactly the same condition today as they were the day they were installed, May, 1923.

Sincerely yours,
 (Signed) Donald H. Mix
 W.M.P.

THORDARSON
 Super
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Helpful Hints to Get the Most from Radio

Chapter VI—Crystal and Tube Detectors

By Thomas W. Benson

IN THIS series of articles set operation will be told in so simple a manner that the uninitiated can follow instructions and get the most out of reception, whether or not he knows anything about electricity or its application to broadcasting and reception. The series consists of thirteen chapters, of which the six next will be:

- Chapter VII—Sockets and Rheostats.
- Chapter VIII—Grid Leaks and Biasing.
- Chapter IX—Jacks and Switches.
- Chapter X—Amplifying the Signals.
- Chapter XI—Care of Radio Batteries.
- Chapter XII—Telephone and Loud Speakers.

THE elimination of losses in tuners results in more marked improvement in operation when a crystal is used as a detector. In the crystal set the energy to actuate the phones must be picked up by the aerial for no local battery is used as in tube sets. For that reason it is vital that every particle of energy be saved that good results be assured. A crystal receiver should employ a tuned aerial circuit and the tuner be of the close coupled type. Many crystal receivers employ the single circuit tuner as shown in Figure 13 at A but this circuit is not the best for the purpose. A much better circuit that will give more selectivity and range is shown at B in the same illustration.

Tuning Inductance

In the single circuit tuner the aerial is included as the capacity in the oscillating circuit. The best constructed aerial is a high loss condenser because of its resistance and the fact that various masses are located between the active plates. We saw how dielectrics increased losses in condensers in the last chapter and this fact enters into consideration here. In the second case, B, we have a tuned aerial circuit but a second circuit exists consisting of a portion of the tuning inductance and a small variable condenser. This circuit has lower losses and the current can increase to a maximum value and give improved operation. Old timers will recognize this as the double slide tuning coil.

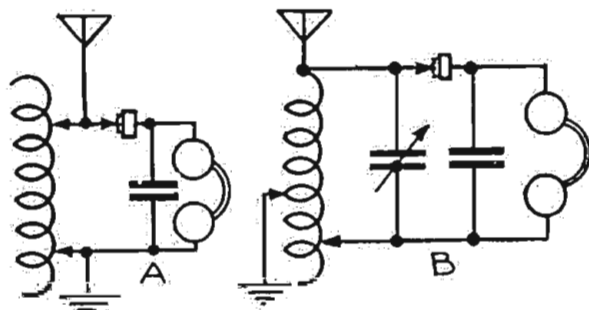


Figure 13—Two basic crystal detector circuits, one of the single circuit type, the other double circuit.

Assuming that the suggestions pre-

viously given have been followed in the selection of the tuning elements we need only concern ourselves with the detecting device at this time. There are a number of different substances that have the property of converting the high frequency Radio currents into the lower frequency audio currents to operate the phones. Of these but a few remain in common use, iron pyrites, galena and a synthetic crystal consisting of lead sulphide. Galena is a natural formation of lead sulphide. Of these galena is the most

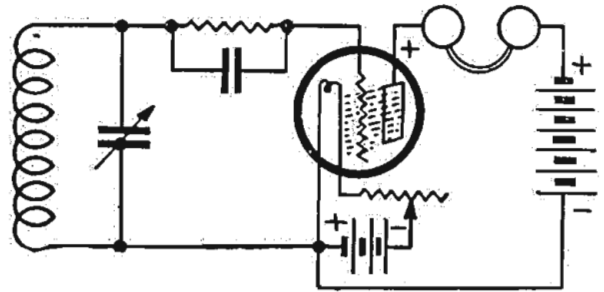


Figure 14—Elementary detector circuit to show action of tube detector.

sensitive but it must be a good piece and the contact used must be very light.

A very low percentage of galena is suitable for use in Radio work and the majority of detector stands are not designed to use it properly and for that reason it does not show up in practice as good as iron pyrites which requires a heavier contact. When one is willing to fuss with the detector for DX reception galena is the best; where stability and ease of adjustment is most important the iron pyrites should be selected.

Fixed Crystal Detectors

The so called fixed detectors are simply a crystal of iron pyrites with a catwhisker fixed on a sensitive spot. They are very satisfactory for reflex work but are not as sensitive as the adjustable type of detector. A crystal detector should always be enclosed to protect it from moisture and dust. The catwhisker should be clean and it is well to snip off a piece of the wire occasionally to bring a fresh surface into use. The detector should preferably be mounted on a cushioned support to prevent slight jars from knocking it out of adjustment.

Another factor in the operation of crystal sets that is often overlooked is the condenser across the telephones. Any old condenser seems to give results but it is well worth the time and trouble taken in selecting the proper size condenser. The exact action of the crystal detector is still a matter of dispute but the fact remains that a modulated Radio frequency current flowing through it gives rise to a current having the same wave shape as the voice currents impressed on the Radio currents at the broadcaster.

This audio frequency current charges

the phone condenser and the potential across it varies with changes in the wave shape. Therefore any losses in the condenser reduce this potential. Use only mica dielectric condensers and experiment for capacity. Some sets work best with just the capacity of the phone cords, others with different size condensers, it all depends on the phones used.

Vacuum Tube as a Detector

The operation of a tube detector is much more complicated and requires the adjustment of several factors for best results. Let us consider briefly just what occurs in a tube detector. In Figure 14 we have the elementary circuit of a detector tube with accessories. When the current from the A battery flows through the filament, heating it, the filament throws off electrons which are small charges of negative electricity. The amount of electrons thrown off increases as the filament temperature increases. The plate, being charged positive by the B battery attracts these electrons and a current flow in the plate circuit results. Thus we see there is a current flowing in the plate circuit of the tube all the time the filament is lighted.

The tuned input circuit is connected to the filament and to the grid through a small fixed condenser which has a grid leak connected across it. Let us assume that an incoming Radio wave induces an alternating current in the tuned circuit. At the instant the top of the coil is positive a positive charge will be placed on the grid. The grid being positive will also attract electrons which are absorbed. When the current flow reverses the electrons are trapped on the grid because it is insulated from the rest of the circuit by the condenser dielectric. The condenser can pass the high frequency currents freely but the negative charges from the electrons cannot flow through the condenser but act to charge it. Thus each time the grid is made positive it attracts more electrons till it accumulates a comparatively large negative charge.

When the negative charge increases on the grid it acts to repel the negative electrons from the filament and keep them from reaching the plate, thus reducing the plate current. Were no leak across the grid condenser the grid charge would build up till the plate current would be shut off entirely and the tube would block.

Grid Leak Across Condenser

The grid leak across the condenser is made of such a value that the negative charges are drained off slowly so the

grid never becomes highly negative but the negative charge on the grid will vary with the amplitude of the Radio frequency waves as controlled by the voice frequencies at the transmitter. Thus the grid potential varies in step with the voice waves and thus changes the plate current to reproduce the voice current wave. Since a slight change in grid potential gives a very much greater change in plate current an amplification effect is obtained accounting for louder signals being obtained from a tube than from a crystal detector. Since it is grid potentials or voltage that actuate the tube we must be careful to obtain as high a potential as possible at the grid. Low loss tuners function to this end but in addition the lead to the grid must be made as short as possible and run in the air. The grid condenser should have

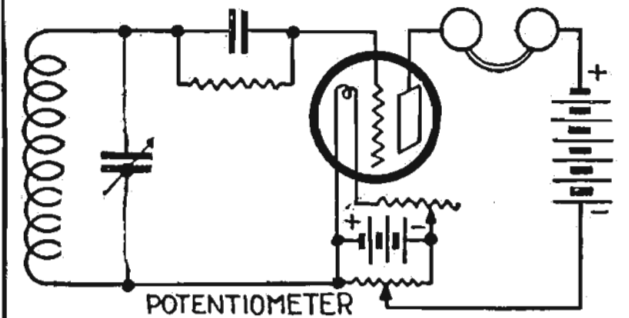


Figure 15—Circuit for tube detector using potentiometer to give accurate control of plate voltage.

a mica dielectric but an even better arrangement would be to use an air dielectric condenser at this point. The standard practice seems to be the use of a .00025 mfd. condenser as a grid condenser but many fans have found it worth their while to experiment a little with lower capacity condensers.

When it is possible to obtain a really good variable grid leak such experimenting is not really necessary because the proper operation of the tube demands only a relation between the leak and condenser which permits of the highest grid voltages being obtained with an accurate

(Continued on page 20)

Have you your EKKO Broadcasting Station Stamp Album?

Here's what every radio fan has wanted—a convenient, permanent and authentic means of recording all stations heard over your set. The Ekko Album contains spaces for a stamp from each of more than 650 stations. These stamps are verified and prove your reception of the station.

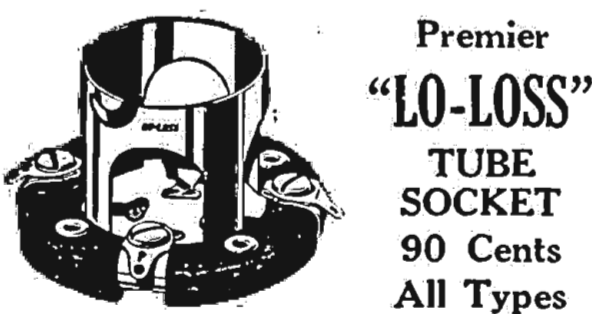
Proof of Reception cards are furnished with the album. Send the card to the station, together with ten cents, to cover cost of verification, give facts which prove you have heard their broadcasting. In return they send you their verified stamp as evidence of actual reception. The stamps are beautifully engraved in different colors, an individual stamp for every station showing the call letters.

The album is 9 1/2 x 11 inches, handsomely bound in a two color cover. It contains 96 pages, with spaces for stamps of all recognized stations arranged alphabetically by states and call letters. Also an alphabetical list of the official names and other interesting features of stations, as well as a convenient log.

See your dealer today, get a copy of the Ekko Album and start a collection of these stamps. You will find this a new and fascinating method of verifying the stations you hear. If your dealer cannot supply you, send direct on receipt of price. Money back if not satisfied.

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Premier Quality Radio Parts

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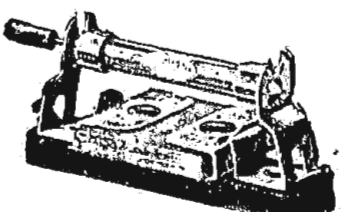
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10-25-24

SUPER-HETERODYNE

(Continued from page 15)

The nine holes on the right side are to properly indicate the counter-sinking of holes wherever necessary.

Figure 6 is shown a brace for mounting the sub panel and its shield to the front panel and shield. This has been detailed in Figure 11. The dotted lines indicate where to bend the flanges after the piece has been cut.

In the lower right hand corner of this Figure 12 is shown the details of two sets of 2 each, brass strips which are used for fastening the top plate of the box for closing up the metallic shield. The lower detail with the ends turned

GET MOST FROM RADIO

(Continued from page 19)

leak adjustment that just keeps the tube below the point of loading or blocking. Many sets use a hard tube as a detector. Such tubes are not critical as to filament adjustment and usually give somewhat louder signals than the soft detector tubes. But one must not confuse loud signals with sensitivity. The soft tube is unquestionably the most sensitive detector but it requires more careful adjustment to obtain the best results. A soft tube does not require as high a plate voltage to obtain a given plate current, hence small changes in plate voltage cause a noticeable change in the electron emission in the tube. For that reason an accurate control of plate voltage increases the efficiency of the detector. An excellent method of controlling plate voltage is to use a potentiometer across the A battery as shown in Figure 15.

A soft tube is likewise critical as to filament adjustment and methods of controlling the filament temperatures will be discussed later in the series. The small tubes using dry batteries for filament current are all hard tubes and not very critical as to plate voltage or filament brilliancy. Here some sacrifice is made to obtain simplicity of control and stability of operation. The grid return of a detector tube goes to the A battery.

(When using a tube for a detector it is necessary to have a socket and a rheostat for controlling the current. A description of these devices will be given in the next issue.—Editor's Note.)

BASE PANEL - CLAMP ALUMINUM SHIELD TO THIS PANEL FOR DRILLING BOTH AT SAME TIME

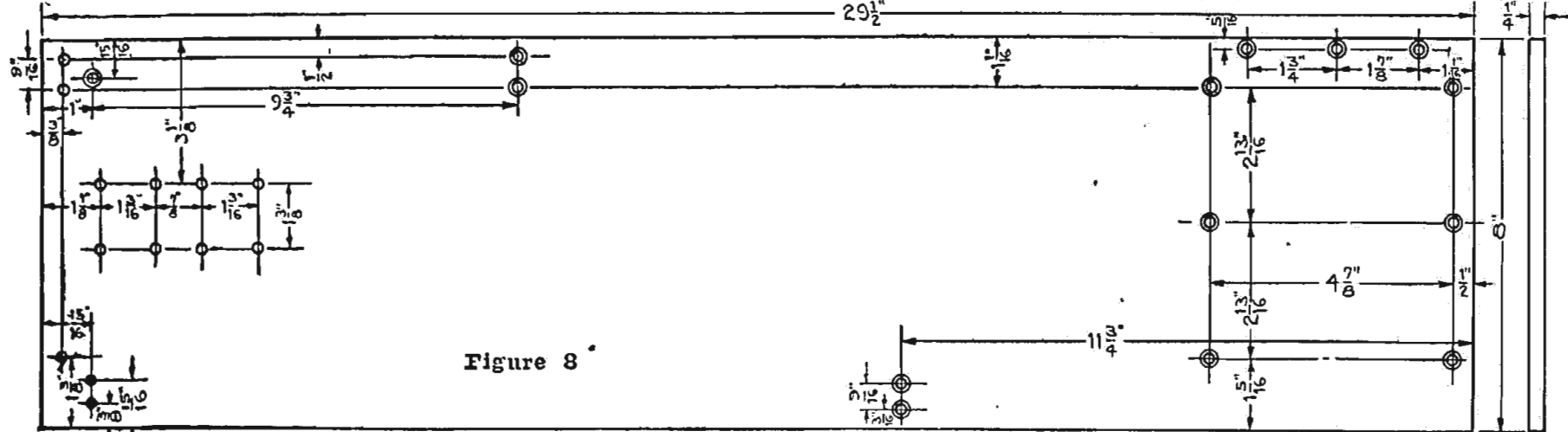


Figure 8

for the oscillator shield box shown on the left side of the plan view of Figure 6.

The eight holes on the left are for the audio transformer mountings. The location or arrangements of the remaining ap-

The drilled holes, when the flanges are bent, must be in alignment with the holes on the front and sub panels.

The two sets of holes at the rear end of the bottom flange take care of a small

down are slipped on the under side of the top flanges of the side pieces. A hole is drilled in each turned down end so when placed on the under side of the flange both are held in place by the top screws at the front and rear flange of these side pieces. Brass nuts (6-32) are soldered to the strip as indicated.

1/16" ALUMINUM SHIELD FOR FRONT PANEL, CLAMP TO PANEL FOR DRILLING

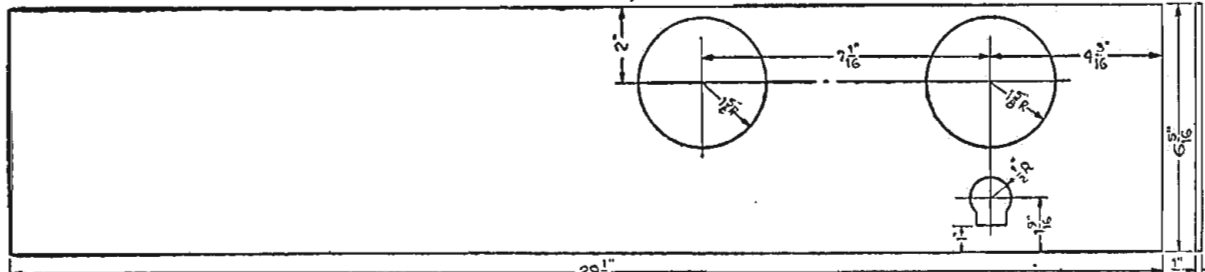


Figure 9

1/16" ALUMINUM SHIELD FOR BASE PANEL, CLAMP TO PANEL FOR DRILLING

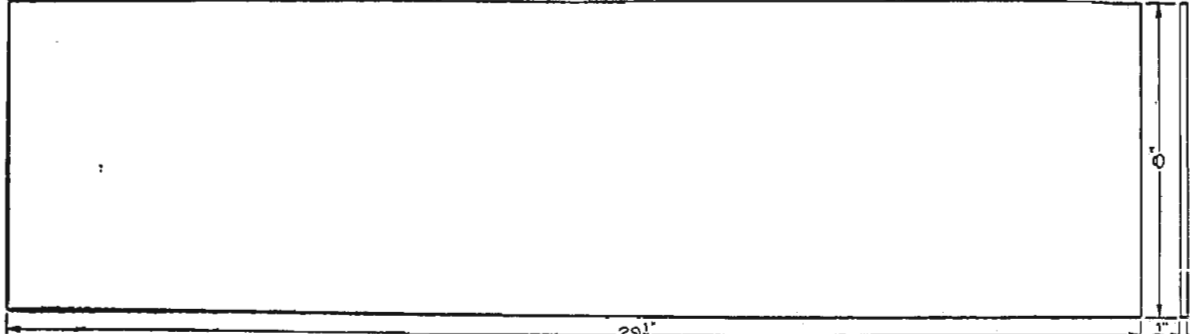


Figure 10

paratus is indicated in Figure 6, but no dimensions can be given due to the variations of the apparatus in the various

angle bracket which is used to support the right hand binding post strip shown in Figure 6.

The other strips do not have the ends turned down but simply slide into place under the front and rear angle strips but resting on the side brass strips.

When the top is placed in position, round head machine screws (6-32) coming through the holes in the top and the flanges of the front rear and sides, lug-gage the nuts soldered to the brass strips and permit securing the top firmly in place with good electrical contact and positive closed shielding effects.

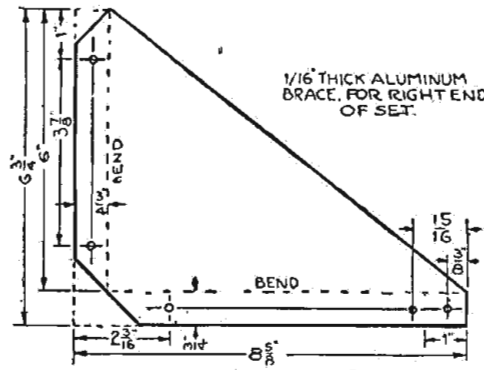


Figure 11

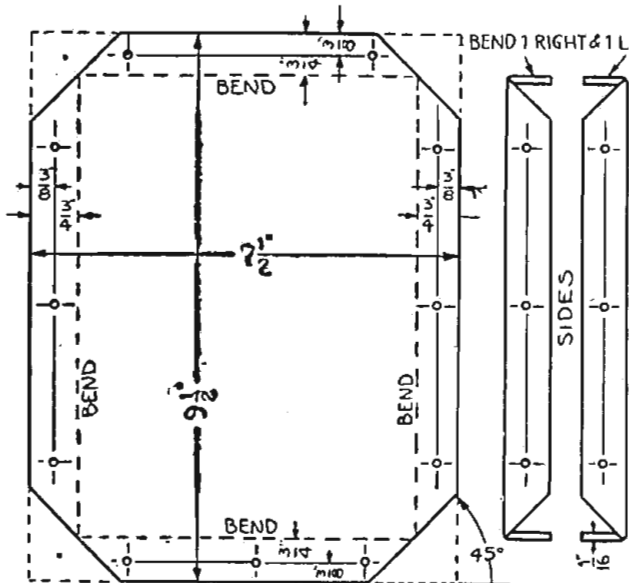
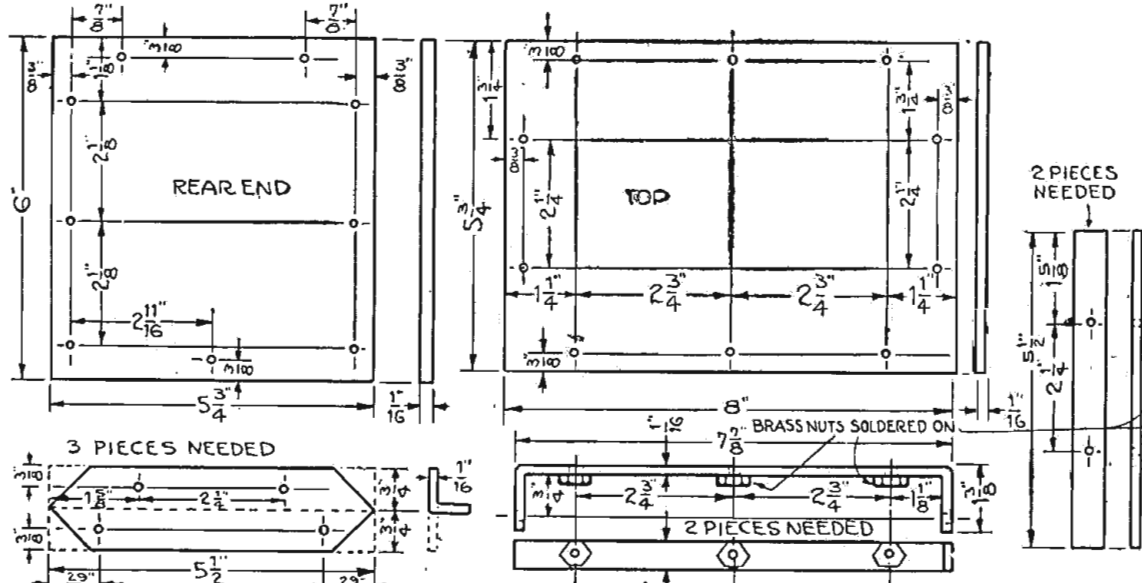


Figure 12



Oscillator Shield

The metal box which encloses the oscillator circuit has been detailed in Figure 12.

The two sides, right and left hand, are first indicated. Then the rear end and the top are indicated. Three small right angle strips are required.

kits available. Any parts used must be placed and marking made for them.

The dimensions of the aluminum shield which is on the upper side of the sub panel are shown in Figure 10. This piece should be clamped to the sub panel and all holes drilled through both simultaneously.

On the right side of the plan view illus-

(In the final article on the super-heterodyne, Mr. Marx will tell the best way to operate the set, wiring connections for the parts and other valuable information for those owning a similar set.—Editor's Note.)

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As this crystal is a new one put out by an old firm in the crystal business your dealer may not have it, but try to get him to order one for you, on our money back guarantee. If he does not wish to do so send us his name with a \$1.00 bill at our risk, and we will send you one with the understanding that you may return it, and we will refund you the \$1.00 at any time within 30 days. Gold Cat Whisker in Each Package

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As a regular reader of the Radio Digest for more than a year, and a tinkerer with the Miloplex and other circuits described in your columns; it gives me

WORKSHOP KINKS EARN A DOLLAR—

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

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

pleasure to submit you a hook-up that seems to involve possibilities in the regenerative field that the Armstrong patent does not cover.

My understanding of the Armstrong patent is that it has to do with inductive feedback regeneration, while it is quite possible that capacity feedback regeneration might be a strong feature.

I am using the following hook-up very satisfactorily, though I cannot recommend it for distance as yet. It works exceedingly well for clarity and volume, and is without erratic tendencies.—E. N. Baldwin, Donora, Pa.

Don't use more than one standard block plate battery (22.5 volts) on the plate of a UV-200 detector tube.

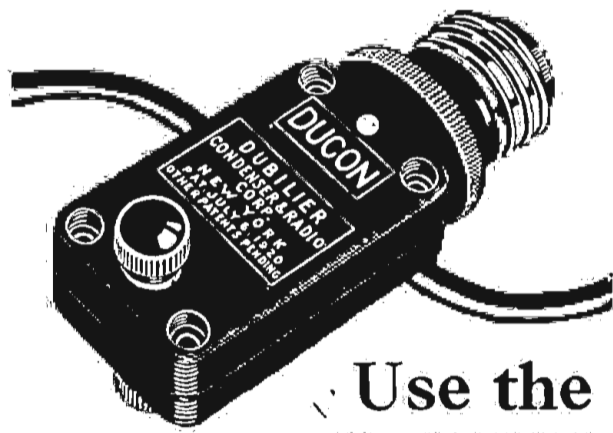
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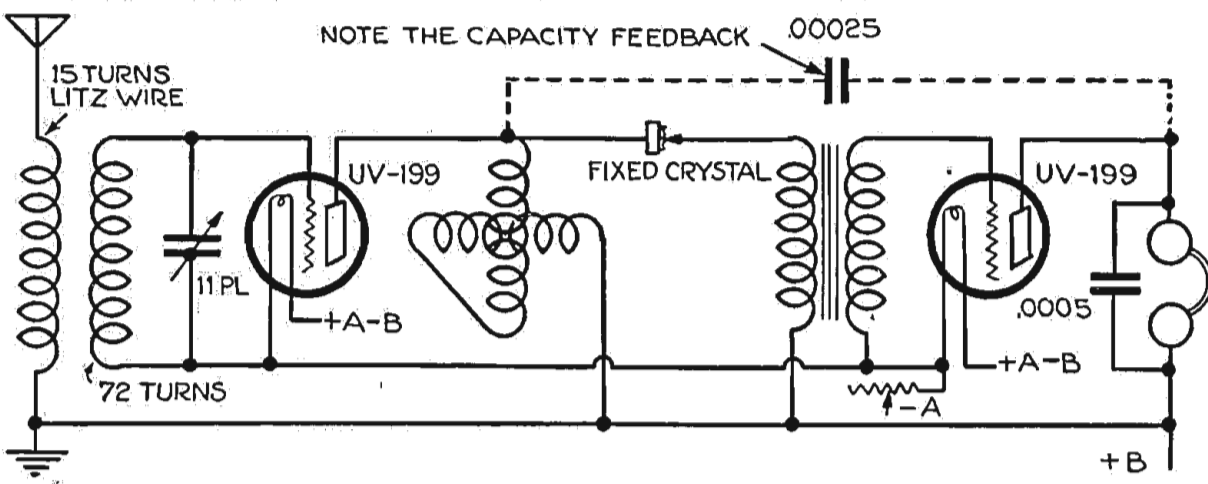
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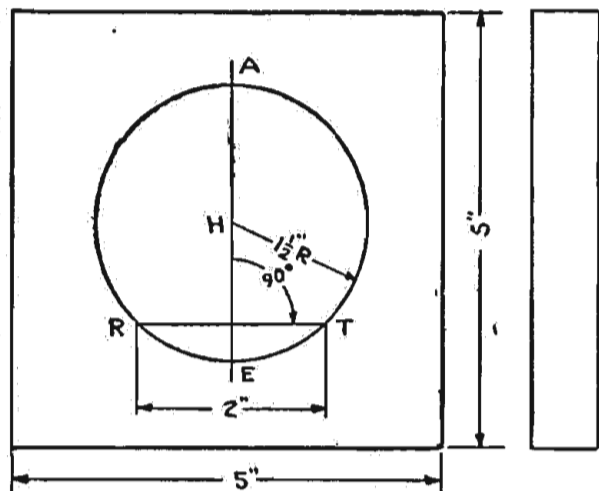
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HOOK-UP FOR DX RECEIVING



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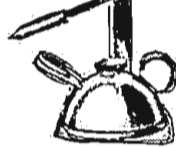
stator part as well. This can be easily done in the following manner: Procure a block of wood 5 inches square and 1/2 inch thick and locate the center. Take the board's center H and a radius HE equal to about 1/2 inch and describe a circle with a pair of compasses. Draw the cord

RT equal to about 2 inches, then construct a perpendicular bisector of this cord AE, which will pass through the center H. Where the cord RT cuts the circumference of the circle drive in two phonograph needles. To find the place where the rod should pass through a coil, place it against the needles and the line AE will indicate where the rod is to pass through. To a student of geometry the principle is evident.—A. C. Piepkorn, Milwaukee, Wis.

Battery Connections

Weak batteries should not be connected together with strong batteries in any combinations. Either in the series or the parallel arrangement the weak ones will be a drain upon the strong ones. In the series arrangement the strong batteries must force their current through the high resistance of the weak ones in the chain, and in the parallel arrangement the strong ones are apt to discharge their current through the weak ones.

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You know how essential good soldering is to the working of your set. A "Jiffy" Blow Torch will give you a real professional job. Self-blowing—absolutely safe! "Jiffy" complete outfit, Copper Soldering Iron, String Solder, "Jiffy" Non-corrosive Flux and "Jiffy" Blow Torch with accessories, \$2.50.

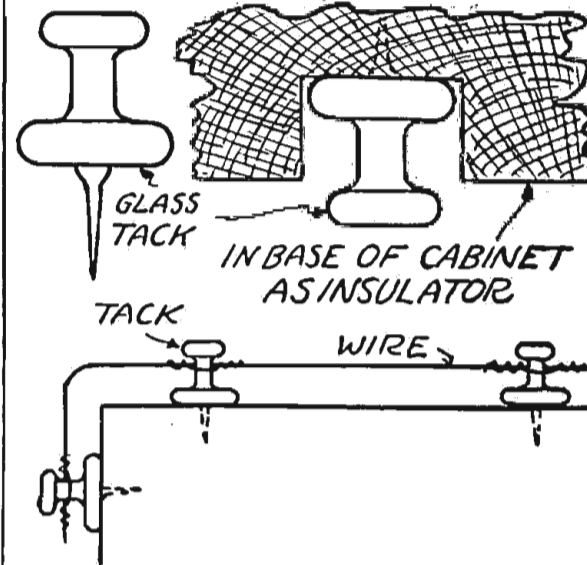
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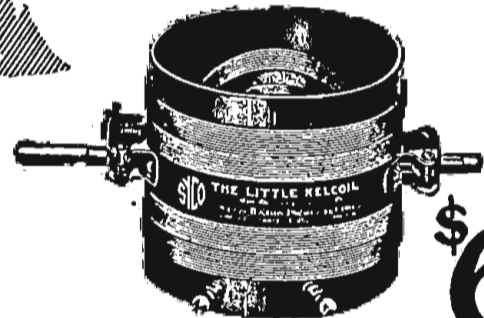
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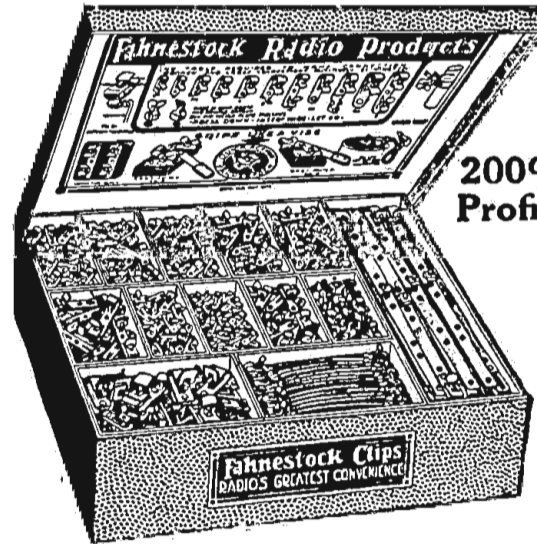
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Questions and Answers

Selectivity

(OS112) MJG, Sabetha, Kans.
I would like to ask a question in regard to question (05517) in issue of March 8th. You say there are many efficient circuits that will entirely eliminate interference of this nature. Will you please name some of the circuits that will do this? I have had three different Radio sets the past year. I have been trying to get one that would eliminate interference, but have not got one yet that will get it all out.

A.—We are advising in your inquiry that a large measure of selectivity of circuits with inherent attributes is sacrificed by unskillful operation, and it may be admitted as truism that "no circuit or receiver is better than its operator." The statement is not made with any personal reference but merely to illustrate the embarrassment of giving assurance that any particular type will do this or that. We can do no more nor less than to say that

a certain circuit has "inherent" selectivity. Whether or not that will be realized invariably is another matter.

The neodyne receiver is notable for its general effectiveness, its quiet operation and quality and range of reception. In favorable construction and operation there is undoubtedly a minimum of man-made interference.

Only One Station

(S407) WK, Hopkins, Mich.
Why is it that when several local stations are broadcasting together the only one I get clearly and without howling and whistling noises is WEA? The set I use is a three-tube regenerative with

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Since 1921
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100% GUARANTEED
Point Number One ONE PIECE STATOR
Eliminates broken contacts and soldered joints. Positive results; no leakage. Found in new types—Numbers 3 and 4, celeron end plates; 5 and 6, low loss—metal end plates.
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an aerial 100 feet long made of spring wire and used indoors.

If my set is not correctly constructed why does WEA? come in clean as a bell and the other stations cause whistles, howls, squawks and distortion? I have had several experts inspect my set and they pronounced it O. K. as to proper set up and construction.

A.—It would be impossible to determine from insufficient details offered if any factor in your receiver is responsible for limitations encountered.

The One Best Circuit

FOR 199 TUBES \$1.00
Super Selective-DX-Great Volume
2 Controls—Simple to operate—Easy to build. Operates on long, medium or short aerial. Results of 2 years work—Pick of 1,000 circuits. The best circuit properly balanced for 199 tubes. Complete Blueprints and details for 1-2-3 tube sets.
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808 Washington Blvd. Chicago

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ACME FEDERAL COLUMBIA FROST DAVEN PREMIER ERLA SHAMROCK BARRET & PADEN BREMER-TULLY
and Other Standard Lines
PRAIRIE STATE RADIO CO.
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Pages 10 and 11

of the Shamrock Booklet tell you how to build the
Ideal D X
Mail coupon today for the Shamrock booklet telling you how to build this inexpensive set and nine others. Full directions simply told.
SHAMROCK
FOR SELECTIVE TUNING
SHAMROCK MANUFACTURING CO., Dept. 24B Market St., Newark, N. J.
I enclose 10 cents (U. S. stamps or coin) for copy of "Shamrock Radio Builders' Guide Book," containing diagrams and complete instructions for building 10 inexpensive sets.
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Address.....
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However, we are of the opinion that improper tuning and unfamiliarity with characteristics of operation are acting as a deterrent to realization of inherent ability of circuit. Finding one's way in the ether is not merely a matter of turning knobs and requires considerable patience and observation before it is accomplished with ease.

A few tips from some one who is familiar with the underlying principles by practical demonstration will be helpful and desirable.

Men to build radio sets for me in spare time. Leon Lambert, 501-H Kaufman Bldg., Wichita, Kansas.

YOUR CRYSTAL SET

will work 400 to 1,000 miles if made by my plans. No tubes or batteries. Copyrighted plans \$1.00. Satisfied customers everywhere. Particulars free.
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Demonstrate once—results mean sure sale. Coast to Coast, lowest prices, attractive four tube instrument \$39.50. Big commission to you. Exclusive territory to proven salesman. Territory going fast. Write today for large illustrated book No. 100. Don't fail to give name of your county.
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D-201 A, D-200, D-199, D-12 in standard sizes to fit any socket. The internationally famous
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Three **DUTCH RADIO VALVES** (any type) will be sent for \$6.50 plus postage.
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FOR ANY CIRCUIT IN ANY SET YOU CAN'T BEAT THE DUTCH!

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A radio socket wrench that fits every round and hexagon radio nut
How it works
Place socket of required size on end of shaft with slots not in line with lugs on shaft.
Buy it from your dealer or direct from us
THE PERRY-FAY COMPANY Elyria, Ohio
Screw Machine Products

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Corrected Every Week—Part II

FIND MISTAKES AND YOU'LL GET DOLLAR

ONE DOLLAR will be paid to the Radiophone reader of Radio Digest submitting the most errors in any one station's listing in the Directory of Radiophone Stations...

(Note—The second part of the schedule list appears below. The first appeared last week.) KFNJ, Paso Robles, Calif. 240 meters. 10 watts. Radio Broadcast Assn. Announcer, Early W. Moore, Slogan, "The Home of the Nut." Mon, 8-10 pm, music. Pacific.

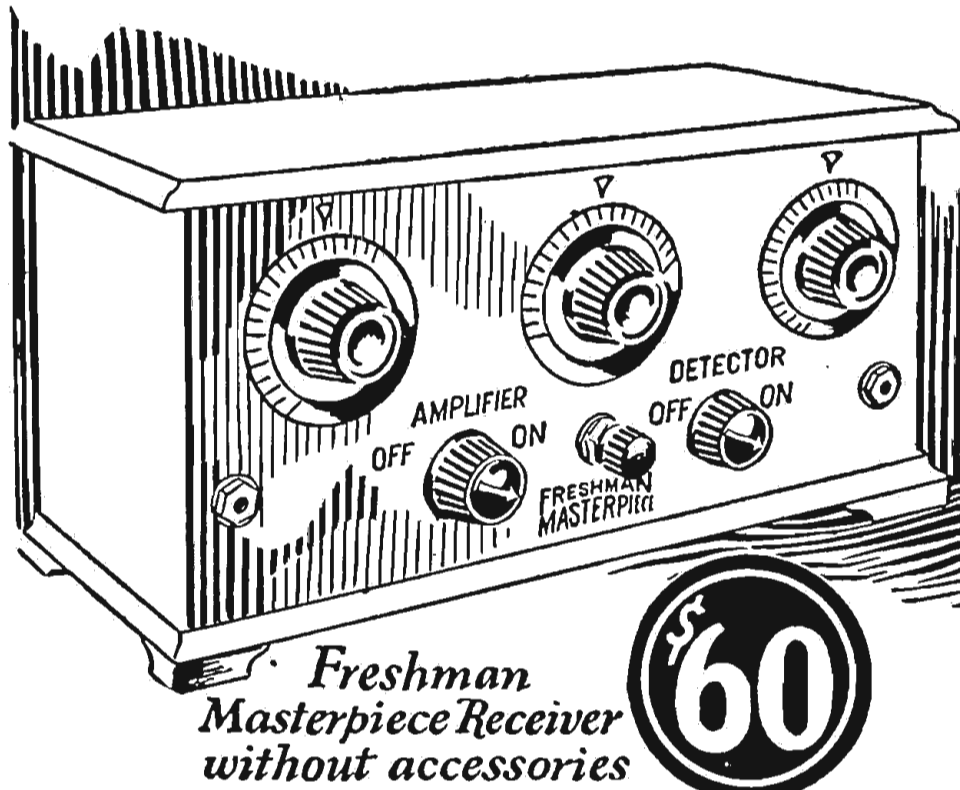
Harbour Longmire So. Temporarily off the air. KFQK, Fayette, Mo. 236 meters. 10 watts. Democrat Leader. KFQL, Muskogee, Okla. 252 meters. 20 watts. Oklahoma Free State Fair Assn. Announcer, Burle R. Jones. Slogan, "Our Gates Stand Open." Mon, Wed, Fri, 8-9 pm, music. Central.

"The Home of the Hood River Apple." Fri, 6:30 pm, music. Wed, 9 pm, special. Pacific. KQV, Pittsburgh, Pa. 270 meters. 500 watts. Double-day-Hill Elec. Co. Daily ex Sun, 11-11:30 am; 1-1:30 pm. Mon, Tues, Wed, Thurs, Fri, 3:15-3:45 pm, 4:30 pm, music, twilight tales. Mon, Wed, Fri, 9-10, concert. Eastern.

WBAO, Decatur, Ill. 275 meters. 50 watts. James Millikin Univ. University activities. No definite schedule. WBAP, Fort Worth, Tex. 476 meters. 750 watts. Fort Worth Star-Telegram. Announcer, "The Hired Hand" Club, "Radio Truth League." Daily ex Sun, 10, 11, 12 m. pm, 2 market reports, weather; 6-6:15, "Port of Missing Men." 6:30, concert. Tues, Wed, Thurs, Fri, 7:30-8:30 pm, 9:30-10:45, concert. Sat, 7 pm, Bible lesson. Sun, 11 am, church; 4 pm, concert. Central.

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No Neutralizing or Balancing Condensers Required

When you build with the Masterpiece Kit which produces a tuned Radio Frequency Receiver that will bring in even the most distant stations with the volume and clarity of locals. So selective that stations can be brought in day after day at the same dial settings. A set that will be the equal, if not the superior, of any 5 tube receiver on the market, and what's more, it's the easiest set in the world to operate.

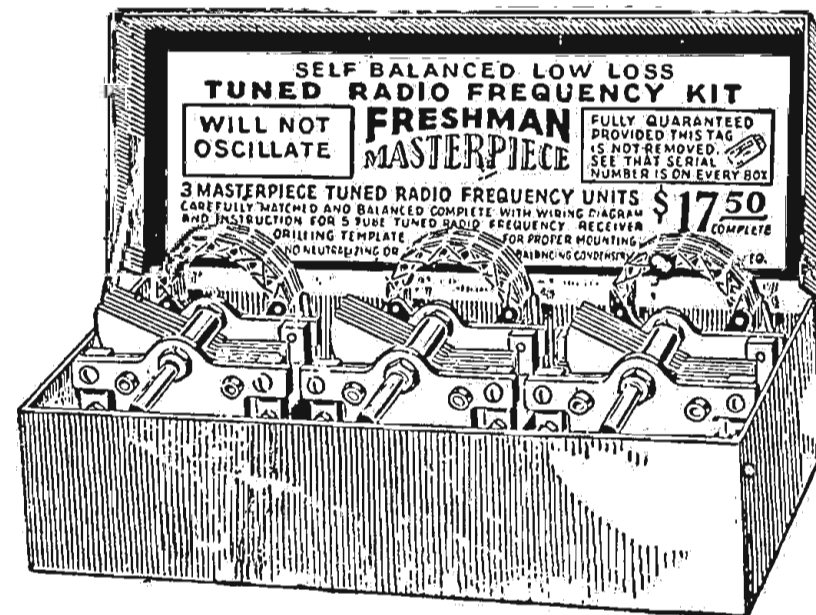
Each and every Freshman Masterpiece Coil bears a serial number and trade mark—our guarantee of electrical and mechanical perfection. Every genuine Freshman Coil is made of specially insulated wire to prevent short-circuiting, so often caused by inferior coils. For your protection demand only the genuine.

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